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UMTRA Project

Moab UMTRA Project Groundwater and Surface Water Monitoring Report January through June 2019

Revision 0

November 2019

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DOE-EM/GJTAC3024

Moab UMTRA Project
Groundwater and Surface Water Monitoring Report January through June 2019

Revision 0

Review and Approval

11/27/2019

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Revision History

Revision	Date	Reason for Revision
0	November 2019	Initial issue.

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Acronyms and Abbreviations

bgs	below ground surface
CCB	continuing calibration blank
CCV	continuing calibration verification
CF	Configuration
CFR	Code of Federal Regulations
cm	centimeter
COC	chain-of-custody
CRI	reporting limit verification
DOE	U.S. Department of Energy
EB	equipment blank
EDD	electronic data deliverable
EPA	U.S. Environmental Protection Agency
ft	feet or foot
gal	gallons
ICP	inductively coupled plasma
ICV	initial calibration verification
IDL	instrument detection limit
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
µmhos	micro ohms
MB	method blank
MDL	method detection limit
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
QC	quality control
r^2	correlation coefficient
RIN	report identification number
RL	reporting limit
RPD	relative percent difference
SD	serial dilution
SDG	sample data group
U	uranium
UMTRA	Uranium Mill Tailings Remedial Action

1.0 Introduction

1.1 Purpose

The purpose of this semi-annual report is to summarize the results associated with groundwater and surface water samples collected from the U.S. Department of Energy (DOE) Moab Uranium Mill Tailings Remedial Action (UMTRA) Project site during the first half of 2019. The results of the data validation process are also presented.

Four sampling events were completed during this time frame. The first event included the collection of samples from the Configuration (CF) 4 monitoring wells in January 2019. These locations are shown on Figure 1. The second event was associated with the Crescent Junction well 0205 sampling in March 2019 (Figure 2) as part of the quarterly monitoring for the first quarter of 2019. A third event was completed in April 2019, with samples collected from CF4 monitoring wells and CF5 extraction wells.

The fourth event started in May and was completed in June 2019. In this event, samples were collected from a variety of site-wide groundwater and surface water locations. Groundwater and surface water sampling locations are shown on Figures 3 and 4, respectively. Site-wide groundwater sampling was conducted to assess any changes and trends in water quality. The surface water samples associated with this event were collected to assess surface water quality adjacent to the site compared to upstream and downstream water quality.

1.2 Scope

This report 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 Surface Water/Groundwater Sampling and Analysis Plan* (DOE-EM/GJTAC1830). All data validation follows criteria in the *Moab UMTRA Project Standard Practice for Validation of Laboratory Data* (DOE-EM/GJTAC1855).

Appendix A includes the Water Sampling Field Activities Verification, Water Quality Data, Water Level Data, and the trip report associated with the January 2019 CF4 sampling event. Appendices B, C, and D provide similar information plus the Minimums and Maximums Report for the March 2019 Crescent Junction, the April CF4 and CF5, and the May/June 2019 site-wide sampling events, respectively.

Appendix D also includes the data associated with the trip blank collected during the May/June 2019 site-wide event. All Colorado River flows discussed in this document were measured from the U.S. Geological Survey Cisco gaging station number 09180500. River elevation data were collected adjacent to the site. The Minimums and Maximums Reports were generated (by the MESa database) to determine if the applicable data were within a normal statistical range.

The new data set was compared to the historical data to determine if the new data fall outside the historical 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.

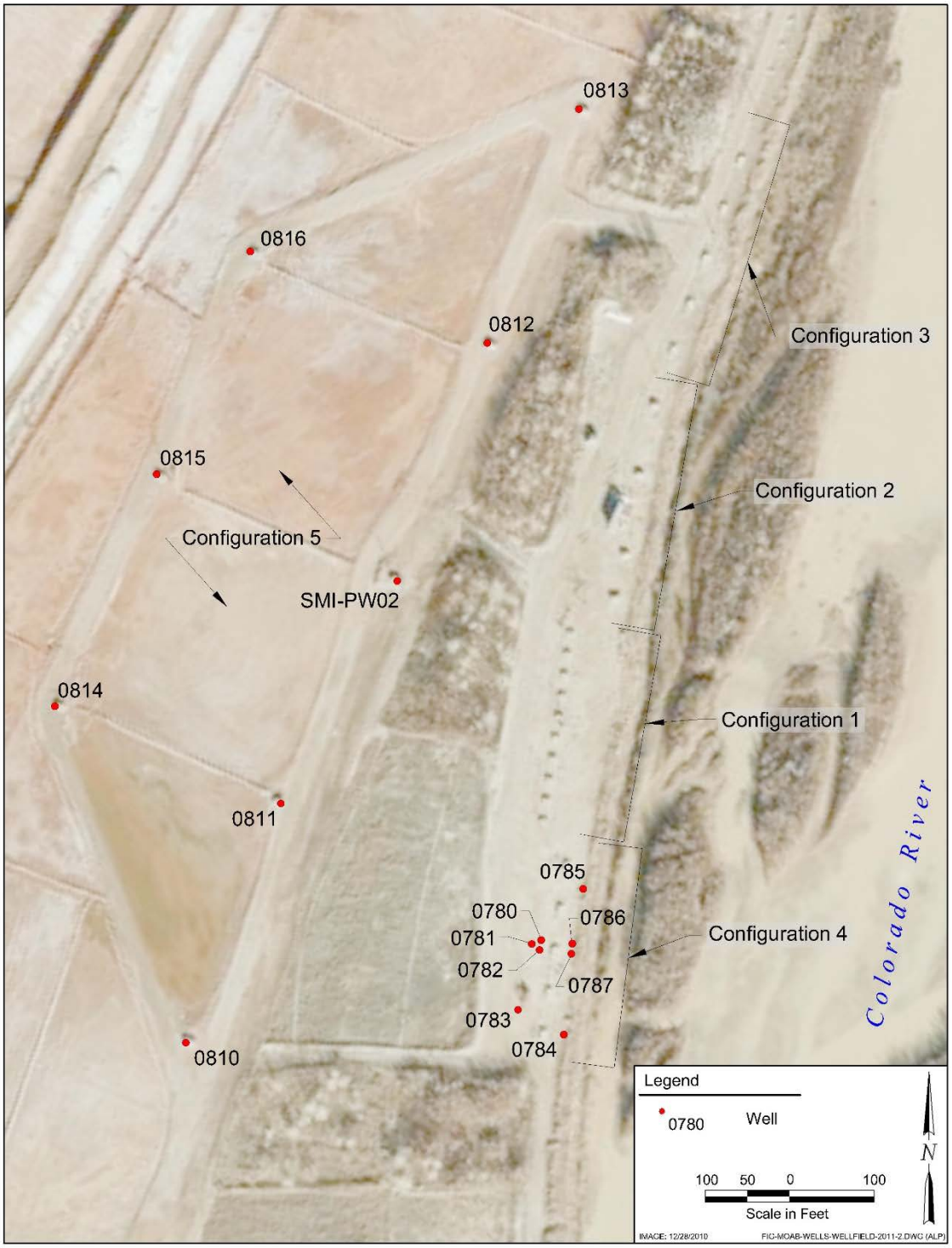

Figure 1. First Half 2019 CF4 and CF5 Groundwater Sampling Locations

Figure 2. Crescent Junction Well 0205 Sampling Location

2.0 Summary of Sampling Events

2.1 January 2019 CF4 Sampling Event

Groundwater samples were collected from the eight CF4 monitoring wells to measure the baseline groundwater contaminant concentrations. The freshwater injection system was shut down at the end of November 2018. Except the approximately 550,000 gallons (gal) of fresh water that were injected into the groundwater system the last two weeks of November 2018, the freshwater injection system had not been consistently operational since July 2018 (due to power issues in CF4).

These results potentially represent background ammonia concentrations and will be compared to the results of samples collected after the system has been consistently running for an extended period of time to determine how effective the freshwater injection system is in diluting the ammonia concentrations.

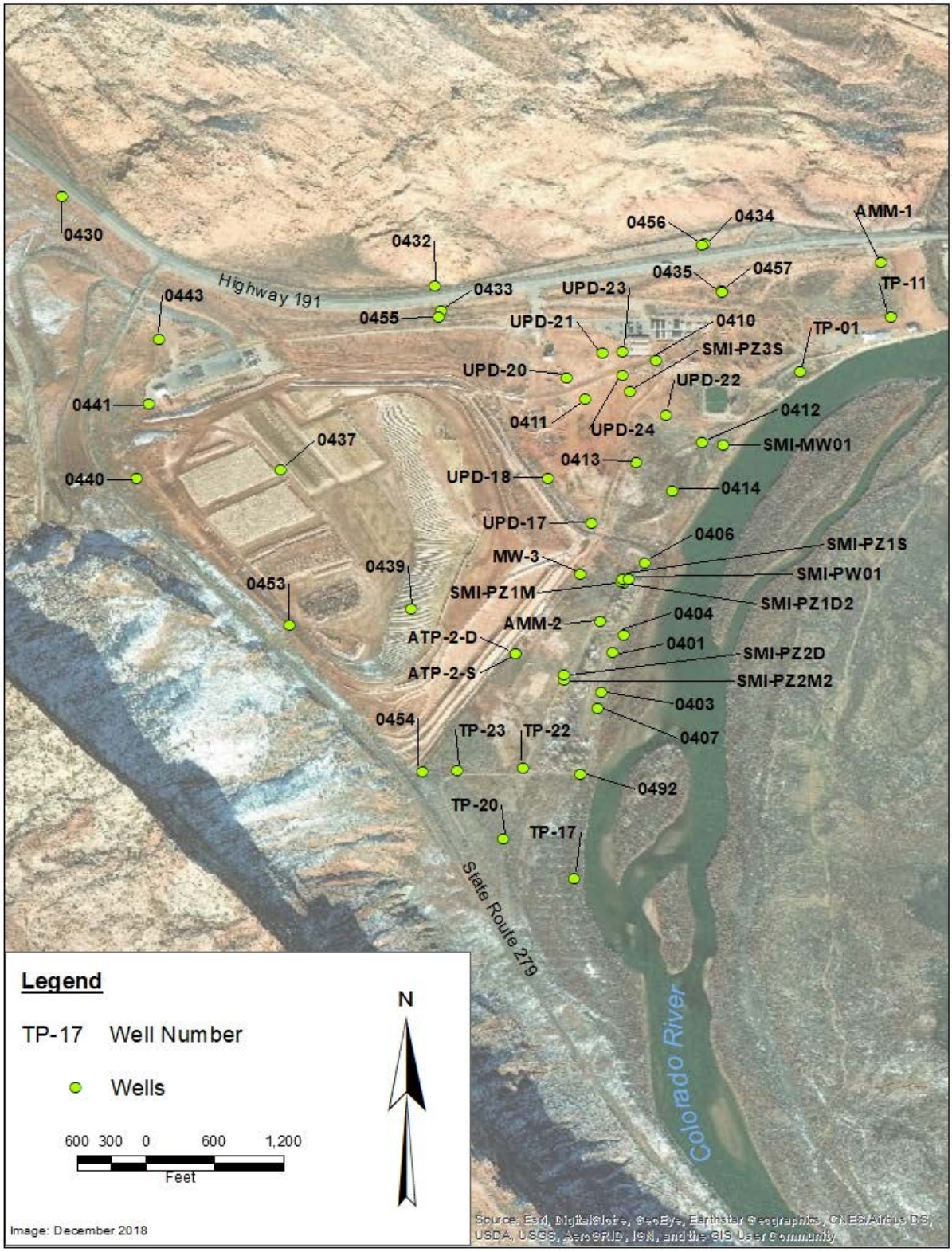

Figure 3. May/June 2019 Site-wide Groundwater Sampling Locations

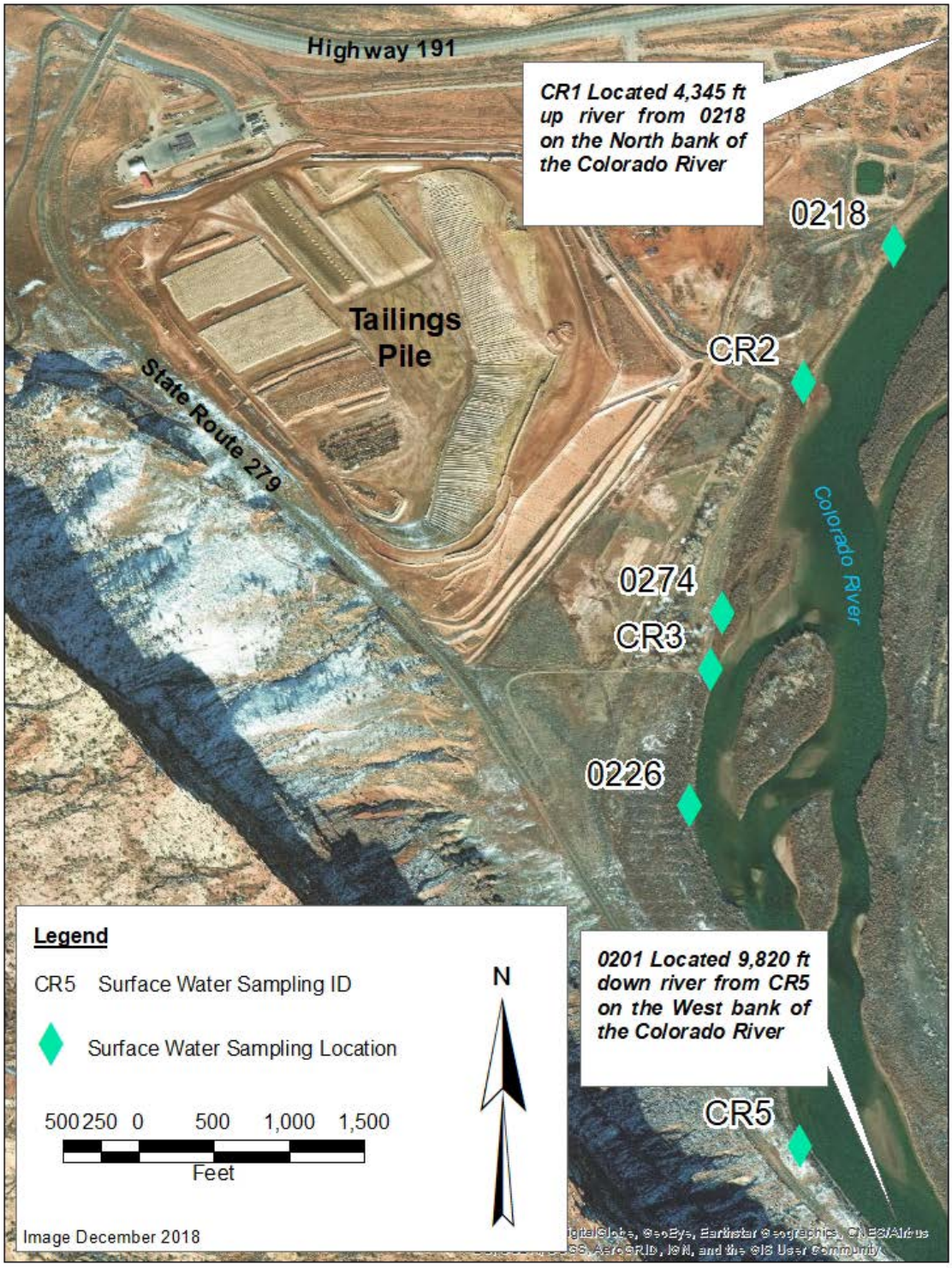

Figure 4. May/June 2019 Surface Water Sampling Locations

2.2 March 2019 Crescent Junction Sampling Event

A groundwater sample was collected from well 0205 as part of the quarterly monitoring at the Crescent Junction site. If water is present in any of the four monitoring wells during a quarterly monitoring event, a sample is typically collected.

2.3 April 2019 CF4 and CF5 Sampling Event

By late April 2019, the freshwater injection system had been consistently injecting water for four weeks, with a total of more than 1.1 million gal injected into the subsurface. These groundwater samples were collected from the eight CF4 monitoring wells to determine how effectively the freshwater injection system was diluting the ammonia concentrations, particularly downgradient of the CF4 injection wells. Groundwater samples were also collected from seven of the eight CF5 groundwater extraction wells during this event to update the mass removal calculations.

2.4 May/June 2019 Site-wide Sampling Event

Sixty groundwater and surface water samples were collected as part of the site-wide event. This event corresponds to the time the Colorado River is generally experiencing peak spring runoff flow conditions. The 52 groundwater samples were collected from a variety of downgradient and cross-gradient locations at various depths. The locations in the vicinity of the northeastern uranium (U) plume were also included. The eight surface water samples were collected upstream, downstream, and adjacent to the site during this event. All samples were submitted to the ALS Global laboratories for ammonia and uranium analysis.

3.0 Data Assessment

The following definitions are associated with the data validation process and apply to Section 3.0. Data validation details are provided in the following sections of this report for the individual sampling events.

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 continuing calibration checks are established to ensure the instrument continues to produce acceptable qualitative and quantitative data.

In addition, for inductively coupled plasma (ICP) analytes (uranium), reporting limit verifications (CRIs) verify the linearity of the calibration curve near the reporting limit (RL). For ICP-mass spectrometry analytes (uranium), instrument tuning and performance criteria are checked for mass calibration and resolution verifications. For ICP-mass spectrometry analyte uranium, internal standards are also analyzed to indicate stability of the instruments.

Method and Calibration Blanks
Method blanks (MBs) are analyzed to assess any contamination that may have occurred during sample preparation. Both initial calibration blanks and continuing calibration blanks (CCBs) are analyzed to assess instrument contamination before and during sample analysis. Depending on method requirements, detected sample results greater than the method detection limit (MDL) or instrument detection limit (IDL) were qualified "J" 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.

Laboratory Control Sample Duplicates
Matrix spike (MS) samples may not be generated due to a limited sample volume. Instead, laboratory control sample (LCS) duplicates **(**LCSDs) are performed. LCSDs that contain known concentrations of the analyte of interest are prepared in the laboratory. The results are used to demonstrate the laboratory is in control of the preparation and analysis of samples.

Matrix Spike and Replicate Analysis
MS sample analysis, performed at a frequency of one per 20 samples unless otherwise noted, is a measure of the ability to recover analytes in a particular matrix. The MS sample results are required to be within the recovery limits.

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

Field Duplicate Analysis
Field duplicate samples are collected and analyzed as an indication of the 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. The duplicate results must meet the U.S. Environmental Protection Agency (EPA)-recommended laboratory duplicate criteria of less than 20 RPD for results that are greater than five times the RL.

Laboratory Control Samples
LCSs provide information on the accuracy of the analytical method and the overall laboratory performance, including sample preparation. Per national environmental laboratory accreditation requirements provided by the NELAC Institute, an MS may be used in place of an LCS provided the acceptance criteria are as stringent.

Metals Serial Dilution
Serial dilution (SD) samples are prepared and analyzed for the metals analyses to monitor chemical or physical interferences in the sample matrix.

Detection Limits/Dilutions
Dilutions are prepared in a consistent and acceptable manner when they are required. CRIs are rerun at the beginning of each analytical run as a measure of accuracy near the RL. CRIs were made at the required frequency to verify the linearity of the calibration curve near the RL.

3.1 January 2019 CF4 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)	1901108
Laboratory:	ALS Global, Fort Collins, Colorado
Sample Data Group (SDG) Numbers:	19011363
Analysis:	Metals and Inorganics
Validator:	Elizabeth Moran
Review Date:	28 March 2019

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

Table 1. January 2019 CF4 Sampling Event, Analytes and Methods

Analyte	Preparation Method	Analytical Method
Ammonia as N, NH_3-N	EPA 350.1	EPA 350.1
Uranium	SW-846- 3005A	SW-846 6020A

Data Qualifier Summary
Analytical results were qualified as listed in Table 2. Refer to Table 3 for an explanation of the data qualifiers applied.

Table 2. January 2019 CF4 Sampling Event, Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
1901363-1 1901363-3	0437, 0440	Ammonia	J	CB-1
All	All in SDG 1901363	Ammonia	J	MS-1, MSD-1
All	All in SDG 1901363	Uranium	J	MS-2 MSD-2
All	All in SDG 1901363	Uranium	J	SD-1

"J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit.

Sample Shipping/Receiving
ALS Global received a total of 13 samples for RIN 1901108 in one shipment, which arrived on January 28, 2019 (UPS tracking number 1Z5W1Y510195205009). The SDG was accompanied by a chain-of-custody (COC) form.

Table 3. January 2019 CF4 Sampling Event, Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-detects)	Explanation
CB-1	J	N/A	The slope intercept was an absolute value that is >3x the MDL, so all results that are <3x MDL are flagged.
MS-1	J	UJ	The MS sample for the sample group had a recovery less than 80%.
MSD-1	J	UJ	No MSD data was included in the narrative.
MS-2	J	UJ	The MS sample chosen was from another client.
MSD-2	J	UJ	The MSD sample chosen from another client.
SD-1	J	N/A	No SD was run with the sample group.

MDL = method detection limit; mg/L = milligrams per liter.
"J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit.

The COC form was checked to confirm all samples were listed on the form with sample collection dates and times, and that signatures and dates were present, indicating sample relinquishment and receipt.

Preservation and Holding Times
SDG 1901363 was received with a temperature of 0.3°C. All samples were received in the correct container types, and all samples were analyzed within the applicable holding times.

Laboratory Instrument Calibration

Method SW-846 6020A, Uranium
The initial calibrations were performed using five calibration standards and one blank, resulting in calibration curves with correlation coefficient (r^2) values greater than 0.995. The values of the calibration curve intercepts for uranium were positive and less than three times the IDL.

Initial calibration verification (ICV) and continuing calibration verification (CCV) checks were made at the required frequency. All calibration checks met the acceptance criteria. CRIs were made at the required frequency to verify the linearity of the calibration curve near the RL. The CRI verifications were within the acceptance criteria range. Mass calibration and resolution verifications were performed at the beginning of each analytical run in accordance with the analytical procedure.

Method EPA 350.1, Ammonia as N
Initial calibrations for ammonia as N was performed using five calibration standards and one blank. The calibration curve had an r^2 value greater than 0.995; however, the slope intercept was more than three times the MDL. The samples that have a concentration less than three times the y-intercept are flagged "J." This applies to samples 1901363-1 (0437) and 1901363-3 (0440). Nondetects are not qualified. ICV and CCV checks were made at the required frequency.

Method and Calibration Blanks
Two of the CCBs for the ammonia analysis were slightly above the MDL, and eight of the sample results were less than five times the highest continuing calibration verification (CCB); therefore locations 1810184-10 through -17 were flagged "J" for reason CCB-1.

One of the CCBs on uranium SDG 19011363 was slightly above the MDL; however, no sample concentrations were less than five times the highest CCB and no locations had to be flagged.

Matrix Spike Analysis
Sample location 1901363-1 (0437) was chosen for the ammonia MS analysis. The RPD between the sample and the spike was 66 percent, which is below the 75 to 125 percent threshold. In addition, a MSD sample was not analyzed. All ammonia data had to be flagged "J" for reasons MS-1 and MSD-1.

For the uranium SDG, the MS sample that was selected for quality control (QC) analysis was from another client, and the information was not included in the analysis. Therefore, all of the uranium data on were flagged "J" for reasons MS-2 and MSD-2.

Laboratory Replicate Analysis
The uranium SDGs did not contain an MS or MSD sample. Therefore, all of the uranium data were flagged "J" for reason MSD-1.

Field Duplicate Analysis
A duplicate sample was collected from location 1901363-11 (0786). 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 Samples
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
Since no SD samples were run on the uranium samples in any of the SDGs, the uranium samples were flagged "J" for reason SD-1.

Detection Limits/Dilutions
Dilutions were prepared in a consistent and acceptable manner when they 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 (EDD) files arrived February 21, 2019. The contents of the EDD 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 results were within the historical ranges, and there were no anomalous data values associated with this sampling event.

3.2 March 2019 Crescent Junction 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 2, Data Deliverables Examination. All analyses were successfully completed.

General Information and Validation Results

RIN 1903110
Laboratory: ALS Global, Fort Collins, Colorado
SDG Numbers: 1903110
Analysis: Metals, Inorganics, Isotopic Uranium
Validator: James Ritchey
Review Date: 29 October 2019

The samples were prepared and analyzed using accepted procedures as shown in Table 4.

Table 4. March 2019 Crescent Junction Sampling Event, Analytes and Methods

Analyte	Preparation Method	Analytical Method
Ammonia as N, NH_3-N	EPA 350.1	EPA 350.1
Alkalinity	EPA 310.1	EPA 310.1
Bicarbonate	EPA 310.1	EPA 310.1
Carbonate	EPA 310.1	EPA 310.1
Nitrate/Nitrite as N	EPA 353.2	EPA 353.2
Bromide	EPA 300.0 Rev 2.1	300.0 Rev 2.1
Chloride	EPA 300.0 Rev 2.1	300.0 Rev 2.1
Fluoride	EPA 300.0 Rev 2.1	300.0 Rev 2.1
Sulfate	EPA 300.0 Rev 2.1	300.0 Rev 2.1
Arsenic, Barium, Boron, Cadmium, Calcium, Chromium, Copper, Iron, Lead, Magnesium, Manganese, Molybdenum, Potassium, Selenium, Silver, Sodium	SW-6010B	EPA 6010B
Uranium	SW-846- 3005A	SW-846 6020A
Total Dissolved Solids	EPA 160.1	540 C
Isotopic Uranium	SOP 776/778	SOP 714

Data Qualifier Summary

Analytical results were qualified as listed in Table 5. Refer to Table 6 for an explanation of the data qualifiers applied.

Table 5. March 2019 Crescent Junction Sampling Event, Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
1903462-1	0205	All Metals	J	MS-1, MSD-1
1903462-1	0205	All Metals	J	SD-1
1903462-1	0205	Chloride, Sulfate	J	MS-2, MSD-2

"J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit.

Table 6. March 2019 Crescent Junction Sampling Event, Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-detects)	Explanation
MS-1, MSD-1, SD-1	J	UJ	Per method requirements, matrix QC was performed for this analysis, however, a sample from this order number was not the selected QC sample. Therefore, the data were not included in the narrative.
SD-1	J	N/A	SD analysis was not conducted on the metals.
MS-2, MSD-2	J	UJ	The chloride and sulfate concentrations in the native sample were above the analytical range; therefore, accurate quantitation of MS/MSD recoveries were not possible.

"J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit.

Sample Shipping/Receiving

ALS Global in Fort Collins, Colorado, received one sample for RIN 1903110 in a shipment of one cooler. The shipment (SDG 1903462) contained one groundwater sample from Crescent Junction well 0205. The temperature of the cooler was 5.8°C, and it arrived on March 19, 2019 (Tracking number 1Z5W1Y510195349088).

The COC forms were 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

The samples were received in the correct container types and had been correctly preserved for the requested analyses. When received, the temperatures of the samples were slightly above the appropriate level; however, the difference in temperature was unlikely to have had a significant impact on the analyses. The samples were analyzed within the applicable holding time.

Case Narratives

The case narratives were reviewed, and all detects where found to be within QC procedures except the following.

Matrix Spike and Replicate Analysis

For the metals analysis, the selected QC sample was from another client and not included in the narrative. As a result, there was not a MSD or a SD sample analysis. Therefore, all of the metal data are flagged "J" for reasons MS-1, MSD-1, and SD-1.

For SDG 1903462, an MS was performed for the anion analyses. The chloride and sulfate MS samples failed because the native concentration was too high. Therefore, these samples were flagged "J" for reasons MS-2 and MSD-2.

Completeness

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

Electronic Data Deliverable Files
The EDD files arrived on April 23, 2018. The contents of the EDD 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
Appendix B contains the Minimums and Maximums Report for this sampling event. Based on the results, there was one anomalous data point associated with this sampling event. The U-235 concentration measured in March 2019 was above the historical maximum, as shown in Table 7.

Table 7. Anomalous Data Associated with the March 2019 Crescent Junction Site-wide Sampling Event

Location	Sample Date	Analyte	Concentration (pCi/L)	Historical Minimum (pCi/L)	Historical Maximum (pCi/L)	Disposition
0205	03/19/2019	U-235	1.45	0.32	0.81	The uncertainty associated with this result is 0.75 pCi/L.

pCi/L = picocuries per liter

3.3 April 2019 CF4 and CF5 Sampling Event

3.3.1 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 1904113
Laboratory: ALS Global, Fort Collins, Colorado
SDG Numbers: 1905052
Analysis: Metals, Inorganics, Isotopic Uranium
Validator: James Ritchey
Review Date: 28 October 2019
The samples were prepared and analyzed using accepted procedures as shown in Table 8.

Table 8. April 2019 CF4/CF5 Sampling Event, Analytes and Methods

Analyte	Preparation Method	Analytical Method
Ammonia as N, NH_3-N	EPA 350.1	EPA 350.1
Uranium	SW-846- 3005A	SW-846 6020A

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

Table 9. April 2019 CF4/CF5 Sampling Event, Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
1905052-1 through -16	All in SDG 195052	Uranium	J	MS-1, MSD-1, SD-1
1905052-1 through -16	All in SDG 195052	Ammonia	J	MSD-1

"J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit.

Table 10. April 2019 CF4/CF5 Sampling Event, Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-detects)	Explanation
SD-1	J	U	No SDs were run during the uranium analysis.
MS-1	J	U	The MS sample for the sample group was from another client.
MSD-1	J	U	No MSD data was included in the narrative.

"J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit.

Sample Shipping/Receiving

ALS Global received a total of 16 samples for RIN 1904113 in one shipment, which arrived on May 3, 2019 (UPS tracking number 1Z5W1Y510191470819). The SDG was accompanied by a COC form.

The COC forms were 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

All of the SDGs were received intact. SDG 1905052 was received with a temperature of 4.3°C, which complies with requirements. All samples were received in the correct container types. All samples were analyzed within the applicable holding times. Three samples (1905052-8, 1905052-9, and 1905052-10) were reported with uncharacteristically high ammonia results when compared with past results.

These samples were rerun on July 25, 2019, after the hold time had expired, and revised results were received on August 10, 2019. The new results were characteristic of past results and no additional flagging was attributed for the expired hold time.

Case Narratives

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

Laboratory Instrument Calibration

Method SW-846 6020A, Uranium

The initial calibrations were all performed using four calibration standards and one blank, resulting in calibration curves with r^2 values greater than 0.995. The values of 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 met the acceptance criteria. CRIs were made at the required frequency to verify the linearity of the calibration curve near the RL. The CRI verifications 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 on all SDGs were performed using five calibration standards and one blank. The calibration curve had an r^2 value greater than 0.995.

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

None of the CCBs on the ammonia SDG 1905052 were above the MDL, and none of the sample results were less than five times the highest CCB; therefore, no locations were flagged.

None of the CCBs on uranium SDG 1905052 were above the MDL, and no sample results were less than five times the highest CCB the highest CCB; therefore, no locations had to be flagged.

Matrix Spike Analysis

All of the ammonia MSs met the requirements for frequency and percent recovery, so no data had to be qualified. For the uranium SDG, the MS sample that was selected for QC analysis was from another client, and the information was not included in the analysis. Therefore, all of the uranium data was flagged "J" for reason MS-1.

Laboratory Replicate Analysis

The uranium SDGs did not contain an MS or MSD sample. Therefore, all of the uranium data is flagged "J" for reason MSD-1.

An MS was performed for the ammonia SDG and was within the recovery range; however, an MSD was not performed, so the data were flagged "J" for reason MSD-1.

Field Duplicate Analysis

A duplicate sample was collected from location 0785 (1905052-6). 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 Samples

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

Since no SD samples were run on the uranium samples in any of the SDGs, the uranium samples were flagged "J" for reason SD-1.

Detection Limits/Dilutions
Dilutions were prepared in a consistent and acceptable manner when they 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
EDD files arrived June 6, 2019. The contents of the EDD 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.

Upon review, three samples (1905052-8, 1905052-9, and 1905052-10) were reported with uncharacteristically high ammonia results when compared with past results. As mentioned earlier under Preservation and Holding times, these three samples were rerun after the hold time had expired. The rerun results were received on August 10, 2019, and were then more characteristic of past results.

3.3.2 Minimums and Maximums Report and Anomalous Data Review
Appendix C contains the Minimums and Maximums Report for this sampling event. Based on the results, all concentrations were within the acceptable ranges, and there were no anomalous data values associated with this sampling event.

3.4 May/June 2019 Site-wide Sampling Event

3.4.1 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	1905114
Laboratory:	ALS Global, Fort Collins, Colorado
SDG Numbers:	1905336, 1906013, 1906360
Analysis:	Metals and Inorganics
Validator:	Nina Andrews
Review Date:	28 October 2019

The samples were prepared and analyzed using accepted procedures as shown in Table 11. Analytical results were qualified as listed in Table 12. Refer to Table 13 for an explanation of the data qualifiers applied.

Table 11. May/June 2019 Site-wide Sampling Event, Analytes and Methods

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

Table 12. May/June 2019 Site-wide Sampling Event, Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
1906013- 1 through 5, 7, 11 through 15	0201, 0218, 0226, 0274, 0437, 0440, 2002, CR1, CR2, CR3, CR5	Ammonia	J	MB-1
1906013- 1 through 5, 7, 11 through 15	0201, 0218, 0226, 0274, 0437, 0440, 2002, CR1, CR2, CR3, CR5	Ammonia	J	CCB-1
1906360- 5, 7 through 10, 12 through 16, 18 and 21	0410, 0430, 0432, 0433, 0434, 0441, 0443, 0455, 0456, 0457, SMI-PZ3S, UPD-20	Ammonia	J	CCB-1
1905336-1 through 25 1906013-1 through 16 1906360-1 through 23	All in each uranium SDG	Uranium	J	MS-1, MSD-1, SD-1
1906336-1 through 25	All in SDG 1906336	Ammonia	J	MSD-2
1906013-1 through 16	All in SDG 1906013	Ammonia	J	MS-1, MSD-2
1906360-1 through 23	All in SDG 1906360	Ammonia	J	MSD-2
1906360-1 through 23	All in SDG 19006360	Ammonia	J	MS-2

"J" indicates results are estimated and becomes "UJ" for analytical results lower than the detection limit.

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

Preservation and Holding Times

All of the SDGs were received intact. SDG 1905336 was received with a temperature of 3.8°C, SDG 1906013 was received with a temperature of 19.7°C, and SDG 1906360 was received with a temperature of 1.3°C. SDGs 1905336 and 1906360 arrived with compliant temperatures, and the SDG 1906013 temperature was too high due to shipping issues; UPS misplaced cooler for approximately one day. Samples were run regardless, and, since the results came back in similar range to historic data, locations were not resampled. All samples were received in the correct container types. All samples were analyzed within the applicable holding times.

Table 13. May/June 2019 Site-wide Sampling Event, Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-detects)	Explanation
MB-1	J	U	At least on MB was higher than the MDL; therefore, all detects <5x the highest blank should be flagged.
CCB-1	J	U	At least one CCB was higher than the MDL; therefore, all detects <5x the highest blank should be flagged.
SD-1	J	U	No SDs were run during the uranium analysis.
MS-1	J	U	No MS data was included in narrative.
MSD-1	J	U	No MSD data was included in the narrative.
MS-2	J	U	The MS failed due to a low percent recovery.
MSD-2	J	U	No MSD data was included in the narrative.

"J" indicates results are estimated and becomes "UJ" for analytical results lower than the detection limit.

Sample Shipping/Receiving

ALS Global in Fort Collins, Colorado, received a total of 54 samples for RIN 1905114 in three shipments (Table 14).

Table 14. May/June 2019 Site-wide Sampling Event, Sample Shipping/Receiving

SDG	Number of Samples	Arrival Date	UPS Tracking Number
1905336	25	6/06/18	1Z5W1Y510193130049
1906013	16	6/19/18	1Z5W1Y510130134863
1906360	23	6/29/18	1Z5W1Y51095531157

Laboratory Instrument Calibration

Method SW-846 6020A, Uranium

The initial calibrations were all performed using four calibration standards and one blank, resulting in calibration curves with r^2 values greater than 0.995. The values of 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 met the acceptance criteria. CRIs were made at the required frequency to verify the linearity of the calibration curve near the RL. The CRI verifications 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.

EPA 350.1, Ammonia as N

Initial calibrations for ammonia as N on all SDGs were performed using five calibration standards and one blank. The calibration curve had an r^2 value greater than 0.995. 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

Two of the MBs on the ammonia SDG 1906013 were slightly above the MDL, and eleven of the sample results in that SDG were less than five times the highest MB; therefore, locations 1906013-1, 1906013-2, 1906013-3, 1906013-4, 1906013-5, 1906013-7, 1906013-11, 1906013-12, 1906013-13, 1906013-14, and 1906013-15 were flagged ‘J “for reason MB-1. All of those same sample locations were also flagged for CCB-1, because they were less than five times the highest of four CCBs that failed in that SDG.

Thirteen calibration blanks in SDG 1906360 were slightly above the MDL, and 12 of the sample results in that SDG were less than five times the highest CCB; therefore, locations 1906360-5, 1906360-7, 1906360-8, 1906360-9, 1906360-10, 1906360-12, 1906360-13, 1906360-14, 1906360-15, 1906360-16, 1906360-18, and 1906360-21 were flagged “J” for reason CCB-1.

All CCBs for uranium on all three SDGs reported lower than the IDL, so no samples had to be flagged for uranium.

Equipment Blanks
One EB (location 2001, 1906013-10) was collected after the surface water tubing was decontaminated. The result had 0.02 milligrams per liter (mg/L); therefore, some of the surface water samples collected with that non dedicated equipment had results higher than 0.02 mg/L. The results from those samples were all below the reporting limit of 0.1 mg/L therefore the data is no flagged. This occurred at surface water sites 0226, 0274, CR1 and CR3.

Matrix Spike Analysis
For all of the uranium SDGs, the MS sample that was selected for QC analysis was from another client and the information was not included in the analysis. Therefore, all of the uranium data on was flagged "J" for reason MS-1.

One ammonia SDG (1906360) had a low recovery on the MS analysis; therefore, all of the ammonia data in SDG 1906360 has been flagged "J" for reason MS-2. SDG 1906013 had no MS run at all, so all samples in the SDG were flagged "J" for reason MS-1.

Laboratory Replicate Analysis
The uranium SDGs did not contain an MS or MSD sample. Therefore all of the uranium data were flagged "J" for reason MSD-1.

Field Duplicate Analysis
Duplicate samples were collected from locations AMM-2 (1905336-8), 0492 (1906013-9), and 0435 (1906360-11), 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 Samples
LCS results were acceptable for ammonia analyses. 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. LCSs were run with the Uranium analysis however none were from the Project's samples.

Metals Serial Dilution
SD samples were not run on the uranium samples in any of the SDGs, so the uranium samples were flagged "J" for reason SD-1.

Detection Limits/Dilutions
Dilutions were prepared in a consistent and acceptable manner when they 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
EDD files arrived June 14, July 2, and July 20, 2019. The contents of the EDD 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.

3.4.2 Minimums and Maximums Report and Anomalous Data Review

The Minimums and Maximums Report for this sampling event is located in Appendix C. There were two anomalous data points, both based on the ammonia results. One of the data points (location 0434) was above the above the historical maximum, and the other (from location UPD-23) was below the historical minimum, as shown in Table 15.

Table 15. Anomalous Data Associated with the May/June 2019 Site-wide Sampling Event

Location	Sample Date	Analyte	Concentration (mg/L)	Historical Minimum (mg/L)	Historical Maximum (mg/L)	Disposition
0434	06/11/2019	Ammonia Total as N	1.1	0.0854	0.3	Concentration still considered very low.
UPD-23	05/16/2019	Ammonia Total as N	0.69	7.3	1.4	Sample collected from location outside main ammonia plume; concentration not a concern.

4.0 Results

4.1 January 2019 CF4 Sampling Event Results

The eight monitoring wells surrounding the CF4 wells that inject fresh water into the subsurface are sampled to determine the effectiveness of the injection system. This system was shut down in early July 2018 due to an electrical system issue, and was not re-started until mid-November 2018.

The system then was operational only two weeks, and was then shut down again. As a result, only approximately 720,000 gal were injected over the previous six months, and no injection occurred in the six weeks prior to this sampling event. These CF4 locations were sampled before restarting the system to determine if the impacts of injection can be detected after the system had been shut off for six weeks. All locations are provided in Figure 1, and the ammonia concentrations are displayed on Figure 5.

The CF4 wells are screened and deliver fresh water into the subsurface from 15 to 35 feet below ground surface (ft bgs). Even after six weeks of no active injection, the ammonia concentrations associated with the downgradient samples collected from a depth less than 20 ft bgs (wells 0784 and 0785) were less than 20 mg/L, clearly indicating the injection system activity impacted this subsurface zone. The sample from the upgradient shallow zone (from well 0783) had an ammonia concentration of 20 mg/L, providing further evidence of the effectiveness of the system in decreasing contaminant concentrations.

Samples collected from wells 0780 and 0786 (28 ft bgs) and well 0782 (collected from 33 ft bgs) had ammonia concentrations ranging from 330 to 1,100 mg/L. These samples represent the conditions near the bottom of the zone where the CF4 injection wells deliver fresh water into the subsurface when the system is active. From a depth of 36 to 46 ft bgs, the ammonia concentrations ranged from 1,900 to 2,100 mg/L (wells 0781 and 0787).

While these concentrations are elevated, they are not considered true background. These results indicate that even after no active freshwater injection for six weeks with a minimal volume of freshwater injected just prior to that time, the groundwater system shows evidence of the injection system impacting the ammonia concentrations.

4.2 March 2019 Crescent Junction Sampling Event Results

Table 16 displays the analytical results of the March 2019 samples collected from well 0205, along with the results from the three previous sampling events in February, June, and October 2018. These results indicate the well 0205 analyte concentrations of the samples collected from well 0205 have generally not significantly changed. Of note, the nitrate concentration increased 12 percent (from 860 to 960 mg/L) during this time period, but the March 2019 concentration was still within the historical range.

The chloride, potassium, and sodium concentrations all decreased (10, 34, and 12 percent, respectively); however, only the potassium concentration (47 mg/L) established a historical minimum. The U-235 concentration increased from 0.56 to 1.45 pCi/L since the previous sample was collected. All remaining analytes were within the historical range. These results suggests the well continues to be recharged from the same water source.

4.3 April 2019 CF4 and CF5 Sampling Event Results

The eight CF4 monitoring wells were sampled again in April when the system was actively injecting fresh water, and after more than four weeks of consistently running the injection system to determine the effectiveness of the injection system. More than 1.1 million gal of fresh water were injected just prior to this sampling event. Table 17 presents the ammonia concentrations from the April event, and provides a comparison of the January and April 2019 sampling results. The April ammonia results are also are displayed on Figure 6.

The CF4 monitoring well sampling results indicate a significant reduction in ammonia concentrations in the downgradient direction (east), particularly in the zone above 28 ft bgs. In the upgradient direction, the groundwater system at this same depth is also impacted by freshwater injection.

Figure 7 presents the groundwater elevations generated as a result of the mounding developed during freshwater injection system operation in April 2019. Taking into account there was no injection into wells 0770 and 0771, the groundwater elevation data indicate there was groundwater mounding of more than 10 ft between the elevation inside the CF4 0772 through 0779 injection wells and the surrounding monitoring wells.

Groundwater samples were also collected from the CF5 extraction wells (locations shown on Figure 1) in April 2019, just prior to the well field being flooded due to the high river flows associated with the 2019 Colorado River spring runoff. It was not possible to collect a sample from well 0816, because the submersible pump was not operational (and eventually replaced).

The groundwater extraction system had operated on a regular basis since late-March 2019 (approximately six weeks) when the samples were collected. CF5 ammonia and uranium concentrations associated with this sampling event are displayed on Figure 8.

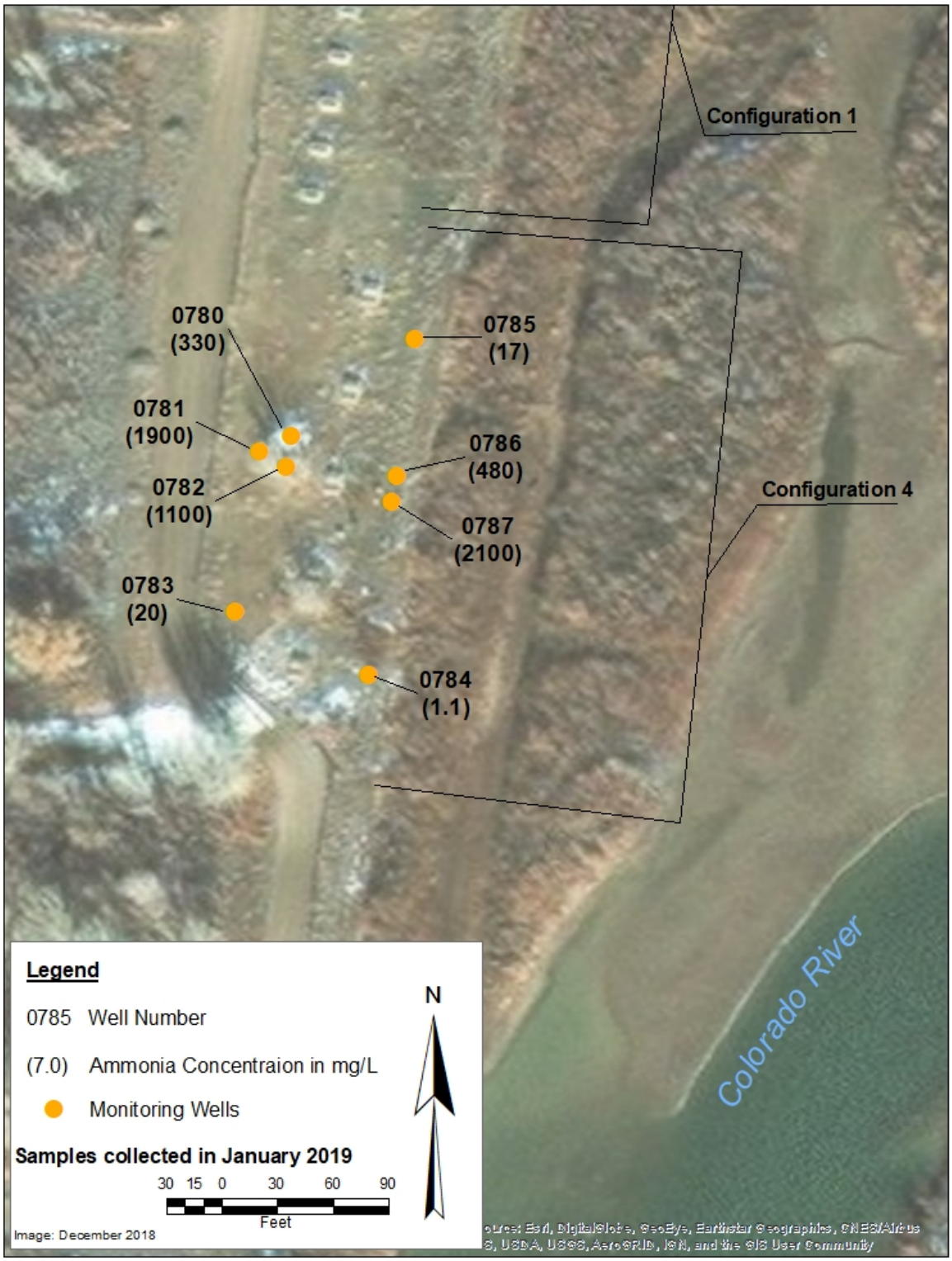

Figure 5. January 2019 CF4 Ammonia Groundwater Concentrations

Table 16. Crescent Junction Well 0205 Analyte Concentrations, February 2018 through March 2019

Analyte	Analyte Concentration on 2/6/18	Analyte Concentration on 6/27/18	Analyte Concentration on 10/03/18	Analyte Concentration on 03/19/19
Ammonia as N	14	13	22	13
Arsenic	0.039#	0.039#	0.0039#	0.039#
Bicarbonate as $CaCO_3$	1,000	1,100	1,100	1,100
Boron	1.3	1.4	1.1	1.4
Bromide	20#	40#	20#	20#
Cadmium	0.0033#	0.0033#	0.00033#	0.0033#
Calcium	330	370	300	330
Carbonate as $CaCO_3$	50#	20#	100#	20#
Chloride	3,500	3,400	3,900	3,500
Chromium	0.0051#	0.0051#	0.012	0.0051#
Copper	0.0097#	0.0097#	0.0047	0.0097#
Fluoride	10#	20#	10#	10#
Iron	0.049#	0.049#	0.026	0.049#
Lead	0.013#	0.013#	0.0013#	0.013#
Magnesium	850	1,000	1,000	820
Manganese	0.38	0.44	0.33	0.36
Molybdenum	0.011#	0.011#	0.013	0.011#
Nitrate/ Nitrite as N	600	940	860	960
Potassium	50	54	71	47
Selenium	4.1	4.4	4.1	3.1
Sodium	10,000	10,000	9,700	8,500
Sulfate	23,000	23,000	24,000	23,000
Total Alkalinity as $CaCO_3$	1,000	1,100	1,100	1,100
Total Dissolved Solids	35,000	46,000	41,000	39,000
Uranium $_{234}$	29.7 +/- 5.4 pCi/L	31.9 +/- 5.7 pCi/L	30.1 +/- 5 pCi/L	30.1 +/- 6 pCi/L
Uranium $_{235}$	0.32 +/- 0.27 pCi/L	0.64 +/- 0.37 pCi/L	0.56 +/- 0.19 pCi/L	1.45 +/- 0.75 pCi/L
Uranium $_{238}$	9.3 +/- 2 pCi/L	11.9 +/- 2.4 pCi/L	9.7 +/- 1.7 pCi/L	12.2 +/- 2.8 pCi/L
Uranium	0.028	0.037	0.029	0.025

= Concentration at or below the detection limit, NA = Sample not analyzed for this analyte
Note: All concentrations in mg/L, except where noted

Time versus concentration plots (Figures 9 through 12) were also generated to display trends of the CF5 extraction wells over a time period of more than eight years, which represents the approximate lifespan of the CF5 well field (extraction was started in April 2010).

Figure 9 is the time versus ammonia concentration plot for extraction wells 0810 through 0813 and SMI-PW02, all of which are located along the CF5 southeastern boundary. Figure 10 displays a time versus uranium concentration plot for the same set of wells. Figures 11 and 12 are the time versus ammonia and uranium concentration plots, respectively, for CF5 wells 0814 through 0816 (which are located closer to the base of the tailings pile). As previously mentioned, it was not possible to collect a sample from well 0816 during this event.

Table 17. CF4 Monitoring Well Ammonia Concentrations, January and April 2019

Location	Sample Depth (ft bgs)	Upgradient or Downgradient of Injection Wells	January 2019 Ammonia Concentration (mg/L)	April 2019 Ammonia Concentration (mg/L)
0780	28	Upgradient	330	1.4
0781	46	Upgradient	1,900	1,400
0782	33	Upgradient	1,100	180
0783	18	Upgradient	20	15
0784	18	Downgradient	1.1	1.7
0785	18	Downgradient	17	7.0
0786	28	Downgradient	480	11
0787	36	Downgradient	2,100	450

As the plots exhibit, the ammonia concentrations along the CF5 southeastern boundary ranged from 260 to 410 mg/L during the April sampling event (Figure 9). Well SMI-PW02, which is located at the center of this line of wells (and near the center of the groundwater contaminant plume), has historically had the highest concentration, and this was the case in this most recent event. Concentrations associated with samples collected from these wells have been fairly consistent since 2014.

Uranium concentrations (Figure 10) in samples from this same set of wells have, in general, been less consistent. Since October 2016, the concentrations have ranged from 1.5 to 3.6 mg/L, and the results from the April 2019 event have fallen within this range. Similar to the ammonia results, well SMI-PW02 continues to have the highest concentration.

As shown in Figure 11, ammonia concentrations in the wells located closer to the base of the tailings have been gradually declining since August 2014. The results from the most recent event continue that trend. Ammonia concentrations in the samples collected from locations 0814 and 0815 were similar (140 and 120 mg/L, respectively). The uranium concentrations (Figure 12) have been more consistent, with the results showing a gradual increase since 2017. During the April 2019 event, the concentrations of the samples collected from wells 0814 and 0815 were 3.0 and 3.3 mg/L, respectively.

Taking into account all eight extraction wells, the ammonia concentrations continue to be higher in the samples collected from wells located along the CF5 southeastern boundary compared to the wells located along the toe of the tailings pile. A similar trend is not apparent in the uranium concentrations, with both sets of wells having very similar results.

4.4 May/June 2019 Site-wide Sampling Event Results

All samples collected during this event were analyzed for both ammonia and uranium. There is no groundwater standard for ammonia; however, Table 18 presents all locations sampled that exceeded the 0.044 mg/L uranium groundwater standard.

This standard is based on Table 1 in Title 40 Code of Federal Regulations Part 192 (40 CFR 192), "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, Subpart A, Standards for the Control of Residual Radioactive Materials from Inactive Uranium Processing Sites," assuming U-234 and U-238 activities are in equilibrium.

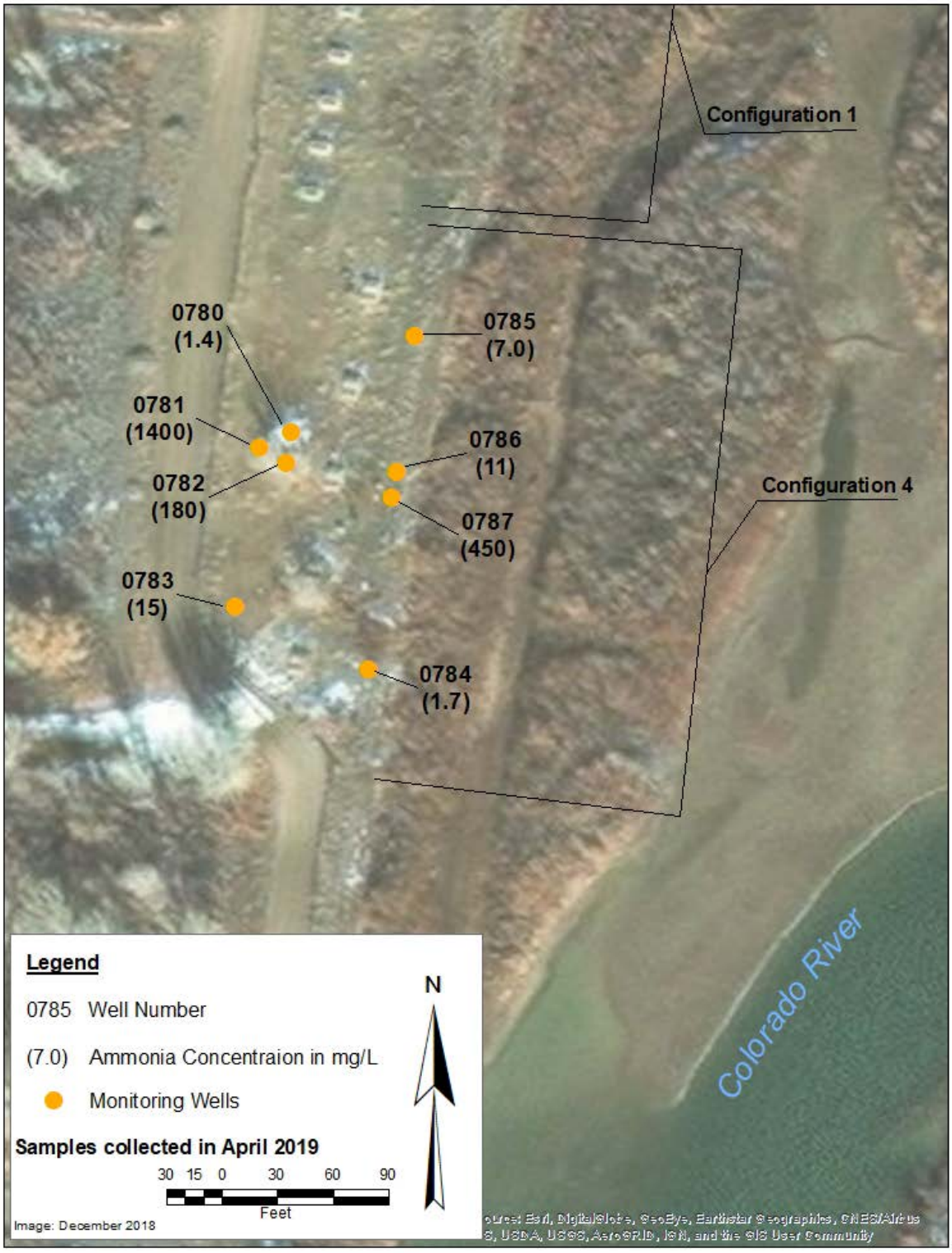

Figure 6. April 2019 CF4 Ammonia Groundwater Concentrations

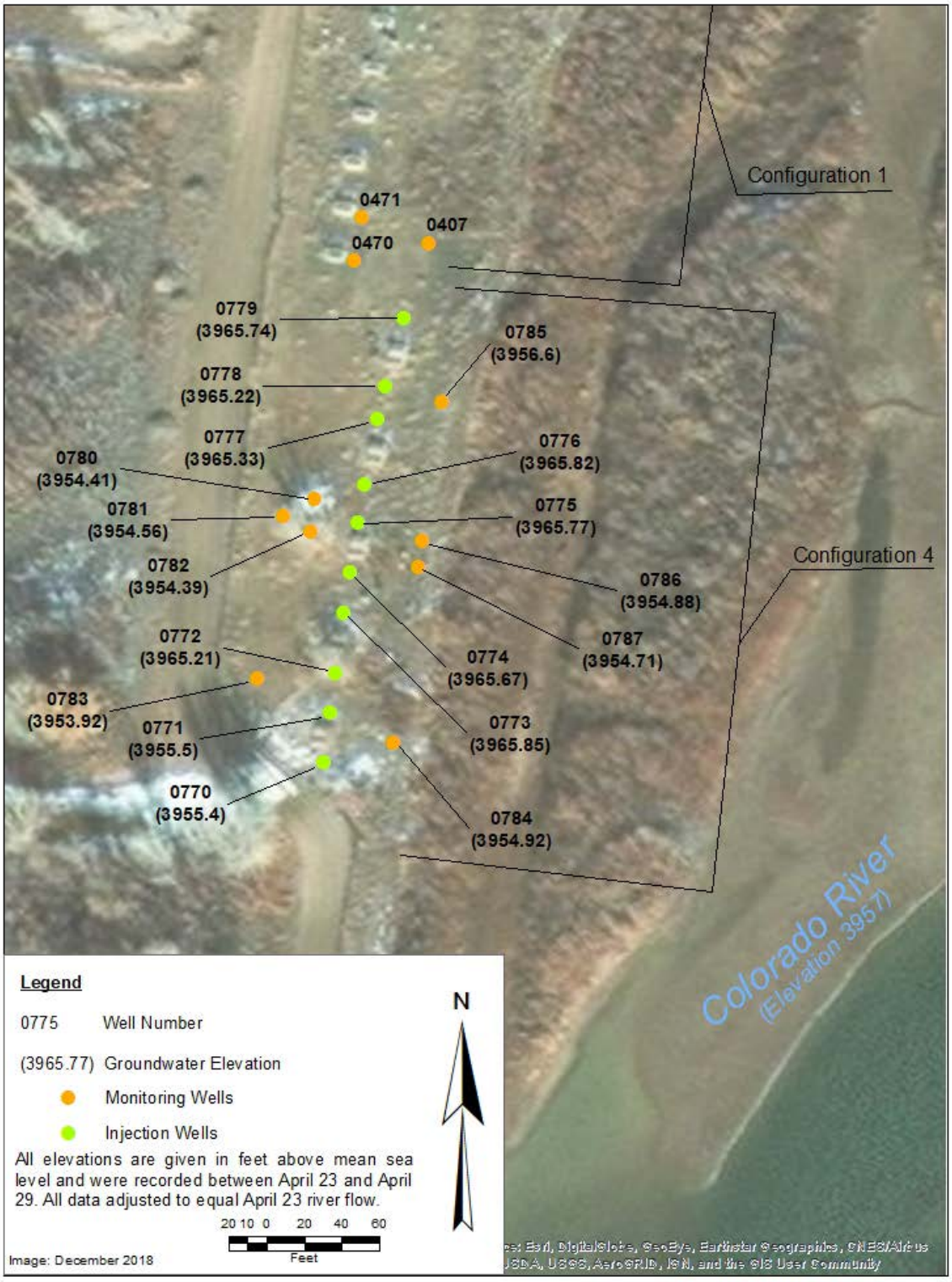

Figure 7. April 2019 CF4 Groundwater Elevations

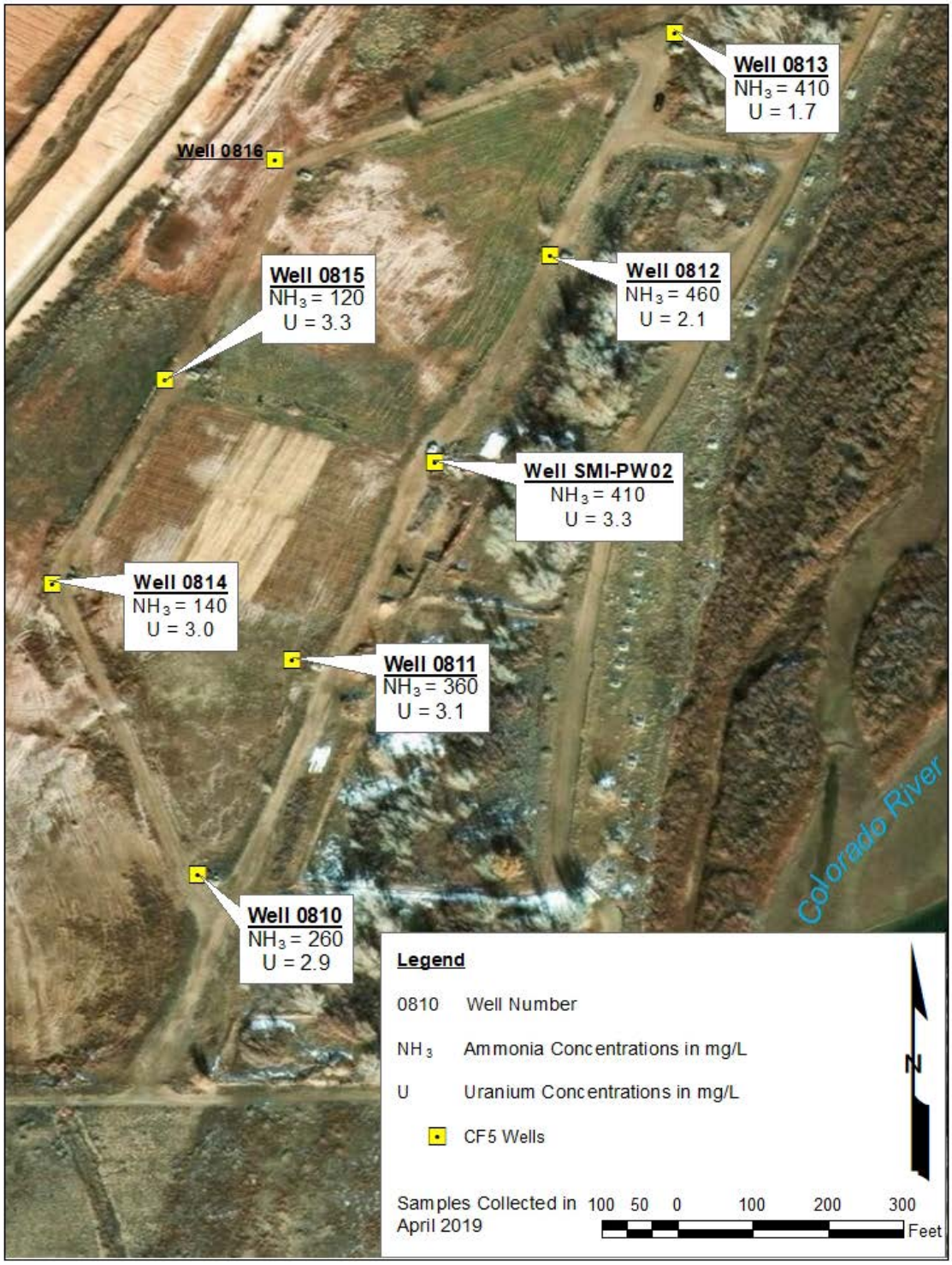

Figure 8. April 2019 CF5 Ammonia and Uranium Groundwater Concentrations

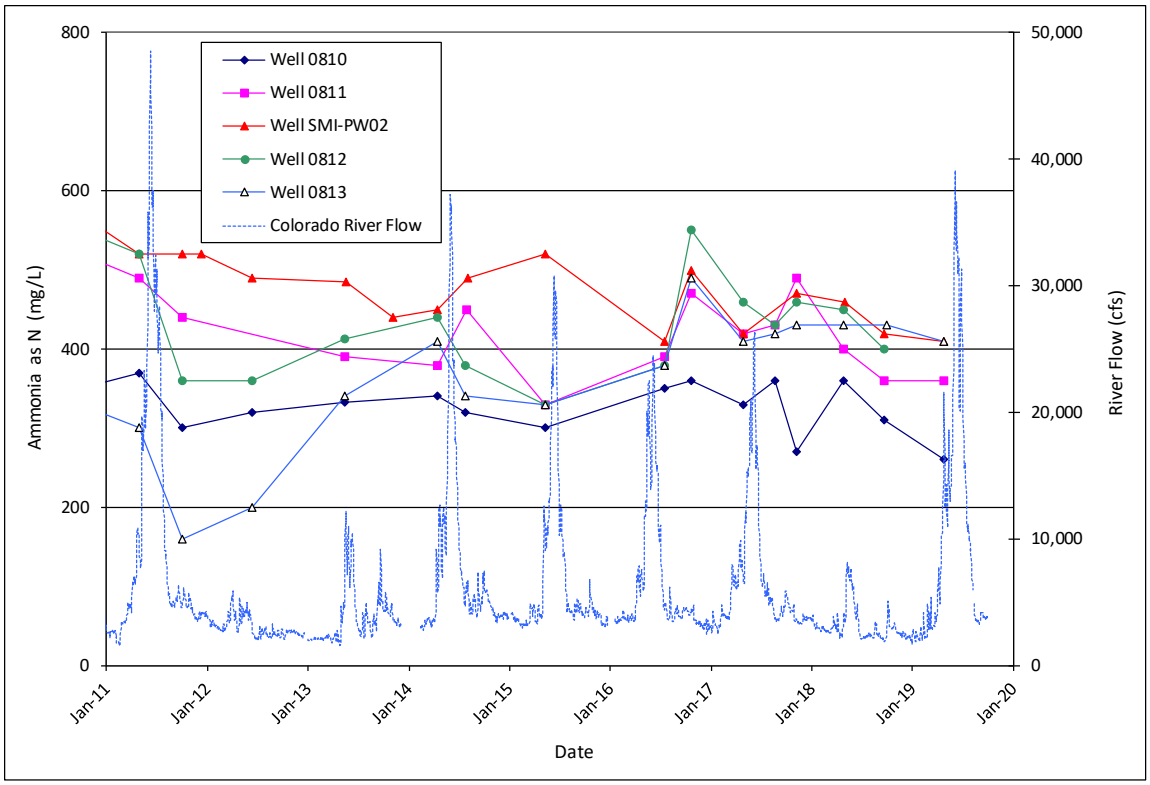

Figure 9. CF5 Extraction Wells 0810, 0811, 0812, 0813, and SMI-PW02 Time versus Ammonia Concentration Plot

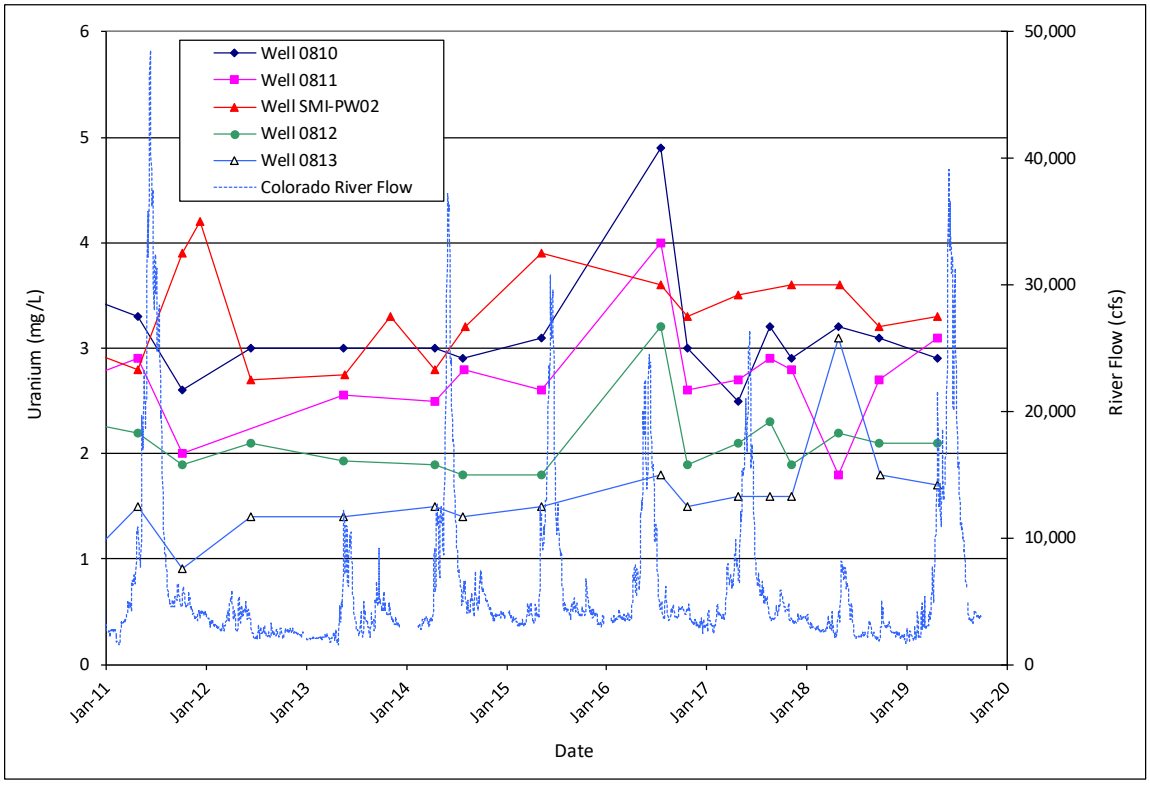

Figure 10. CF5 Extraction Wells 0810, 0811, 0812, 0813, and SMI-PW02 Time versus Uranium Concentration Plot

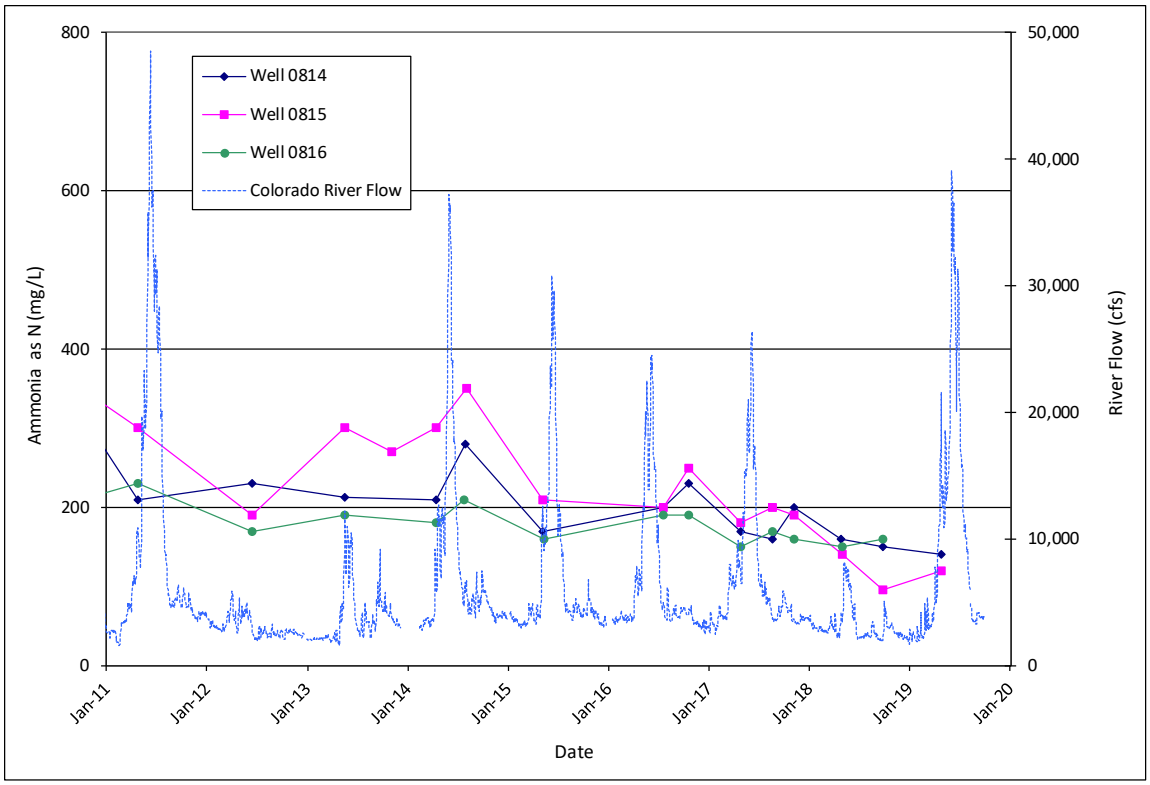

Figure 11. CF5 Extraction Wells 0814, 0815, and 0816 Time versus Ammonia Concentration Plot

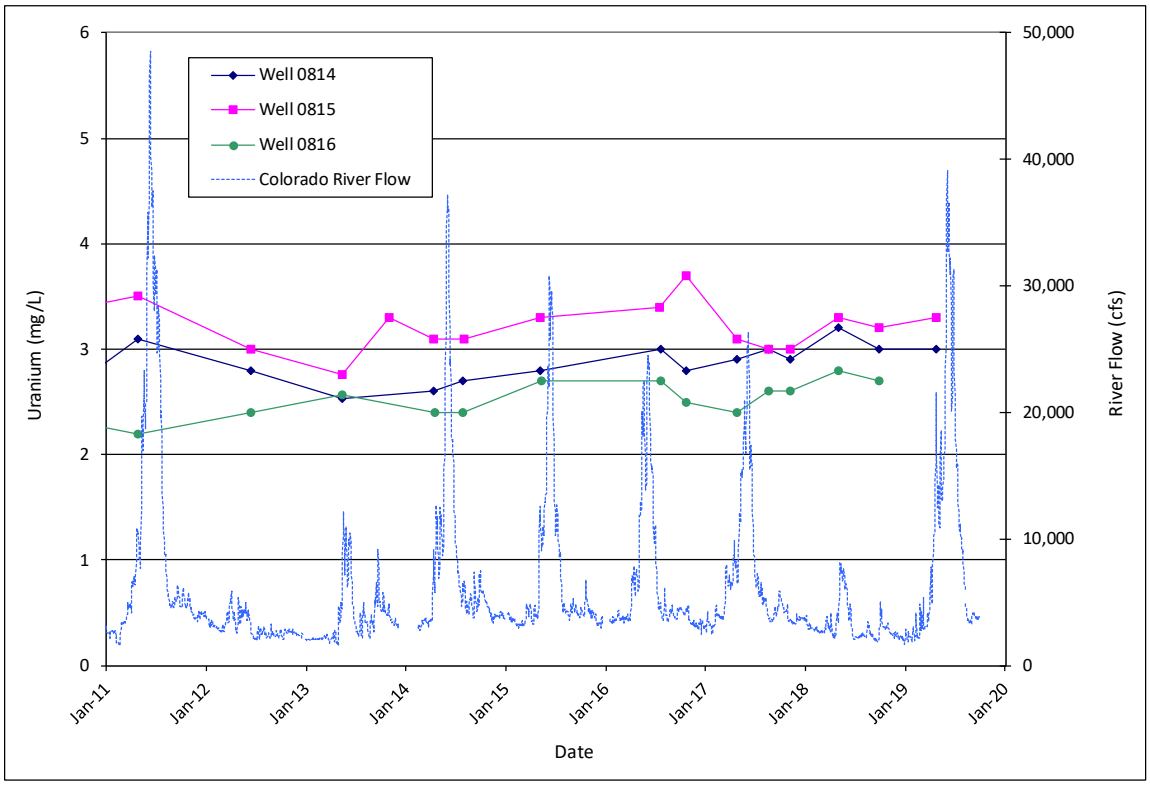

Figure 12. CF5 Extraction Wells 0814, 0815, and 0816 Time versus Uranium Concentration Plot

Table 18 includes the locations from the other sampling events from January to June 2019 that exceeded this concentration.

Table 18. January through June 2018 Sampling Events, Groundwater Locations Exceeding the 0.044 mg/L Uranium Groundwater Standard

Well Number	Date	Location	Sample Depth (ft bgs)	Uranium Concentration (mg/L)
0401	6/6/2019	CF2	18	1.8
0403	6/6/2019	CF1	18	0.72
0404	6/6/2019	CF3	18	1.6
0406	5/16/2019	CF1	18	1
0407	6/6/2019	CF1	18	0.98
0410	6/12/2019	NE Uranium Plume Area	23.5	0.42
0411	6/12/2019	NE Uranium Plume Area	8	0.57
0412	5/6/2019	NE Uranium Plume Area	10	3
0413	5/7/2019	NE Uranium Plume Area	10	4.2
0414	5/7/2019	NE Uranium Plume Area	7.5	2.9
0437	1/23/2019	On Tailings Pile	NA	2.6
	5/30/2019			2.3
0439	1/23/2019	On Tailings Pile	NA	1.3
	5/21/2019			1.4
0453	1/15/2019	Along SW Site Boundary	80	2.5
	5/21/2019			0.66
0454	5/29/2019	Along SW Site Boundary	13	0.89
0492	1/14/2019	Along S Site Boundary	18	2.5
0780	1/14/2019	CF4	28	1.3
0781	1/14/2019	CF4	48	1.3
	4/25/2019			2.8
0782	1/14/2019	CF4	33	2.6
	4/25/2019			0.63
0783	1/14/2019	CF4	18	0.4
	4/25/2019			0.082
0784	4/29/2019	CF4	18	0.066
0785	1/14/2019	CF4	18	0.084
	4/29/2019			0.07
0786	1/14/2019	CF4	28	2.7
	4/29/2019			0.072
0787	1/14/2019	CF4	36	1.9
	4/29/2019			1.6
0810	4/30/2019	CF5 Extraction Well	10 to 40	2.9
0811	4/30/2019	CF5 Extraction Well	9 to 39	3.1
0812	4/30/2019	CF5 Extraction Well	14 to 44	2.1
0813	5/2/2019	CF5 Extraction Well	14 to 44	1.7

Table 18. January through June 2018 Sampling Events, Groundwater Locations Exceeding the 0.044 mg/L Uranium Groundwater Standard (continued)

Well Number	Date	Location	Sample Depth (ft bgs)	Uranium Concentration (mg/L)
0814	5/2/2019	CF5 Extraction Well	12 to 42	3
0815	5/2/2019	CF5 Extraction Well	22 to 52	3.3
AMM-2	5/9/2019	Near CF5	48	2.6
MW-3	5/16/2019	Near CF5	44	2.8
SMI-MW01	5/6/2019	NE Uranium Plume Area	16	3.2
SMI-PW01	5/14/2019	CF5 Vicinity	40	2.1
SMI-PW02	4/30/2019	CF5 Extraction Well	20 to 60	3.3
SMI-PZ1D2	5/14/2019	CF5 Vicinity	73	1.1
SMI-PZ1M	5/9/2019	CF5 Vicinity	57	3
SMI-PZ1S	5/9/2019	CF5 Vicinity	18	1.3
SMI-PZ2D	5/9/2019	CF5 Vicinity	75	0.29
SMI-PZ2M2	5/9/2019	CF5 Vicinity	56	1.4
SMI-PZ3S	6/12/2019	NE Uranium Plume Area	25	1.5
TP-22	5/7/2019	NE Uranium Plume Area	17	0.33
TP-23	5/9/2019	NE Uranium Plume Area	25	2.3
UPD-17	6/12/2019	NE Uranium Plume Area	14	1.3
UPD-18	6/12/2019	NE Uranium Plume Area	13	1.2
UPD-20	6/12/2019	NE Uranium Plume Area	17	0.056
UPD-21	6/13/2019	NE Uranium Plume Area	25	5.4
UPD-22	5/7/2019	NE Uranium Plume Area	9	2.3
UPD-23	5/16/2019	NE Uranium Plume Area	26	0.58
UPD-24	6/13/2019	NE Uranium Plume Area	27	5.1

NE = northeastern; SW = southwestern

4.4.1 Northeastern Base of Tailings Pile

Figures 13 and 14 are time versus ammonia and uranium concentration plots, respectively, for locations UPD-17 and UPD-18.

Because of these locations' proximity to the Colorado River and Moab Wash (in which the Colorado River tends to flood during peak runoff), ammonia concentrations have displayed a general trend of higher ammonia concentrations during river base flows and, conversely, lower concentrations during the spring runoff or higher flows. Ammonia concentrations have gradually decreased since December 2017 in the samples collected from these two locations.

Uranium concentrations also have seasonally fluctuated, especially in the samples collected from well UPD-18. Results from the most recent event indicate the uranium concentrations were nearly identical, ranging between 1.2 and 1.3 mg/L.

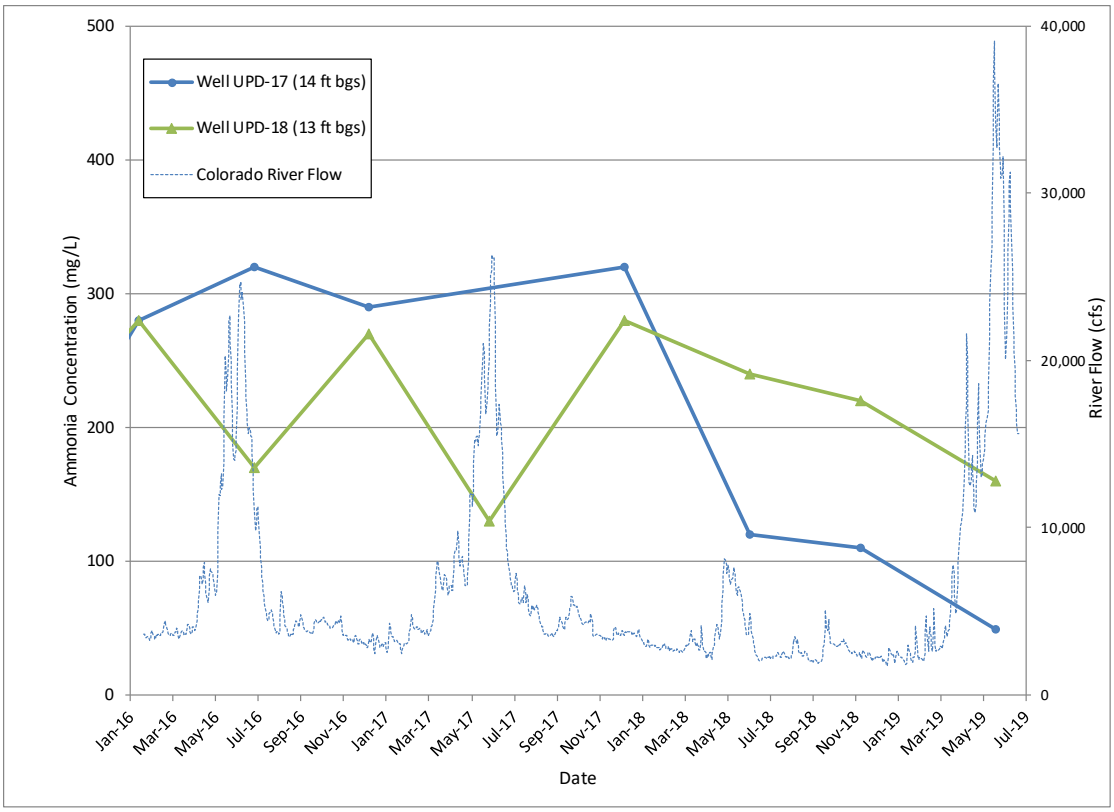

Figure 13. Wells UPD-17 and UPD-18 Time versus Ammonia Concentration Plot

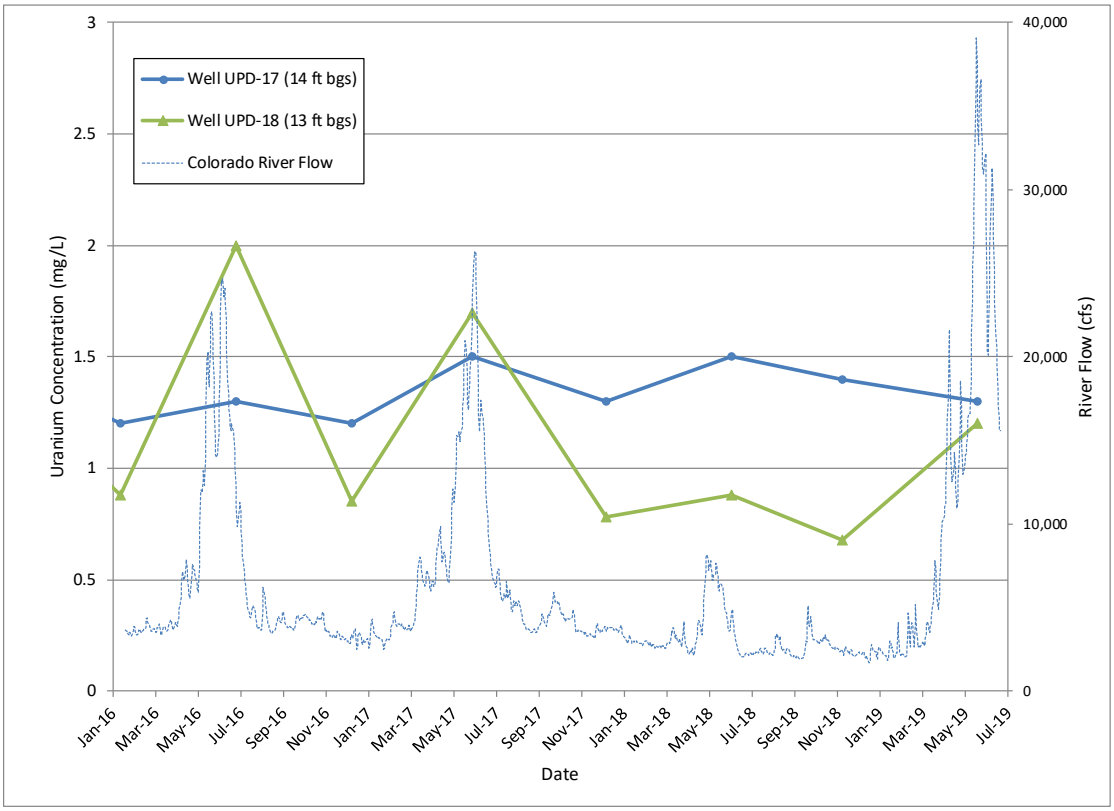

Figure 14. Wells UPD-17 and UPD-18 Time versus Uranium Concentration Plot

4.4.2 Northeastern Uranium Plume Area

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

4.4.3 Center of Northeastern Uranium Plume Area

Figures 15 and 16 are the time versus ammonia and uranium concentration plots, respectively, for the center of the northeastern uranium plume area, which includes locations 0413, 0414, and UPD-20. A sufficient volume of water was present in well 0411 to collect a sample for the first time since June 2017.

As displayed in Figure 15, the ammonia concentrations continue to remain below the detection limit in the samples collected from well UPD-20. Ammonia concentrations in the samples collected from locations 0411, 0413, and 0414 during the recent sampling event are within their respective historical ranges.

The uranium concentration in the sample collected from well UPD-20 was again just above the 0.044 mg/L standard, with a concentration of 0.056 mg/L. In the past two years, the concentration has ranged from 0.067 to 0.056 mg/L. The uranium concentrations in the sample collected from well 0413 increased from 2.9 to 4.2 since the previous event, while the concentration in the sample collected from well 0414 decreased from 3.6 to 2.9 (Figure 16).

4.4.4 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 17 and 18, respectively. These wells include 0410, UPD-21, UPD-23, and UPD-24.

As shown in Figure 17, the ammonia concentrations in the samples collected from wells 0410, UPD-21, and UPD-23 decreased since December 2018, with the most significant change associated with the UPD-23 sample, which decreased from 7.3 to 0.7 mg/L. The concentration did not change in the sample from well UPD-24. Ammonia concentrations in this area of the plume have remained below 10 mg/L since 2012.

The uranium concentrations (Figure 18) in samples collected from wells 0410 and UPD-23 remain lower than 1.0 mg/L and have not significantly changed since 2016. The uranium concentrations in the samples from locations UPD-21 and UPD-24 did not significantly change (from 5.2 to 5.4 mg/L and from 5.2 to 5.1 mg/L, respectively) compared to the previous event.

4.4.5 Northeastern Edge of Uranium Plume Area

Figures 19 and 20 display ammonia and uranium concentration 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).

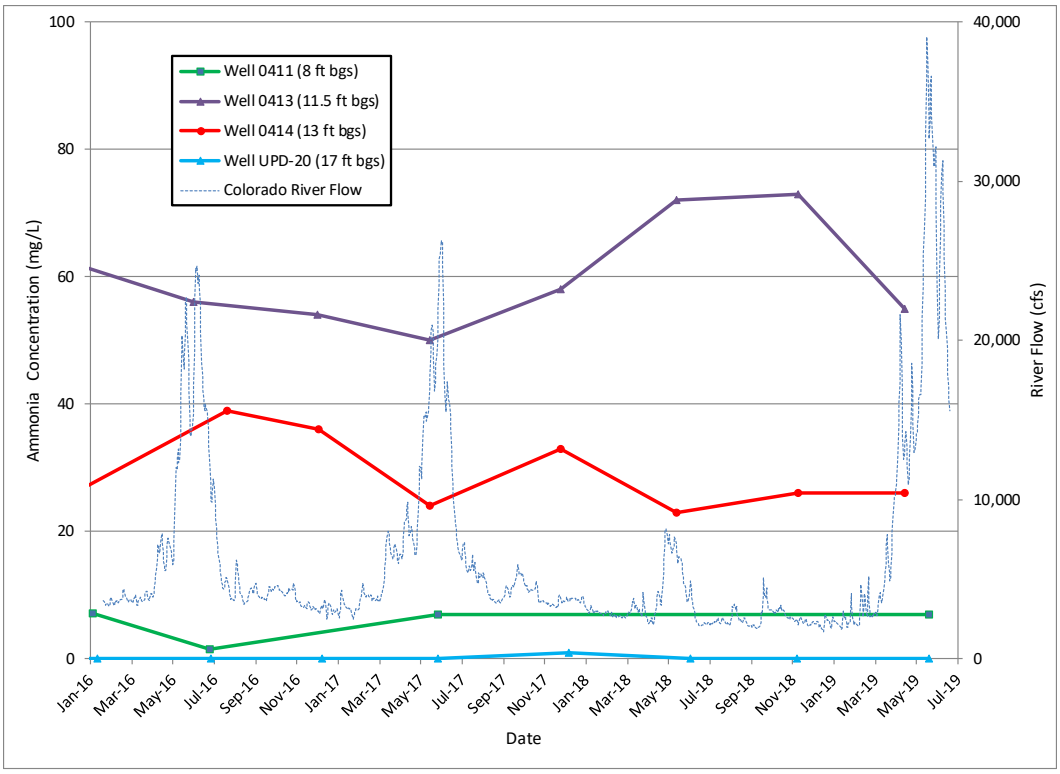

Figure 15. Center of Northeastern Uranium Plume Area Observation Wells 0411, 0413, 0414, and UPD-20 Time versus Ammonia Concentration Plot

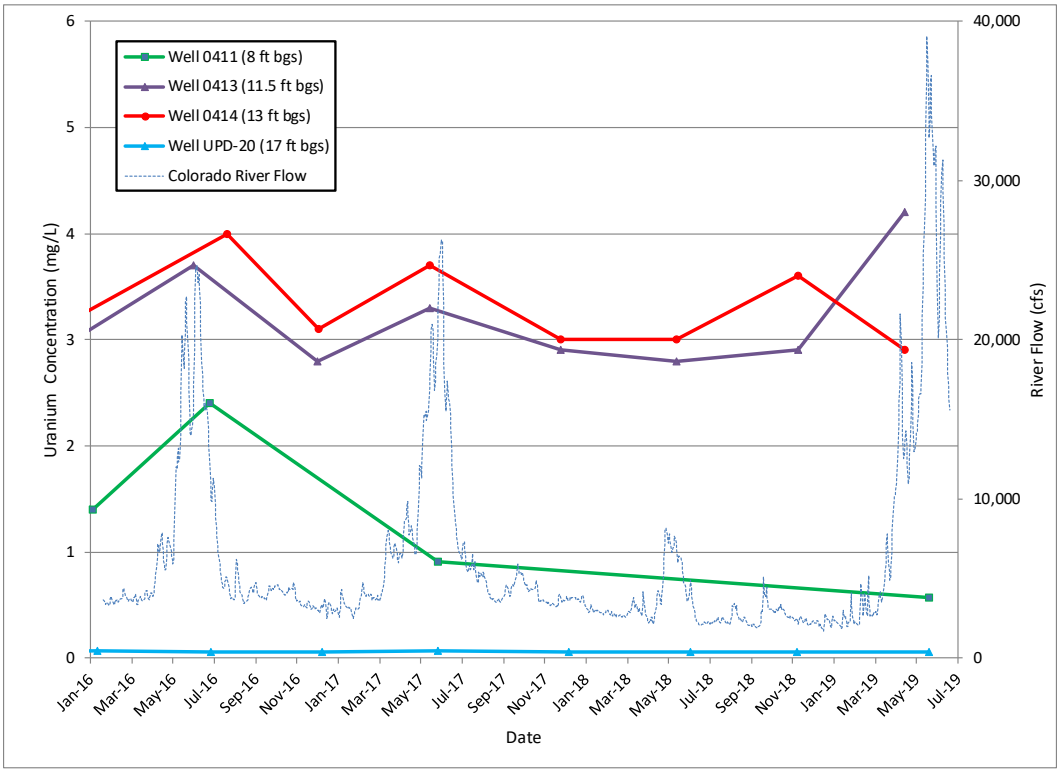

Figure 16. Center of Northeastern Uranium Plume Area Observation Wells 0411, 0413, 0414, and UPD-20 Time versus Uranium Concentration Plot

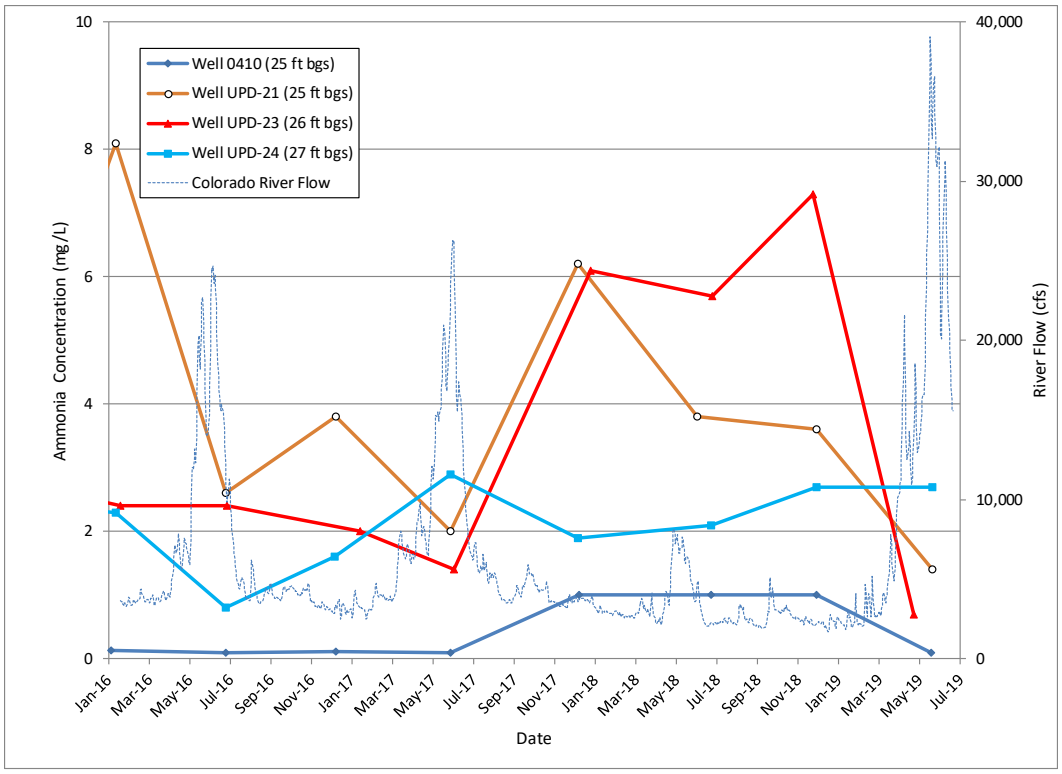

Figure 17. Vicinity of Atlas Building Observation Wells 0410, UPD-21, UPD-23, and UPD-24 Time versus Ammonia Concentration Plot

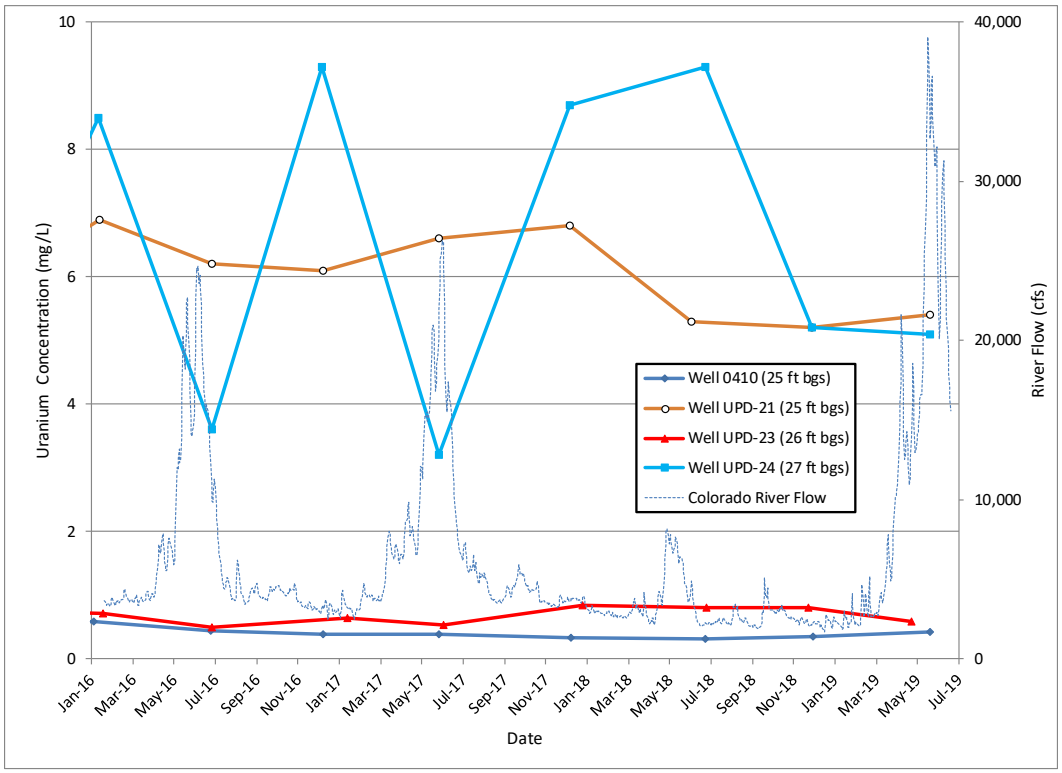

Figure 18. Vicinity of Atlas Building Observation Wells 0410, UPD-21, UPD-23, and UPD-24 Time versus Uranium Concentration Plot

As Figure 19 exhibits, the ammonia concentrations associated with the sampling of wells UPD-22, SMI-PZ3S, and 0412 did not significantly change since the previous event. The sample collected from SMI-MW01 contained an ammonia concentration that was within the historical range.

The increase of the ammonia concentration between May 2017 and the most recent event in the sample from well 0412 is a function of a change in the detection limit (1.0 as opposed to 0.1 mg/L). Similar to the samples collected in the vicinity of the Atlas building, all the concentrations in this area of the plume are below 10 mg/L ammonia.

The uranium concentrations (Figure 20) in the samples collected from wells 0412 slightly increased compared to the previous event, while the concentrations in the samples from SMI-MW01 and SMI-PZ3S increased (0.1 and 0.75 mg/L, respectively). Uranium concentrations in the sample collected from UPD-22 did not change compared to the previous event, and the concentration in the sample collected from SMI-PZ3S has remained below 2.0 mg/L since 2016.

4.4.6 Base of Tailings Pile

The time versus ammonia and uranium concentration plots for the area near the base of the tailings pile are presented in Figures 21 and 22 for wells AMM-3, ATP-2-S, ATP-2-D, and MW-3 (listed from south to north). A sample was not collected during this most recent event from AMM-3. As Figure 21 exhibits, the ammonia concentrations measured from the remaining locations during the most recent sampling event suggest a slight decrease since the December 2018 event.

Uranium concentrations in wells ATP-2-S, with a sample depth 25 ft bgs, and ATP-2-D (sample depth 88 ft bgs) have been less than 0.015 mg/L since 2010. Figure 22 displays the uranium concentrations associated with the samples collected from well MW-3 have gradually increased from 2.6 to 3.0 mg/L between December 2016 and December 2018, but decreased during the most recent event from 3.0 to 2.8 mg/L.

4.4.7 Southwestern Boundary

Figures 23 and 24 are time versus concentration plots for ammonia and uranium, respectively, for locations 0441, 0440, 0453, and 0454 (listed from northwest to southeast or from upgradient to downgradient groundwater flow direction) along the southwestern site boundary.

Both wells 0453 and 0454 ammonia concentrations (Figure 23) have seasonally fluctuated, and that trend continued during this most recent sampling event. Concentrations in the samples collected from these location decreased significantly from 410 to 110 mg/L and 420 to 55 mg/L, respectively, since the previous event. The ammonia concentration in the samples collected from wells 0440 and 0441 (the upgradient locations) have been at or below the 0.1 mg/L detection limit since 2010.

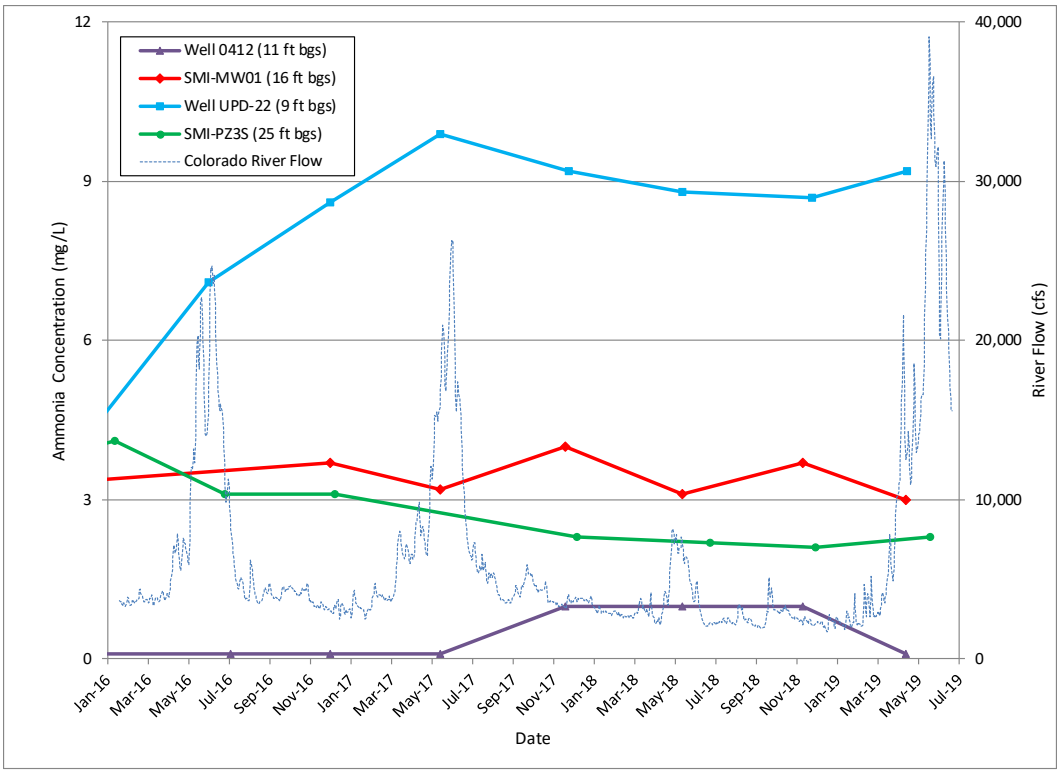

Figure 19. Northeastern Edge of Uranium Plume Area Observation Wells 0412, SMI-MW01, SMI-PZ3S, and UPD-22 Time versus Ammonia Concentration Plot

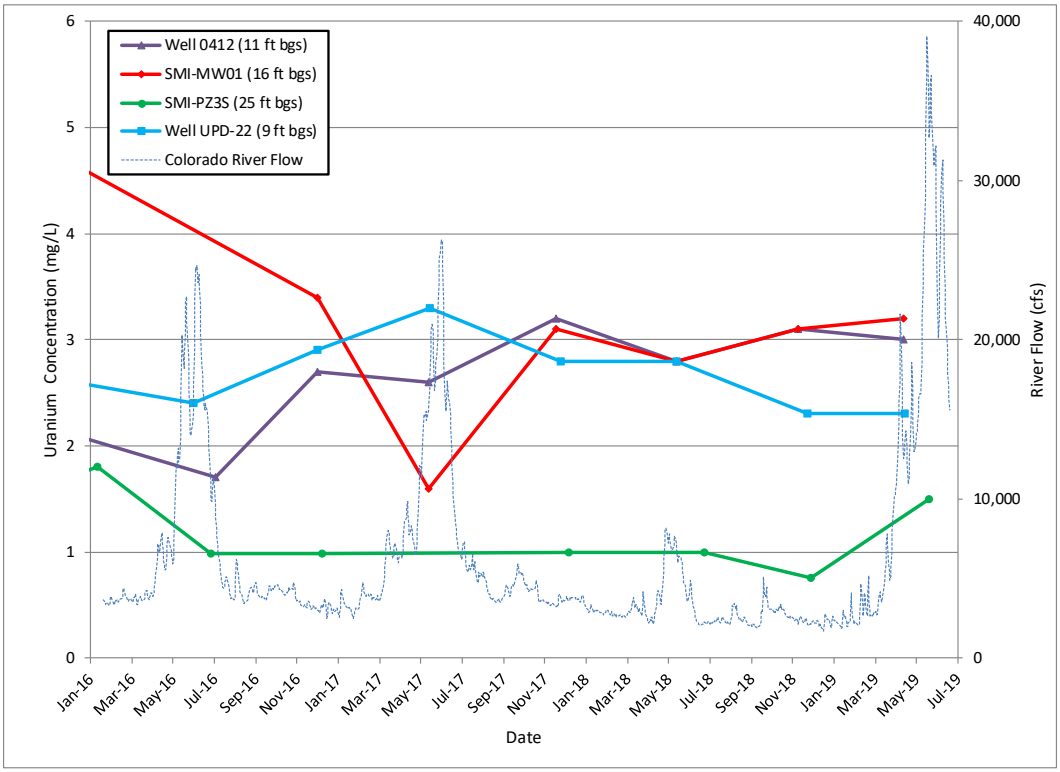

Figure 20. Northeastern Edge of Uranium Plume Area Observation Wells 0412, SMI-MW01, SMI-PZ3S, and UPD-22 Time versus Uranium Concentration Plot

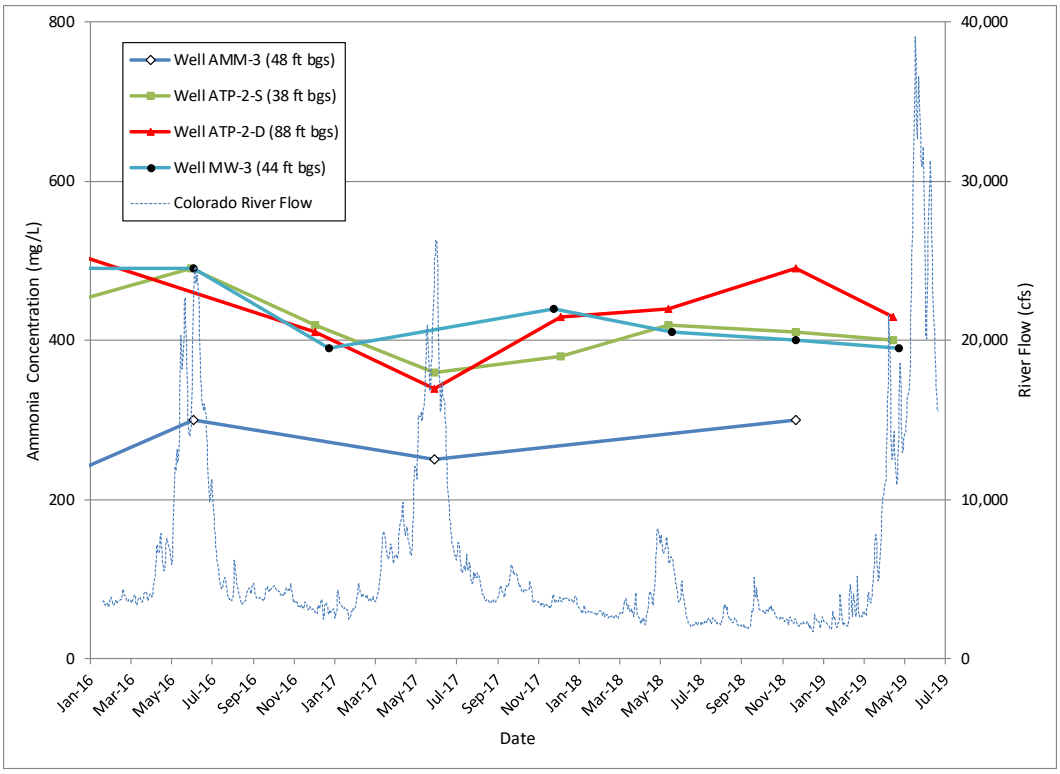

Figure 21. Base of Tailings Pile Observation Wells AMM-3, ATP-2-S, ATP-2-D, and MW-3 Time versus Ammonia Concentration Plot

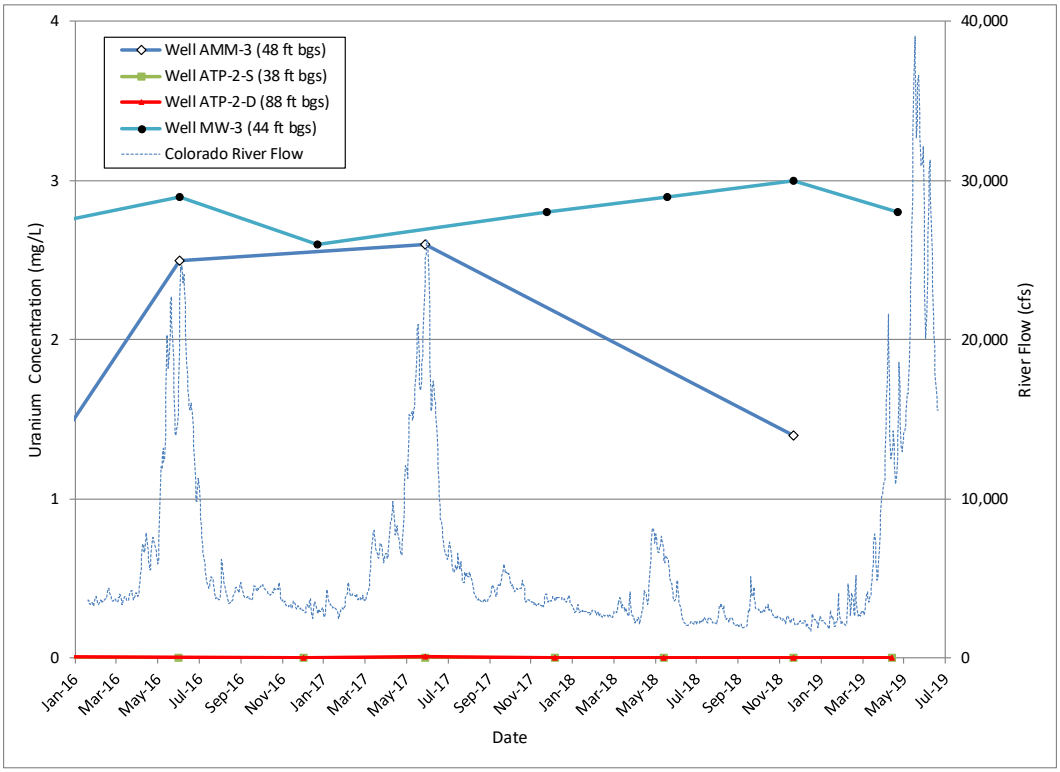

Figure 22. Base of Tailings Pile Observation Wells AMM-3, ATP-2-S, ATP-2-D, and MW-3 Time versus Uranium Concentration Plot

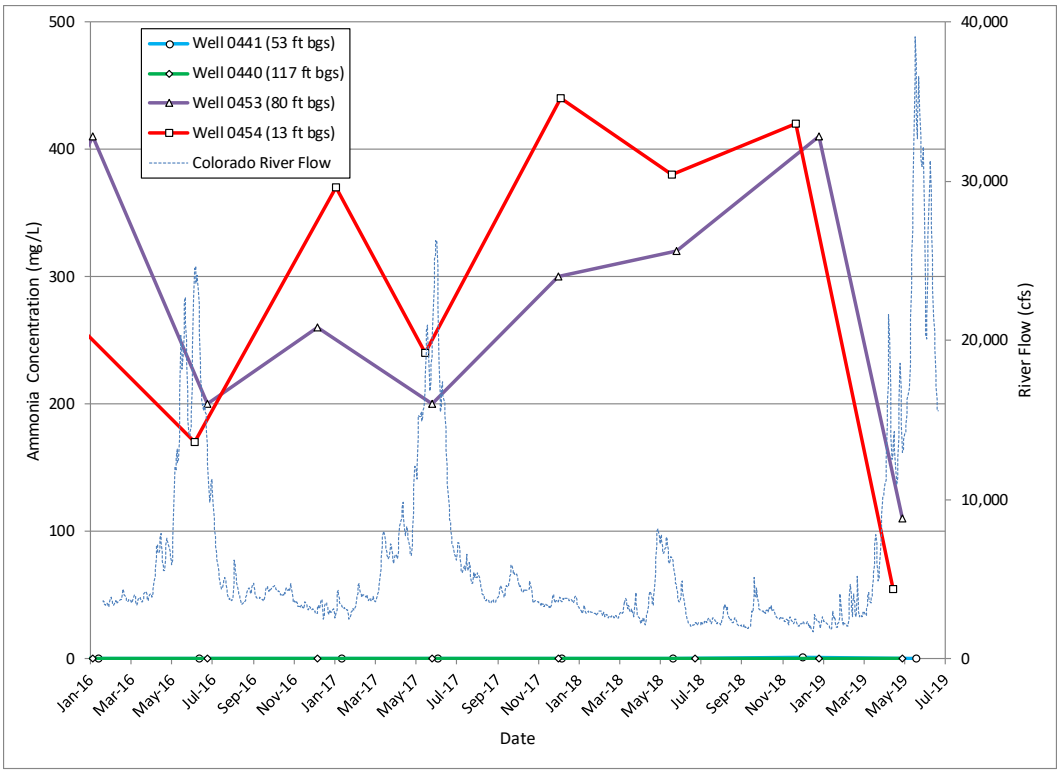

Figure 23. Southwestern Boundary Observation Wells 0453, 0454, and 0440 Time versus Ammonia Concentration Plot

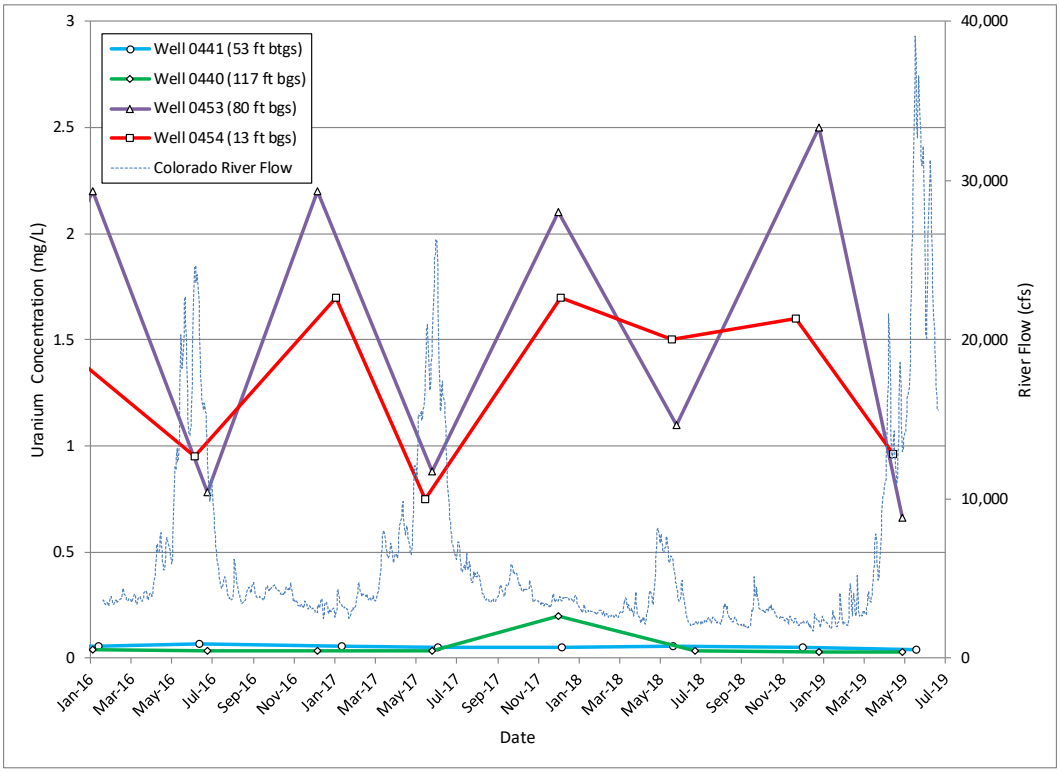

Figure 24. Southwestern Boundary Observation Wells 0453, 0454, and 0440 Time versus Uranium Concentration Plot

Wells 0453 and 0454 uranium concentrations (Figure 24) display a similar trend to the ammonia concentrations, with significant decreases in the concentrations associated with the samples collected from well 0453 and 0454. The samples collected from wells 0440 (0.031 mg/L) and 0440 (0.039 mg/L) are below the 0.044 mg/L uranium UMTRA standard.

4.4.8 Riverbank Area

Figures 25 and 26 are the time versus ammonia and uranium concentration plots, respectively, for the locations sampled along the riverbank, presented from the south to the north (wells TP-17, 0492, 0407, 0401, 0404, and TP-01). Because these wells are located along the riverbank, their water chemistry has historically been heavily influenced by the seasonal changes of the Colorado River stage.

From May 2017 to June 2018, the ammonia concentration associated with well 0407 has gradually increased from 12 to 300 mg/L, and during then decreased down to 40 mg/L during this most recent event (Figure 25). Other locations have displayed a similar trend, with the ammonia concentration measured in the sample from well 0404 has decreased from 670 to 470 mg/L. Of this group of wells, only the sample collected from location 0401 had an increase (from 330 to 380 mg/L) since the previous event. The lowest ammonia concentrations were associated with the samples collected from the wells farthest to the north (well TP-01, below the 0.1 mg/L detection limit) and to the south along the site (well TP-17, 2.2 mg/L).

As displayed in Figure 26, the uranium concentrations associated with the samples collected from each of these wells has decreased or remained the same (well 0404) compared to the previous sampling event.
The uranium concentration in the sample collected from well 0492 has gradually increased since May 2017 from 0.22 to 2.0 mg/L, and decreased during this last event to 0.9 mg/L. As displayed in the ammonia plot, the most southern and northern wells have the lowest uranium concentrations and are below the UMTRA standard.

4.4.9 Southern and Off-site Areas

Figures 27 and 28 are the plots for the two locations sampled south of the site, wells TP-17 and TP-20. Well TP-17 is located along the riverbank, and TP-20 is located approximately 500 ft off the riverbank. Typically, contaminant concentrations are low in samples collected from these wells because they are located along the southern edge of the contaminant plumes.

Ammonia concentrations (Figure 27) in both wells did increase during the recent event, but compared to other locations, the concentrations are very low (less than 5 mg/L). Typically, wells located along the riverbank display a well-defined impact of changes in the river stage (lower concentrations during higher runoff flows and higher concentrations during base flows). However, both wells TP-17 and TP-20 are located in the area of the site where the brine unit is very shallow, as evidenced by a specific conductance above 83,000 micro ohms per centimeter (µmhos/cm) at a depth of just 28 ft bgs, and more than 127,000 µmhos/cm at a depth 32 ft bgs for wells TP-17 and -20, respectively.

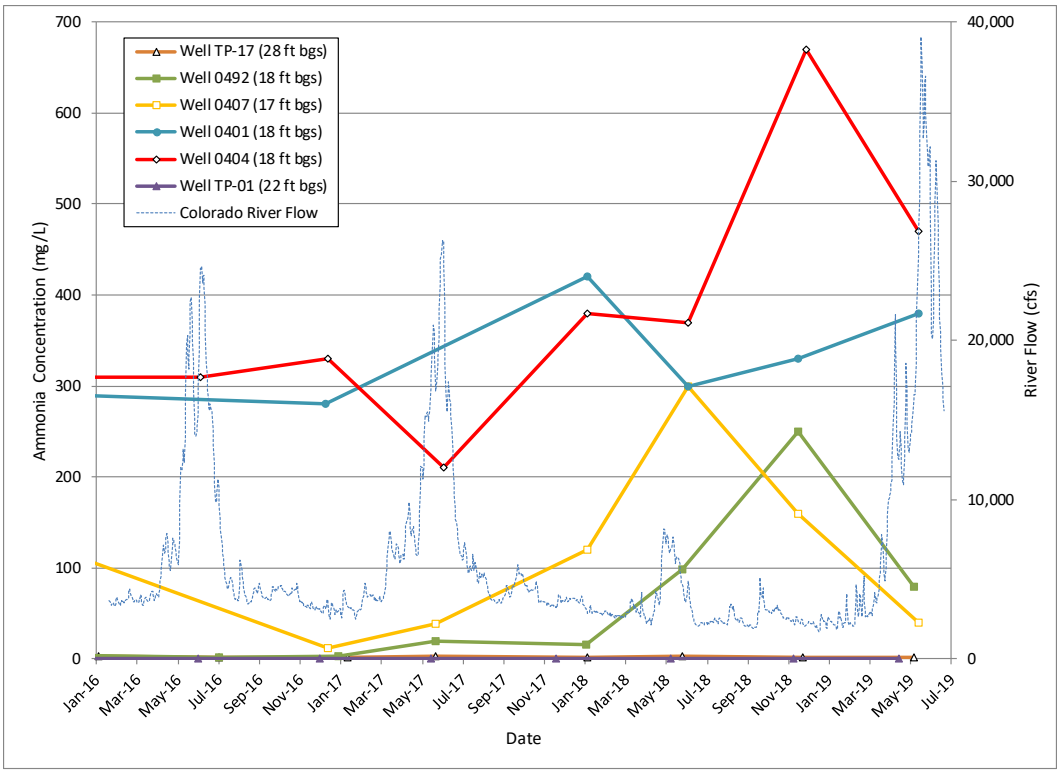

Figure 25. Riverbank Observation Wells TP-17, 0492, 0407, 0401, 0404, and TP-01 Time versus Ammonia Concentration Plot

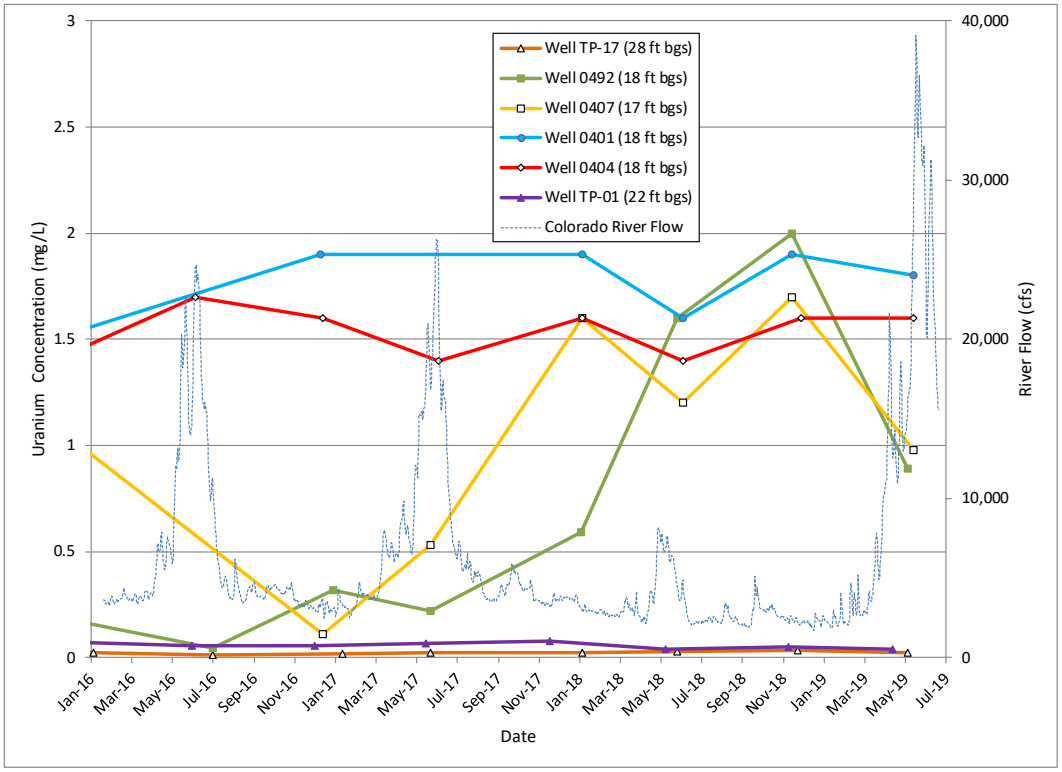

Figure 26. Riverbank Observation Wells TP-17, 0492, 0407, 0401, 0404, and TP-01 Time versus Uranium Concentration Plot

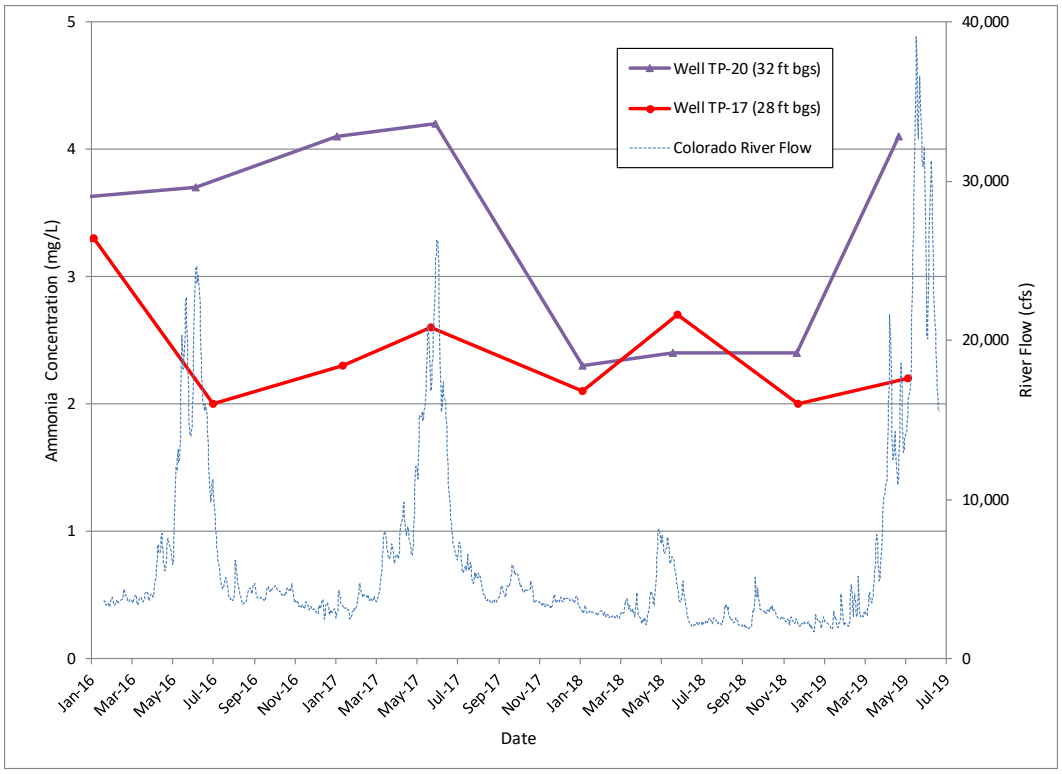

Figure 27. South of Site Observation Wells TP-17 and TP-20 Time versus Ammonia Concentration Plot

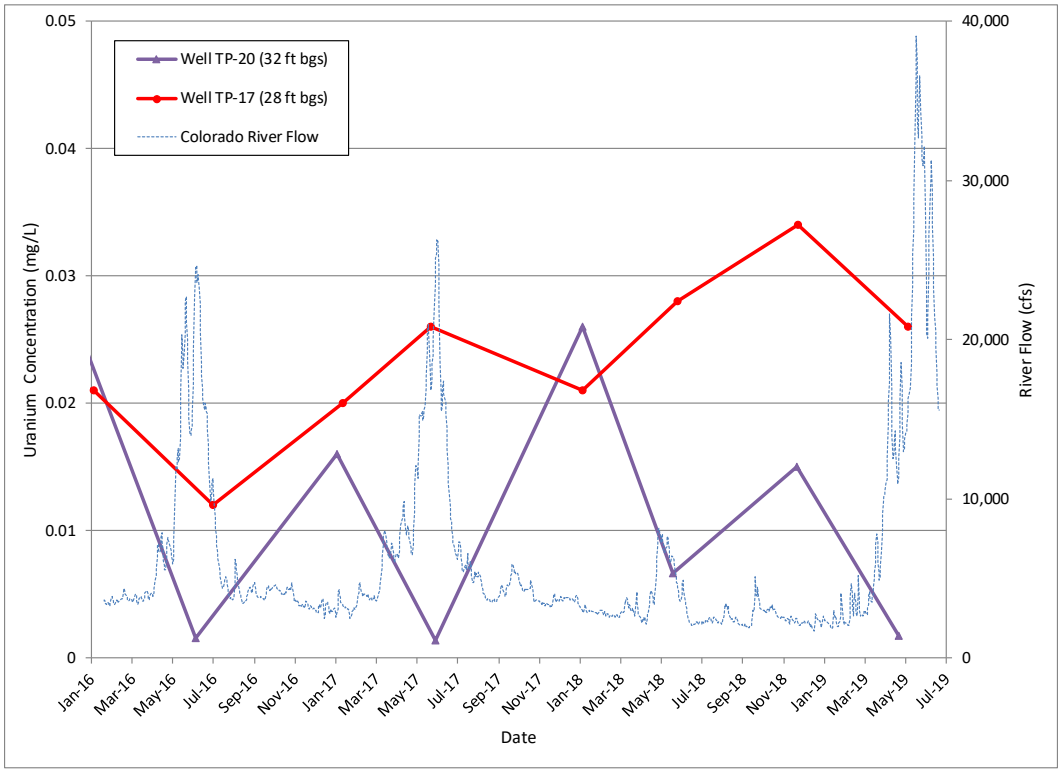

Figure 28. South of Site Observation Wells TP-17 and TP-20 Time versus Uranium Concentration Plot

The combination of the shallow brine (contaminants in general do not migrate into these areas due to groundwater density differences) and the wells located near the edge of the plume result in very low ammonia concentrations. The uranium concentrations (Figure 28) associated with the samples collected from these locations continue to remain below the 0.044 mg/L UMTRA standard since 2008.

4.4.10 SMI-PW01 Cluster

During this most recent sampling event, all four wells associated with the SMI-PW01 cluster were sampled, with samples collected at 18 (SMI-PZ1S), 40 (SMI-PW01), 57 (SMI-PZ1M), and 73 (SMI-PZ1D2) ft bgs. Figures 29 and 30 are the plots displaying the ammonia and uranium concentrations measured at these various depths.

Contaminant concentrations tend to increase with depth in the groundwater system in this area of the site. As displayed in Figure 29, the sampling associated with this well cluster follows this trend, with the ammonia concentration increasing from 230 mg/L at a depth of 18 ft bgs to 1,300 mg/L at a depth of 73 ft bgs.

The uranium concentrations generally follow the same trend. Over the past three sampling events, the uranium concentration in the sample collected from 18 ft bgs has been higher compared to the concentration in the sample collected from 40 ft bgs (1.3 compared to 1.1 mg/L). At a depth of 73 ft bgs, the concentration was up to 3.0 mg/L.

4.4.11 Surface Water Sampling Results

Table 19 presents the ammonia results from the surface water sampling as part of this sampling event, with the samples collected in late-May 2019 from locations 0201, 0218, 0226, 0274, CR1, CR2, CR3, and CR5 (as shown in Figure 30). The ammonia concentrations 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 19.

Table 19. May/June 2019 Site-wide Surface Water Ammonia Concentrations and Comparisons to EPA Acute and Chronic Criteria

Location	Date	Temp (ºC)	pH	Ammonia as N (mg/L)	EPA - Acute Total as N (mg/L)*	EPA - Chronic Total as N (mg/L)**
0201	5/30/19	14.74	7.97	<0.1	8.8	1.1
0218	5/28/19	14.48	8.05	<0.1	8.8	1.1
0226	5/29/19	14.18	8.48	<0.1	3.3	0.51
0274	5/29/19	13.86	7.62	<0.1	8.8	1.9
CR1	5/28/19	14.24	7.59	<0.1	18	1.7
CR2	5/28/19	15.06	8.14	<0.1	7.3	0.92
CR3	5/29/19	14.07	8.02	<0.1	8.8	1.1
CR5	5/30/19	14.17	8.26	<0.1	4.9	0.72

*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)
**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)

The ammonia concentrations measured during this event were below the 0.1 mg/L detection limit. All surface water ammonia concentrations are below the applicable EPA criteria (for a suitable habitat) for both acute and chronic concentrations.

4.5 Groundwater Surface Elevation

Water level data to generate the groundwater surface contour map were collected between May 13 and 14, 2019, when the Colorado River mean daily flows ranged from 10,900 to 11,400 cubic feet per second, and the river stage at the southern end of the site only ranged from 3,957.1 to 3,957.3 feet above mean sea level. Because river elevations fluctuated only 0.2 ft during this time period, it was possible to use this water level data collected during this time frame to generate the groundwater surface contour map displayed in Figure 31.

This contour map displays how the site groundwater system responds to the river during primarily losing conditions, when fresh water migrates into the groundwater system. Groundwater flow direction and the gradient displayed in this contour map are comparable to historical contour maps generated using groundwater data collected during river spring runoff conditions.

4.6 Contaminant Distribution

Figures 32 and 33 are maps showing shallow groundwater ammonia and uranium plumes, respectively, using data collected during the May/June 2019 site-wide events. Contaminant distribution is generally comparable to previous plume maps generated using data collected during the past two years.

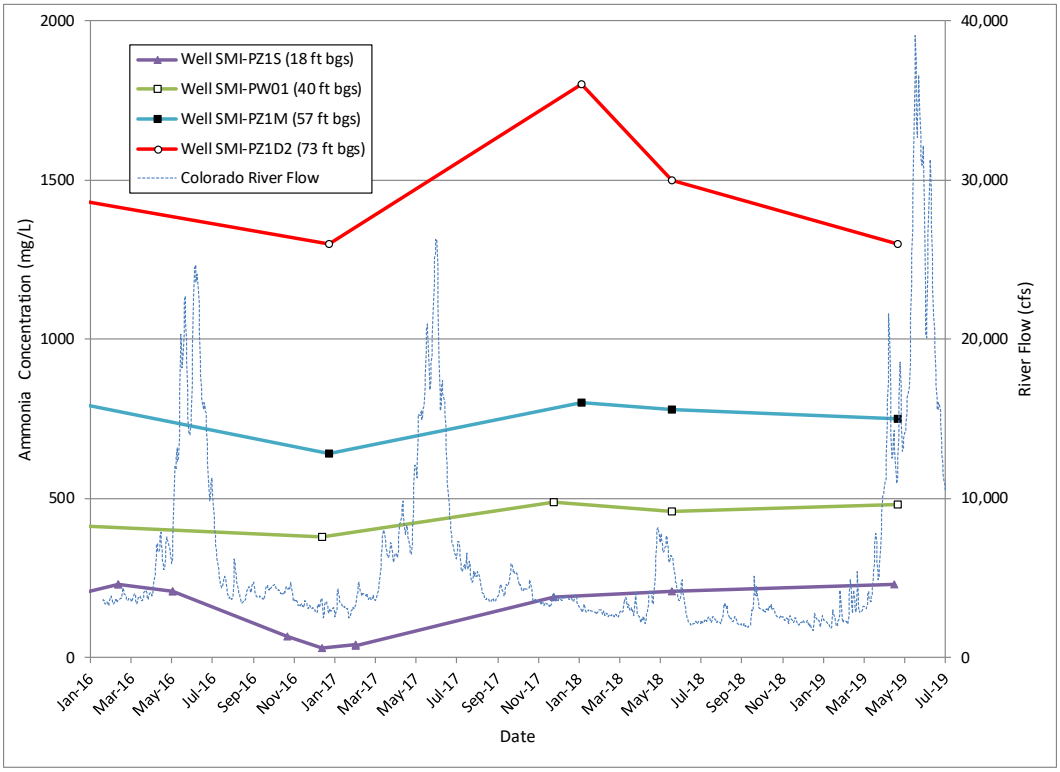

Figure 29. SMI-PW01 Well Cluster Time versus Ammonia Concentration Plot

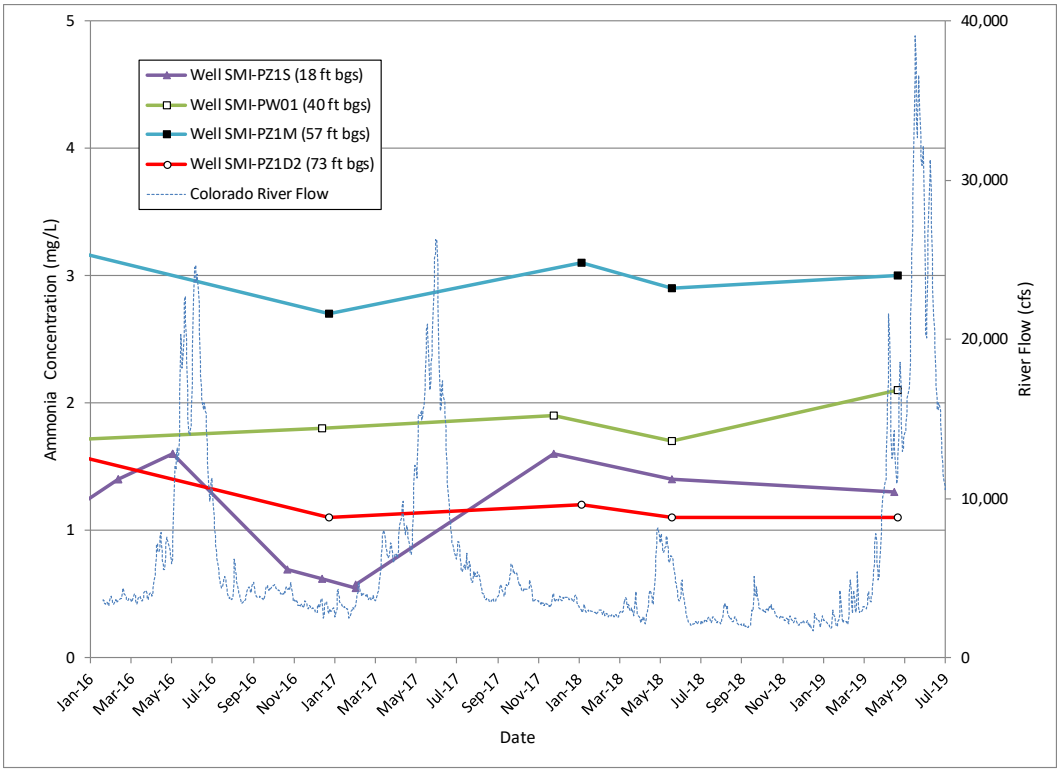

Figure 30. SMI-PW01 Well Cluster Time versus Uranium Concentration Plot

5.0 Conclusions

This report presents the results of sampling conducted at the Moab and Crescent Junction sites between January and June 2019. The primary contaminants of interest are ammonia and uranium, and, while there is no EPA drinking water standard maximum concentration level for ammonia, the UMTRA groundwater standard for uranium is 0.044 mg/L. This uranium standard was exceeded in at least one location for each of the Moab site sampling events. Refer to Table 18 for a complete list of the Moab site locations and associated uranium concentrations that exceeded the 0.044 mg/L uranium standard.

There were three anomalous data points associated with these January through June 2019 sampling events, two of which were the result of the most recent sampling event having a concentration significantly higher than the historic maximum (the Crescent Junction well 0205 U-235 concentration and the Moab well 0434 ammonia concentration). The third anomalous data point was the result of an ammonia concentration significantly below the historic minimum (Moab well UPD-23).

5.1 January 2019 CF4 Sampling Event

The collection of groundwater samples from monitoring wells surrounding the CF4 injection wells in January 2019 was to determine if the groundwater system was impacted by limited freshwater injection that occurred seven weeks prior to the sampling. The analytical results indicate there was evidence of reduced ammonia concentrations downgradient of the CF4 injection wells in the shallowest zones of groundwater system.

5.2 March 2019 Crescent Junction Sampling Event

The rationale for collecting the groundwater samples from Crescent Junction monitoring well 0205 was to determine if there were any changes to the source of the groundwater recharging this location. The sample was collected in March as part of the quarterly monitoring for the first quarter of 2019. In addition to the standard analytes, the samples were also analyzed for bicarbonate as $CaCO_3$, carbonate as $CaCO_3$, total alkalinity as $CaCO_3$, U-234, U-235, and U-238. The analyte concentrations measured in this sample indicate that well 0205 continues to be recharged from the same water source that was identified during previous sampling events.

5.3 April 2019 CF4/CF5 Sampling Event

The collection of groundwater samples from observation wells surrounding the CF4 injection wells in April 2019 was to evaluate the effectiveness of the injection system as it was actively injecting fresh water into the subsurface. The analytical results indicate the injection system reduced the ammonia concentrations in the groundwater system from 15 to 35 ft bgs in the vicinity of CF4 (Table 17), and the water elevation data confirmed more than 10 ft of mounding was generated from the operation of this system.

Seven CF5 wells were sampled to monitor contaminant concentration trends over time and update the contaminant concentrations used for the mass removal calculations. In general, ammonia and uranium concentrations have not significantly changed during the past five years. The data indicate the samples collected from the extraction wells located along CF5 southeastern boundary have the higher ammonia concentrations compared to the samples collected from the wells near the base of the tailings pile. No trends are apparent based on the uranium concentrations.

5.4 May/June 2019 Site-wide Sampling Event

The rationale for conducting the May/June 2019 site-wide sampling event was to collect data from the site during Colorado River spring runoff flows and to assess any changes or trends in the groundwater system water chemistry. The river flows represented the early flows of what developed into a higher than average peak spring runoff river flow. Surface water sampling was also conducted to assess surface water quality adjacent to the site compared to upstream and downstream water quality.

In general, with the exception of the locations in the vicinity of the Colorado River bank, the ammonia and uranium concentrations did not significantly change since the previous site-wide sampling event in November/December 2017. Ammonia concentrations from the eight surface water samples collected during this sampling event were below the 0.1 mg/L ammonia laboratory detection limit and below the applicable EPA criteria (for a suitable habitat) for both acute and chronic concentrations.

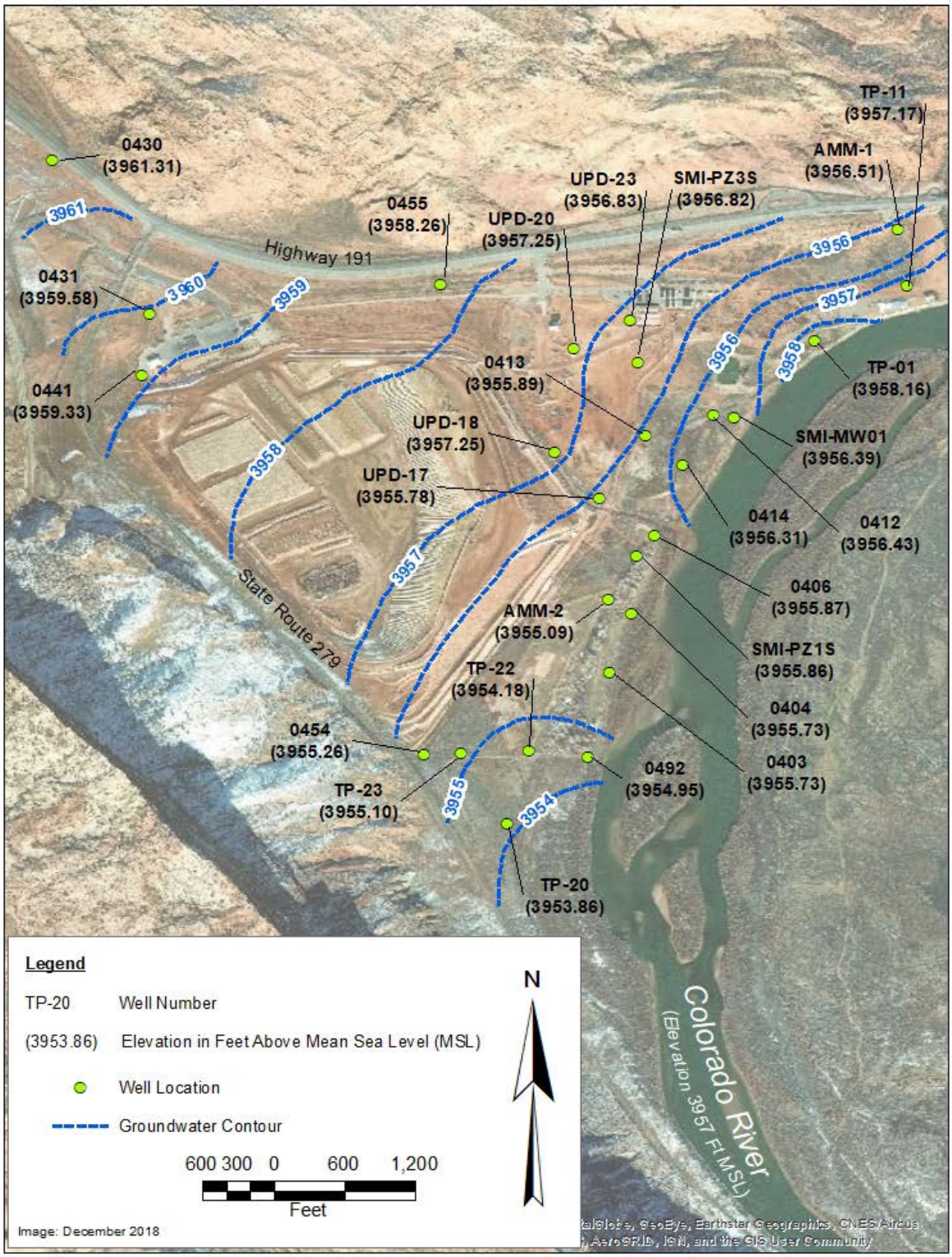

Figure 31. Site-wide Groundwater Elevations, May 13 and 14, 2019

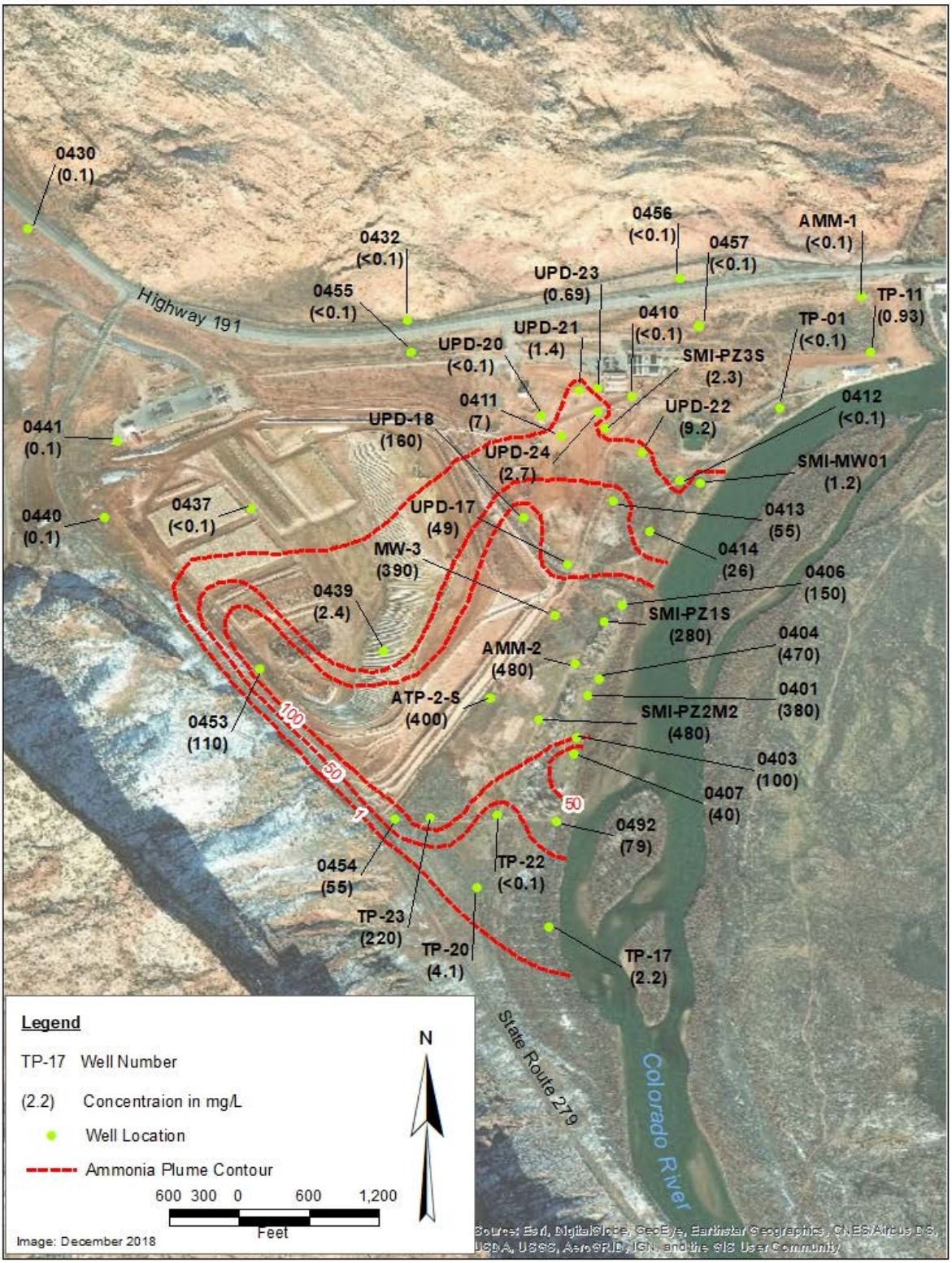

Figure 32. Ammonia Plume in Shallow Groundwater, May/June 2019

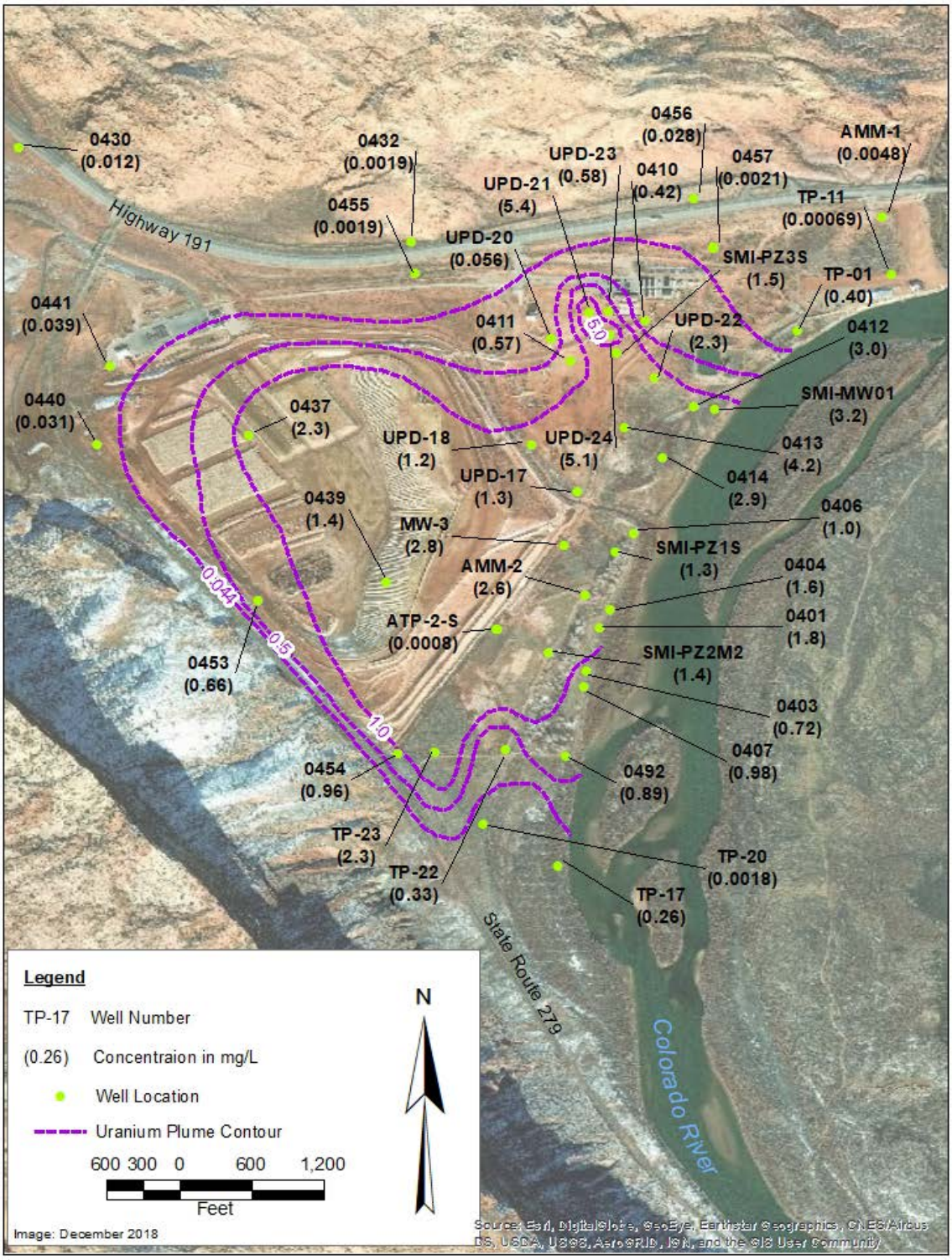

Figure 33. Uranium Plume in Shallow Groundwater, May/June 2019

6.0 References

40 CFR 192A (Code of Federal Regulations) Subpart A, “Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings, Standards for the Control of Residual Radioactive Materials from Inactive Uranium Processing Sites.”

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

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

Appendix A.
January 2019 CF4 Sampling Event

Water Sampling Field Activities Verification
Water Quality Data
Water Level Data
Trip Report

Appendix A. January 2019 CF4 Sampling Event

Water Sampling Field Activities Verification

Sampling Event/RIN	January 2019 CF4 Sampling Event /1901108	**Date(s) of Water Sampling**	January 14 – 23, 2019
Date(s) of Verification	April 15, 2019	**Name of Verifier**	Ken Pill

		Response (Yes, No, NA)	Comments
1.	Is the Sampling Analysis Plan (SAP) the primary document directing field procedures?	Yes	
	List other documents, standard operating procedures, instructions.	NA	
2.	Were the sampling locations specified in the planning documents sampled?	Yes	
3.	Was a pre-trip calibration conducted as specified in the aforementioned documents?	Yes	
4.	Was an operational check of the field equipment conducted in accordance with the SAP?	Yes	
	Did the operational checks meet criteria?	Yes	
5.	Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, oxidation reduction potential) of field measurements taken as specified?	Yes	Field measurements for temperature, pH, turbidity, oxidation reduction potential, and conductivity were collected.
6.	Was the category of the well documented?	No	Category not provided for well 0780 sample, historically Cat 1
7.	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?	Yes	
8.	Were the following conditions met when purging a Category II well:		
	Was the flow rate less than 500 milliliters per minute?	Yes	
	Was one pump/tubing volume removed before sampling?	Yes	
9.	Were duplicates taken at a frequency of one per 20 samples?	Yes	One duplicate sample was collected for 12 samples

Appendix A. January 2019 CF4 Sampling Event Sampling Event (*continued*)

Water Sampling Field Activities Verification (*continued*)

Sampling Event/RIN	January 2019 CF4 Sampling Event /1901108	**Date(s) of Water Sampling**	January 14 – 23, 2019
Date(s) of Verification	April 15, 2019	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
10. Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	All samples were collected using dedicated equipment.
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	Duplicate from 0786 given location 2000
13. Was the true identity of the samples recorded on the quality assurance sample log?	Yes	
14. Were samples collected in the containers specified?	Yes	
15. Were samples filtered and preserved as specified?	Yes	
16. Were the number and types of samples collected as specified?	Yes	
17. Were COC records completed, and was sample custody maintained?	Yes	
18. Are field data sheets signed and dated by both team members?	Yes	
19. Was all other pertinent information documented on the field data sheets?	Yes	
20. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
21. Were water levels measured at the locations specified in the planning documents?	Yes	

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0437 <well>

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/23/2019	0001	97.00	0.1	UN	J	#	0.1	-
Oxidation Reduction Potential	mV	01/23/2019	N001	97.00	212			#	-	-
pH	s.u.	01/23/2019	N001	97.00	7.33			#	-	-
Specific Conductance	umhos/cm	01/23/2019	N001	97.00	11944			#	-	-
Temperature	C	01/23/2019	N001	97.00	15.84			#	-	-
Turbidity	NTU	01/23/2019	N001	97.00	4.03			#	-	-
Uranium	mg/L	01/23/2019	0001	97.00	2.600		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0439 <well>

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/23/2019	0001	118.00	5.5		J	#	1	-
Oxidation Reduction Potential	mV	01/23/2019	N001	118.00	260			#	-	-
pH	s.u.	01/23/2019	N001	118.00	6.82			#	-	-
Specific Conductance	umhos/cm	01/23/2019	N001	118.00	10593			#	-	-
Temperature	C	01/23/2019	N001	118.00	13.50			#	-	-
Turbidity	NTU	01/23/2019	N001	118.00	19.10			#	-	-
Uranium	mg/L	01/23/2019	0001	118.00	1.300		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0440 <well>

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/15/2019	0001	117.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	01/15/2019	N001	117.00	189			#	-	-
pH	s.u.	01/15/2019	N001	117.00	6.67			#	-	-
Specific Conductance	umhos/cm	01/15/2019	N001	117.00	9312			#	-	-
Temperature	C	01/15/2019	N001	117.00	15.50			#	-	-
Turbidity	NTU	01/15/2019	N001	117.00	42.60			#	-	-
Uranium	mg/L	01/15/2019	0001	117.00	0.030		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0453 <well> Contaminated Area

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/15/2019	0001	80.00	410		J	#	10	-
Oxidation Reduction Potential	mV	01/15/2019	N001	80.00	115			#	-	-
pH	s.u.	01/15/2019	N001	80.00	6.87			#	-	-
Specific Conductance	umhos/cm	01/15/2019	N001	80.00	37163			#	-	-
Temperature	C	01/15/2019	N001	80.00	11.69			#	-	-
Turbidity	NTU	01/15/2019	N001	80.00	1.29			#	-	-
Uranium	mg/L	01/15/2019	0001	80.00	2.500		J	#	0.00012	-

Appendix A. January 2019 CF4 Sampling Event (*continued*)

Water Quality Data

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0780 <well> Configuration 4

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/14/2019	0001	28.00	330		J	#	10	-
Oxidation Reduction Potential	mV	01/14/2019	N001	28.00	127			#	-	-
pH	s.u.	01/14/2019	N001	28.00	6.79			#	-	-
Specific Conductance	umhos/cm	01/14/2019	N001	28.00	22321			#	-	-
Temperature	C	01/14/2019	N001	28.00	13.32			#	-	-
Turbidity	NTU	01/14/2019	N001	28.00	3.93			#	-	-
Uranium	mg/L	01/14/2019	0001	28.00	2.500		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0781 <well> Configuration 4

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/14/2019	0001	48.00	1900		J	#	50	-
Oxidation Reduction Potential	mV	01/14/2019	N001	48.00	133			#	-	-
pH	s.u.	01/14/2019	N001	48.00	6.60			#	-	-
Specific Conductance	umhos/cm	01/14/2019	N001	48.00	95617			#	-	-
Temperature	C	01/14/2019	N001	48.00	13.23			#	-	-
Turbidity	NTU	01/14/2019	N001	48.00	1.52			#	-	-
Uranium	mg/L	01/14/2019	0001	48.00	1.300		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0782 <well> Configuration 4

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/14/2019	0001	33.00	1100		J	#	50	-
Oxidation Reduction Potential	mV	01/14/2019	N001	33.00	106			#	-	-
pH	s.u.	01/14/2019	N001	33.00	6.73			#	-	-
Specific Conductance	umhos/cm	01/14/2019	N001	33.00	51204			#	-	-
Temperature	C	01/14/2019	N001	33.00	13.41			#	-	-
Turbidity	NTU	01/14/2019	N001	33.00	2.05			#	-	-
Uranium	mg/L	01/14/2019	0001	33.00	2.600		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0783 <well> Configuration 4

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/14/2019	0001	18.00	20		J	#	1	-
Oxidation Reduction Potential	mV	01/14/2019	N001	18.00	46			#	-	-
pH	s.u.	01/14/2019	N001	18.00	7.10			#	-	-
Specific Conductance	umhos/cm	01/14/2019	N001	18.00	5109			#	-	-
Temperature	C	01/14/2019	N001	18.00	14.76			#	-	-
Turbidity	NTU	01/14/2019	N001	18.00	3.51			#	-	-
Uranium	mg/L	01/14/2019	0001	18.00	0.400		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0784 <well> Configuration 4

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/14/2019	0001	18.00	1.1		J	#	0.1	-
Oxidation Reduction Potential	mV	01/14/2019	N001	18.00	49			#	-	-
pH	s.u.	01/14/2019	N001	18.00	7.49			#	-	-
Specific Conductance	umhos/cm	01/14/2019	N001	18.00	1747			#	-	-
Temperature	C	01/14/2019	N001	18.00	12.17			#	-	-
Turbidity	NTU	01/14/2019	N001	18.00	2.78			#	-	-
Uranium	mg/L	01/14/2019	0001	18.00	0.018		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0785 <well> Configuration 4

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/14/2019	0001	18.00	17		J	#	1	-
Oxidation Reduction Potential	mV	01/14/2019	N001	18.00	16			#	-	-
pH	s.u.	01/14/2019	N001	18.00	7.51			#	-	-
Specific Conductance	umhos/cm	01/14/2019	N001	18.00	1951			#	-	-
Temperature	C	01/14/2019	N001	18.00	12.73			#	-	-
Turbidity	NTU	01/14/2019	N001	18.00	6.93			#	-	-
Uranium	mg/L	01/14/2019	0001	18.00	0.084		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0786 <well> Configuration 4

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/14/2019	0001	28.00	480		J	#	10	-
Ammonia Total as N	mg/L	01/14/2019	0002	20.49 - 30.26	450		J	#	10	-
Oxidation Reduction Potential	mV	01/14/2019	N001	28.00	101			#	-	-
pH	s.u.	01/14/2019	N001	28.00	6.85			#	-	-
Specific Conductance	umhos/cm	01/14/2019	N001	28.00	25622			#	-	-
Temperature	C	01/14/2019	N001	28.00	12.54			#	-	-
Turbidity	NTU	01/14/2019	N001	28.00	1.38			#	-	-
Uranium	mg/L	01/14/2019	0001	28.00	2.700		J	#	0.00012	-
Uranium	mg/L	01/14/2019	0002	20.49 - 30.26	2.700		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0787 <well> Configuration 4

REPORT DATE: 11/18/2019 4:10 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/14/2019	0001	36.00	2100		J	#	50	-
Oxidation Reduction Potential	mV	01/14/2019	N001	36.00	149			#	-	-
pH	s.u.	01/14/2019	N001	36.00	6.73			#	-	-
Specific Conductance	umhos/cm	01/14/2019	N001	36.00	87732			#	-	-
Temperature	C	01/14/2019	N001	36.00	12.14			#	-	-
Turbidity	NTU	01/14/2019	N001	36.00	1.58			#	-	-
Uranium	mg/L	01/14/2019	0001	36.00	1.900		J	#	0.00012	-

Appendix A. January 2019 CF4 Sampling Event (*continued*)

Water Quality Data

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

RECORDS: SELECTED FROM USEE105 WHERE RIN = '1901108' AND (DataValidationQualifiers IS NULL OR (DataValidationQualifiers NOT LIKE '%N%' AND DataValidationQualifiers NOT LIKE '%R%' AND DataValidationQualifiers NOT LIKE '%X%'))

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

LAB QUALIFERS:

*	Replicate analysis not within control limits.
+	Correlation coefficient for MSA < 0.995.
>	Result above upper detection limit.
A	TIC is a suspected aldol-condensation product.
B	Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: 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
M	GFAA duplicate injection precision not met.
N	Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
P	> 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
S	Result determined by method of standard addition (MSA).
U	Analytical result below detection limit.
W	Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
X	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Y	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
Z	Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFERS:

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.	N Presumptive evidence that analyte is present. The analyte is "tentatively identified".	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. January 2019 CF4 Sampling Event Sampling Event

Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE Moab

REPORT DATE: 4/9/2019

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date Time	Depth From Top of Casing (Ft)	Water Elevation (MSL)	Water Level Flag
0440		4070.71	1/15/2019	112.68	3958.03	
0780		3968.45	1/14/2019	16.4	3952.05	
0781		3968.56	1/14/2019	15.84	3952.72	
0782		3968.46	1/14/2019	16.36	3952.1	
0783		3966.16	1/14/2019	14.55	3951.61	
0784		3968.73	1/14/2019	17.1	3951.63	
0785		3969.24	1/14/2019	16.82	3952.42	
0786		3968.14	1/14/2019	15.37	3952.77	
0787		3968.43	1/14/2019	15.61	3952.82	

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

Trip Report

Date: April 11, 2019
To: Ken Pill
From: James Ritchey
Subject: January 2019 Sampling Event

Site: Moab
Date of Sampling Event: January 14 - 23, 2019
Team Members: J. Ritchey and A. McCarty
RIN Number Assigned: All samples were assigned to RIN 1901108.
Sample Shipment: One sample coolers was shipped overnight UPS to ALS Laboratory from Moab, Utah on January 24, 2019 (Tracking number 1Z5W1Y510195205009).

January 2019 Configuration 4 Sampling

Number of Locations Sampled: Eight observation wells (0780, 0781, 0782, 0783, 0784, 0785, 0786, and 0787) were sampled during the January 2019 Sampling Event.

Locations Not Sampled: None.

Field Variance: None.

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

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2000	0786	Duplicate from 28 ft bgs	Ground Water	JAN 008

Location Specific Information – Observation Wells: All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0780	01/14/2019	10:30	16.40	28
0781	01/14/2019	10:45	15.84	48
0782	01/14/2019	11:15	16.36	32
0783	01/14/2019	15:00	14.55	18
0784	01/14/2019	13:20	17.10	18
0785	01/14/2019	14:40	16.82	18
0786	01/14/2019	13:55	15.37	28
0787	01/14/2019	13:40	15.61	36

January 2019 Site Wide Sampling

Number of Locations Sampled: Four observation wells (0437, 0439, 0440, and 0453) were sampled during the January 2019 Sampling Event that were not sampled during the previous site wide sampling event (RIN 1811107). These locations were inaccessible due to strange, unidentifiable odors within the contaminated area.

Locations Not Sampled: None.

Field Variance: None.

Quality Control Sample Cross Reference: None

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

Well No.	Date	Time	Depth to Water (ft btoc)*	Sample Depth (ft bgs)
0437	01/23/2019	11:35	49.12	97**
0439	01/23/2019	10:50	55.18	118**
0440	01/15/2019	9:40	112.68	117
0453	01/15/2019	11:00	NA*	80

*Depths to water were not collected for wells in operation or where a water level could not be attained.
**Sample depths correspond with original sample depths prior to excavation of the tailings and are not true to the current modified ground surface.

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

Date	Daily Mean Flow (cfs)
01/14/2019	2,340
01/15/2019	2,380
01/16/2019	1,990
01/17/2019	1,890
01/18/2019	2,300
01/19/2019	2,650
01/20/2019	2,580
01/21/2019	2,510
01/22/2019	2,370
01/23/2019	2,350

Equipment Issues: None.

Corrective Action Required/Taken: None.

Appendix B.
March 2019 Crescent Junction Sampling Event

Water Sampling Field Activities Verification
Minimums and Maximums Report
Water Quality Data
Water Level Data
Trip Report

Appendix B. March 2019 Crescent Junction Sampling Event

Water Sampling Field Activities Verification

Sampling Event/RIN	March 2019 CJ Sampling Event/RIN 1903110	**Date(s) of Water Sampling**	March 19, 2019
Date(s) of Verification	July 18, 2019	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
1. Is the Sampling Analysis Plan (SAP) the primary document directing field procedures?	Yes	
2. List other documents, standard operating procedures, instructions.	NA	
3. Were the sampling locations specified in the planning documents sampled?	Yes	
4. Was a pre-trip calibration conducted as specified in the aforementioned documents?	Yes	
5. Was an operational check of the field equipment conducted in accordance with the SAP?	Yes	
6. Did the operational checks meet criteria?	Yes	
7. Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, oxidation reduction potential) of field measurements taken as specified?	Yes	Field measurements for temperature, pH, turbidity, oxidation reduction potential, and conductivity were collected.
8. Was the category of the well documented?	Yes	
9. 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?	NA	
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	
10. 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	
11. Were duplicates taken at a frequency of one per 20 samples?	NA	Only one sample was collected during this event.

Appendix B. March 2019 Crescent Junction Sampling Event (*continued*)

Water Sampling Field Activities Verification (*continued*)

Sampling Event/RIN	March 2019 CJ Sampling Event/RIN 1903110	**Date(s) of Water Sampling**	March 19, 2019
Date(s) of Verification	July 18, 2019	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
12. Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	The sample was collected using dedicated equipment.
13. Were trip blanks prepared and included with each shipment of volatile organic compound samples?	NA	
14. Were quality-control samples assigned a fictitious site identification number?	NA	
Was the true identity of the samples recorded on the quality assurance sample log?	NA	
15. Were samples collected in the containers specified?	Yes	
16. Were samples filtered and preserved as specified?	Yes	
17. Were the number and types of samples collected as specified?	NA	
18. Were COC records completed, and was sample custody maintained?	Yes	
19. Are field data sheets signed and dated by both team members?	Yes	
20. Was all other pertinent information documented on the field data sheets?	NA	
21. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
22. Were water levels measured at the locations specified in the planning documents?	Yes	

Appendix B. March 2019 Crescent Junction Sampling Event (*continued*)

Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 1903110
Comparison: All Historical Data
Report Date: 11/6/2019 9:07 AM

				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
CRJ01	0205	03/19/2019	Sodium	8500			14000			9600			14	0
CRJ01	0205	03/19/2019	Uranium-235	1.45	M3		0.81			0.32	M3		7	0

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

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. March 2019 Crescent Junction Sampling Event (*continued*)

Water Quality Data

General Water Quality Data by Location (USEE105) FOR SITE CRJ01, Crescent Junction Site
REPORT DATE: 4/5/2019
Location: 0205 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	03/19/2019	0001	68	-	13			#	1	
Arsenic	mg/L	03/19/2019	0001	68	-	0.039	U	J	#	0.039	
BICARBONATE AS CaCO3	mg/L	03/19/2019	0001	68	-	1100			#	20	
BORON	ug/L	03/19/2019	0001	68	-	1400		J	#	31	
Bromide	mg/L	03/19/2019	0001	68	-	20	UN		#	20	
Cadmium	mg/L	03/19/2019	0001	68	-	0.0033	U	J	#	0.0033	
Calcium	mg/L	03/19/2019	0001	68	-	330.000		J	#	0.12	
CARBONATE AS CaCO3	mg/L	03/19/2019	0001	68	-	20	U		#	20	
Chloride	mg/L	03/19/2019	0001	68	-	3500		J	#	100	
Chromium	mg/L	03/19/2019	0001	68	-	0.0051	U	J	#	0.0051	
Copper	mg/L	03/19/2019	0001	68	-	0.0097	U	J	#	0.0097	
Fluoride	mg/L	03/19/2019	0001	68	-	10	U		#	10	
Iron	mg/L	03/19/2019	0001	68	-	0.049	U	J	#	0.049	
Lead	mg/L	03/19/2019	0001	68	-	0.013	U	J	#	0.013	
Magnesium	mg/L	03/19/2019	0001	68	-	820.000		J	#	0.13	

Appendix B. October 2018 Crescent Junction Sampling Event (*continued*)
Water Quality Data (*continued*)

General Water Quality Data by Location (USEE105) FOR SITE CRJ01, Crescent Junction Site
REPORT DATE: 4/5/2019
Location: 0205 WELL

Parameter	Units	Sample Date	Sample ID	Depth Range (Ft BLS)		Result	Qualifiers Lab	Qualifiers Data	Qualifiers QA	Detection Limit	Uncertainty
Manganese	mg/L	03/19/2019	0001	68	-	0.360			#	0.0011	
MOLYBDENUM	ug/L	03/19/2019	0001	68	-	11	U	J	#	11	
Nitrate + Nitrite as Nitrogen	mg/L	03/19/2019	0001	68	-	960			#	5	
Oxidation Reduction Potential	mV	03/19/2019	N001	68	-	251			#	-	
pH	s.u.	03/19/2019	N001	68	-	6.92			#	-	
Potassium	mg/L	03/19/2019	0001	68	-	47.000		J	#	1.1	
Selenium	mg/L	03/19/2019	0001	68	-	3.100		J	#	0.027	
Sodium	mg/L	03/19/2019	0001	68	-	8500.000		J	#	3.3	
Specific Conductance	umhos /cm	03/19/2019	N001	68	-	37195			#	-	
Sulfate	mg/L	03/19/2019	0001	68	-	23000		J	#	500	
Temperature	C	03/19/2019	N001	68	-	14.13			#	-	
TOTAL ALKALINITY AS CaCO3	mg/L	03/19/2019	0001	68	-	1100			#	20	
Total Dissolved Solids	mg/L	03/19/2019	0001	68	-	39000			#	20	
Turbidity	NTU	03/19/2019	N001	68	-	5.43			#	-	
Uranium	mg/L	03/19/2019	0001	68	-	30.1	M3	J	#	0.5	± 6.00
Uranium-234	pCi/L	03/19/2019	0001	68	-	1.45	M3		#	0.23	± 0.75
Uranium-235	pCi/L	03/19/2019	0001	68	-	12.2	M3		#	0.4	± 2.80
Uranium-238	pCi/L	03/19/2019	0001	68	-	30.1	M3		#	0.5	± 6.00

Appendix B. October 2018 Crescent Junction Sampling Event (*continued*)
Water Quality Data (*continued*)

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

LAB QUALIFIERS:

*	Replicate analysis not within control limits.
>	Result above upper detection limit.
A	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.

Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE CJ

REPORT DATE: 4/9/2019

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date Time	Depth From Top of Casing (Ft)	Water Elevation (MSL)	Water Level Flag
0205	O	4949.0	03/19/2019	47.90	4901.1	

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

Moab TAC Team

Date: June 25, 2019
To: Ken Pill
From: James Ritchey
Subject: March 2019 CJ Sampling Event

Site: Crescent Junction – Well 0205
Date of Sampling Event: March 19, 2019
Team Members: K. Pill, and J. Ritchey
RIN Number Assigned: All samples were assigned to RIN 1903110.
Sample Shipment: The sample was shipped overnight UPS to ALS Laboratory from Moab, Utah on March 21, 2019 (Tracking number: 1Z5W1Y510195349088).

Crescent Junction Well 0205 Sampling

Number of Locations Sampled: One sample was collected from well 0205 during the March 2019 CJ sampling event.

Locations Not Sampled: None.

Field Variance: None.

Quality-control Sample Cross-reference: None.

Location-specific Information: Well 0205 was sampled using a dedicated submersible pump with dedicated tubing. The table below provides additional information:

Location	Date	Sample Depth (ft bgs)	Depth to Water (ft btoc)	Comments
0205	03/19/2019	68	47.90	Water has yellow color.

ft bgs = feet below ground surface

Well Inspection Summary: A well inspection was not conducted.

Regulatory: None.

Site Issues: None.

Corrective Action Required/Taken: None.

Appendix C.
April 2019 CF4/CF5 Sampling Event

Water Sampling Field Activities Verification
Minimums and Maximums Report
Water Quality Data
Trip Report

Appendix C. April 2019 CF4/CF5 Sampling Event

Water Sampling Field Activities Verification

Sampling Event/RIN	April 2019 CF4/CF5 Sampling Event /1904113	**Date(s) of Water Sampling**	April 25 – May 2, 2019
Date(s) of Verification	October 29, 2019	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
1. Is the Sampling Analysis Plan (SAP) the primary document directing field procedures?	Yes	
List other documents, standard operating procedures, instructions.	NA	
2. Were the sampling locations specified in the planning documents sampled?	Yes	
3. Was a pre-trip calibration conducted as specified in the aforementioned documents?	Yes	
4. Was an operational check of the field equipment conducted in accordance with the SAP?	Yes	An operational check was dated incorrectly (should have been dated 5/2/19, not 5/1/19)
Did the operational checks meet criteria?	Yes	
5. Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, oxidation reduction potential) of field measurements taken as specified?	Yes	Field measurements for temperature, pH, turbidity, oxidation reduction potential, and conductivity were collected.
6. Was the category of the well documented?	Yes	
7. Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged 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?	Yes	
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 milliliters per minute?	Yes	
Was one pump/tubing volume removed before sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	One duplicate sample was collected for 15 samples

Appendix C. April 2019 CF4/CF5 Sampling Event Sampling Event (*continued*)

Water Sampling Field Activities Verification (*continued*)

Sampling Event/RIN	April 2019 CF4/CF5 Sampling Event /1904113	**Date(s) of Water Sampling**	April 25 – May 2, 2019
Date(s) of Verification	October 29, 2019	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
10. Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	NA	All samples were collected using dedicated equipment.
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	Duplicate for 0785 given location 2000
13. Was the true identity of the samples recorded on the quality assurance sample log?	Yes	
14. Were samples collected in the containers specified?	Yes	
15. Were samples filtered and preserved as specified?	Yes	
16. Were the number and types of samples collected as specified?	Yes	
17. Were COC records completed, and was sample custody maintained?	Yes	
18. Are field data sheets signed and dated by both team members?	Yes	
19. Was all other pertinent information documented on the field data sheets?	Yes	
20. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
21. Were water levels measured at the locations specified in the planning documents?	Yes	

Appendix C. April 2019 CF4/CF5 Sampling Event (*continued*)

Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 1904113
Comparison: All Historical Data
Report Date: 11/6/2019 9:07 AM

				Current			Historical Maximum			Historical Minimum			Count	
					Qualifiers			Qualifiers			Qualifiers			
Site Code	Location Code	Sample Date	Analyte	Result	Lab	Data	Result	Lab	Data	Result	Lab	Data	N	N Below Detect
MOA01	0810	04/30/2019	Ammonia Total as N	260			450		J	270			24	0
MOA01	0814	05/02/2019	Ammonia Total as N	140			900		J	150			26	0

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

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 C. April 2019 CF4/CF5 Sampling Event (*continued*)

Water Quality Data

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0780 <well> Configuration 4

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/25/2019	0001	28.00	1.4		J	#	0.1	-
Oxidation Reduction Potential	mV	04/25/2019	N001	28.00	93			#	-	-
pH	s.u.	04/25/2019	N001	28.00	7.32			#	-	-
Specific Conductance	umhos/cm	04/25/2019	N001	28.00	1334			#	-	-
Temperature	C	04/25/2019	N001	28.00	13.47			#	-	-
Turbidity	NTU	04/25/2019	N001	28.00	2.28			#	-	-
Uranium	mg/L	04/25/2019	0001	28.00	0.024		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0781 <well> Configuration 4

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/25/2019	0001	48.00	1400		J	#	50	-
Oxidation Reduction Potential	mV	04/25/2019	N001	48.00	120			#	-	-
pH	s.u.	04/25/2019	N001	48.00	6.70			#	-	-
Specific Conductance	umhos/cm	04/25/2019	N001	48.00	62038			#	-	-
Temperature	C	04/25/2019	N001	48.00	15.80			#	-	-
Turbidity	NTU	04/25/2019	N001	48.00	2.27			#	-	-
Uranium	mg/L	04/25/2019	0001	48.00	2.800		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0782 <well> Configuration 4

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/25/2019	0001	33.00	180		J	#	10	-
Oxidation Reduction Potential	mV	04/25/2019	N001	33.00	32			#	-	-
pH	s.u.	04/25/2019	N001	33.00	7.35			#	-	-
Specific Conductance	umhos/cm	04/25/2019	N001	33.00	7234			#	-	-
Temperature	C	04/25/2019	N001	33.00	14.20			#	-	-
Turbidity	NTU	04/25/2019	N001	33.00	0.97			#	-	-
Uranium	mg/L	04/25/2019	0001	33.00	0.630		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0783 <well> Configuration 4

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/25/2019	0001	18.00	15		J	#	1	-
Oxidation Reduction Potential	mV	04/25/2019	N001	18.00	36			#	-	-
pH	s.u.	04/25/2019	N001	18.00	7.60			#	-	-
Specific Conductance	umhos/cm	04/25/2019	N001	18.00	1415			#	-	-
Temperature	C	04/25/2019	N001	18.00	13.02			#	-	-
Turbidity	NTU	04/25/2019	N001	18.00	2.09			#	-	-
Uranium	mg/L	04/25/2019	0001	18.00	0.082		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0784 <well> Configuration 4

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/29/2019	0001	18.00	1.7		J	#	0.1	-
Oxidation Reduction Potential	mV	04/29/2019	N001	18.00	-180			#	-	-
pH	s.u.	04/29/2019	N001	18.00	7.30			#	-	-
Specific Conductance	umhos/cm	04/29/2019	N001	18.00	2493			#	-	-
Temperature	C	04/29/2019	N001	18.00	12.60			#	-	-
Turbidity	NTU	04/29/2019	N001	18.00	1.77			#	-	-
Uranium	mg/L	04/29/2019	0001	18.00	0.066		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0785 <well> Configuration 4

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/29/2019	0001	18.00	7		J	#	1	-
Ammonia Total as N	mg/L	04/29/2019	0002	9.60 - 19.60	5.4		J	#	1	-
Oxidation Reduction Potential	mV	04/29/2019	N001	18.00	106			#	-	-
pH	s.u.	04/29/2019	N001	18.00	7.40			#	-	-
Specific Conductance	umhos/cm	04/29/2019	N001	18.00	1687			#	-	-
Temperature	C	04/29/2019	N001	18.00	11.80			#	-	-
Turbidity	NTU	04/29/2019	N001	18.00	2.95		J	#	-	-
Uranium	mg/L	04/29/2019	0001	18.00	0.070		J	#	1.2E-05	-
Uranium	mg/L	04/29/2019	0002	9.60 - 19.60	0.073		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0786 <well> Configuration 4

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/29/2019	0001	28.00	11		J	#	1	-
Oxidation Reduction Potential	mV	04/29/2019	N001	28.00	40			#	-	-
pH	s.u.	04/29/2019	N001	28.00	7.60			#	-	-
Specific Conductance	umhos/cm	04/29/2019	N001	28.00	1712			#	-	-
Temperature	C	04/29/2019	N001	28.00	11.70			#	-	-
Turbidity	NTU	04/29/2019	N001	28.00	0.90			#	-	-
Uranium	mg/L	04/29/2019	0001	28.00	0.072		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0787 <well> Configuration 4

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/29/2019	0001	36.00	450		J	#	10	-
Oxidation Reduction Potential	mV	04/29/2019	N001	36.00	68			#	-	-
pH	s.u.	04/29/2019	N001	36.00	7.02			#	-	-
Specific Conductance	umhos/cm	04/29/2019	N001	36.00	26380			#	-	-
Temperature	C	04/29/2019	N001	36.00	13.20			#	-	-
Turbidity	NTU	04/29/2019	N001	36.00	1.98			#	-	-
Uranium	mg/L	04/29/2019	0001	36.00	1.600		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0810 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/30/2019	0001	10.40 - 40.40	260		J	#	10	-
Oxidation Reduction Potential	mV	04/30/2019	N001	10.40 - 40.40	161			#	-	-
pH	s.u.	04/30/2019	N001	10.40 - 40.40	6.75			#	-	-
Specific Conductance	umhos/cm	04/30/2019	N001	10.40 - 40.40	30939			#	-	-
Temperature	C	04/30/2019	N001	10.40 - 40.40	17.33			#	-	-
Turbidity	NTU	04/30/2019	N001	10.40 - 40.40	24.20			#	-	-
Uranium	mg/L	04/30/2019	0001	10.40 - 40.40	2.900		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0811 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/30/2019	0001	8.60 - 38.60	360		J	#	10	-
Oxidation Reduction Potential	mV	04/30/2019	N001	8.60 - 38.60	182			#	-	-
pH	s.u.	04/30/2019	N001	8.60 - 38.60	6.87			#	-	-
Specific Conductance	umhos/cm	04/30/2019	N001	8.60 - 38.60	21427			#	-	-
Temperature	C	04/30/2019	N001	8.60 - 38.60	16.65			#	-	-
Turbidity	NTU	04/30/2019	N001	8.60 - 38.60	2.68			#	-	-
Uranium	mg/L	04/30/2019	0001	8.60 - 38.60	3.100		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0812 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/30/2019	0001	14.20 - 44.20	460		J	#	10	-
Oxidation Reduction Potential	mV	04/30/2019	N001	14.20 - 44.20	184			#	-	-
pH	s.u.	04/30/2019	N001	14.20 - 44.20	6.92			#	-	-
Specific Conductance	umhos/cm	04/30/2019	N001	14.20 - 44.20	18970			#	-	-
Temperature	C	04/30/2019	N001	14.20 - 44.20	15.15			#	-	-
Turbidity	NTU	04/30/2019	N001	14.20 - 44.20	2.31			#	-	-
Uranium	mg/L	04/30/2019	0001	14.20 - 44.20	2.100		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0813 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/02/2019	0001	14.40 - 44.40	410		J	#	10	-
Oxidation Reduction Potential	mV	05/02/2019	N001	14.40 - 44.40	251			#	-	-
pH	s.u.	05/02/2019	N001	14.40 - 44.40	6.74			#	-	-
Specific Conductance	umhos/cm	05/02/2019	N001	14.40 - 44.40	15525			#	-	-
Temperature	C	05/02/2019	N001	14.40 - 44.40	14.11			#	-	-
Turbidity	NTU	05/02/2019	N001	14.40 - 44.40	3.61			#	-	-
Uranium	mg/L	05/02/2019	0001	14.40 - 44.40	1.700		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0814 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/02/2019	0001	12.40 - 42.40	140		J	#	10	-
Oxidation Reduction Potential	mV	05/02/2019	N001	12.40 - 42.40	204			#	-	-
pH	s.u.	05/02/2019	N001	12.40 - 42.40	6.89			#	-	-
Specific Conductance	umhos/cm	05/02/2019	N001	12.40 - 42.40	26508			#	-	-
Temperature	C	05/02/2019	N001	12.40 - 42.40	18.00			#	-	-
Turbidity	NTU	05/02/2019	N001	12.40 - 42.40	2.89			#	-	-
Uranium	mg/L	05/02/2019	0001	12.40 - 42.40	3.000		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0815 <well, extraction well> Configuration 5

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/02/2019	0001	21.70 - 51.70	120		J	#	10	-
Oxidation Reduction Potential	mV	05/02/2019	N001	21.70 - 51.70	212			#	-	-
pH	s.u.	05/02/2019	N001	21.70 - 51.70	6.93			#	-	-
Specific Conductance	umhos/cm	05/02/2019	N001	21.70 - 51.70	22224			#	-	-
Temperature	C	05/02/2019	N001	21.70 - 51.70	17.02			#	-	-
Turbidity	NTU	05/02/2019	N001	21.70 - 51.70	4.79			#	-	-
Uranium	mg/L	05/02/2019	0001	21.70 - 51.70	3.300		J	#	0.00012	-

Appendix C. April 2019 CF4/CF5 Sampling Event (*continued*)

Water Quality Data (*continued*)

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PW02 <well>

REPORT DATE: 11/19/2019 12:19 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	04/30/2019	0001	20.04 - 60.04	410		J	#	10	-
Oxidation Reduction Potential	mV	04/30/2019	N001	20.04 - 60.04	205			#	-	-
pH	s.u.	04/30/2019	N001	20.04 - 60.04	6.85			#	-	-
Specific Conductance	umhos/cm	04/30/2019	N001	20.04 - 60.04	30870			#	-	-
Temperature	C	04/30/2019	N001	20.04 - 60.04	16.48			#	-	-
Turbidity	NTU	04/30/2019	N001	20.04 - 60.04	1.67			#	-	-
Uranium	mg/L	04/30/2019	0001	20.04 - 60.04	3.300		J	#	0.00012	-

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

RECORDS: SELECTED FROM USEE105 WHERE RIN = '1901108' AND (DataValidationQualifiers IS NULL OR (DataValidationQualifiers NOT LIKE '%N%' AND DataValidationQualifiers NOT LIKE '%R%' AND DataValidationQualifiers NOT LIKE '%X%'))

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

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

LAB QUALIFERS:

- * Replicate analysis not within control limits.
- \+ Correlation coefficient for MSA < 0.995.
- \> Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: 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

M GFAA duplicate injection precision not met.

N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).

P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.

S Result determined by method of standard addition (MSA).

U Analytical result below detection limit.

W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.

X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFERS:

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.

N Presumptive evidence that analyte is present. The analyte is "tentatively identified".

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 C. April 2019 CF4/CF5 Sampling Event (*continued*)

Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE Moab

REPORT DATE: 10/29/2019

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date Time	Depth From Top of Casing (Ft)	Water Elevation (MSL)	Water Level Flag
0780		3968.45	4/25/2019	13.92	3954.53	
0781		3968.56	4/25/2019	13.88	3954.68	
0782		3968.46	4/25/2019	13.95	3954.51	
0783		3966.16	4/25/2019	12.12	3954.04	
0784		3968.73	4/29/2019	12.98	3955.75	
0785		3969.24	4/29/2019	12.81	3956.43	
0786		3968.14	4/29/2019	12.43	3955.71	
0787		3968.43	4/29/2019	12.89	3955.54	
0810		3961.88	4/30/2019	6.83	3955.05	
0811		3962.82	4/30/2019	7.68	3955.14	
0812		3963.12	4/30/2019	6.00	3957.12	
0813		3964.45	5/2/2019	8.00	3956.45	
0815		3963.14	5/2/2019	7.81	3955.33	
SMI-PW02		3966.73	4/30/2019	11.38	3955.35	

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

Trip Report

Date: October 10, 2019
To: Ken Pill
From: James Ritchey
Subject: April 2019 CF4/CF5 Sampling Event

Site: Moab
Date of Sampling Event: April 25 – May 2, 2019
Team Members: J. Ritchey N. Andrews
RIN Number Assigned: All samples were assigned to RIN 1904113.
Sample Shipment: One sample coolers was shipped overnight UPS to ALS Laboratory from Moab, Utah on May 2, 2019 (Tracking number 1Z5W1Y510191470819).

April 2019 Configuration 4 Sampling

Number of Locations Sampled: Eight observation wells (0780, 0781, 0782, 0783, 0784, 0785, 0786, and 0787) were sampled during the April 2019 Sampling Event.

Locations Not Sampled: None.

Field Variance: None.

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

False ID	True ID	Sample Type	Associated Matrix	Ticket Number
2000	0785	Duplicate from 18 ft bgs	Ground Water	APR 009

Location Specific Information – Observation Wells: All observation wells were sampled using micro-purge techniques with a peristaltic pump and dedicated pump-head and downhole tubing. Sample depths and water levels for each observation well are listed below.

Well No.	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
0780	4/25/2019	14:00	13.92	28
0781	4/25/2019	14:25	13.88	46
0782	4/25/2019	14:45	13.95	32
0783	4/25/2019	15:20	12.12	18
0784	4/29/2019	14:40	12.98	18
0785	4/29/2019	16:05	12.81	18
0786	4/29/2019	15:20	12.43	28
0787	4/29/2019	15:05	12.89	36

April 2018 Configuration 5 Sampling

Number of Locations Sampled: Seven extraction wells (0810, 0811, 0812, 0813, 0814, 0815, and SMI-PW02) and one duplicate were sampled during the April 2019 Monthly Sampling Event.

Locations Not Sampled: Well 0816 was not sampled because the submersible pump had an inoperable motor.

Field Variance: Due to the submersible pump running periodically, a depth to water was not collected for well 0814.

Quality Control Sample Cross Reference: None.

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

Well No.	Date	Time	Depth to Water (ft btoc)*	Pump Intake Depth (ft bgs)
0810	4/30/2019	14:40	6.83	10.4 – 40.4
0811	4/30/2019	14:55	7.68	8.6 – 38.6
0812	4/30/2019	15:25	6.0	14.2 – 44.2
0813	5/2/2019	9:40	8.00	14.4 – 44.4
0814	5/2/2019	10:15	NA*	12.4 – 42.4
0815	5/2/2019	10:00	7.81	21.7 – 51.7
SMI-PW02	4/30/2019	15:10	11.38	20.0 – 60.0

*Depths to water were not collected for wells in operation or where a water level could not be attained.

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

Date	Daily Mean Flow (cfs)
04/25/2019	11,000
04/26/2019	11,200
04/27/2019	12,600
04/28/2019	14,700
04/29/2019	16,100
04/30/2019	17,300
05/01/2019	21,600
05/02/2019	20,100
04/25/2019	11,000

Equipment Issues: None.

Corrective Action Required/Taken: None.

Appendix D.
May/June 2019 Site-wide Sampling Event

Water Sampling Field Activities Verification
Minimums and Maximums Report
Blanks Report
Water Quality Data
Water Level Data
Trip Report

Appendix D. May/June 2019 Site-wide Sampling Event

Water Sampling Field Activities Verification

Sampling Event/RIN	May/June 2019 Site-wide Sampling Event/1905114	**Date(s) of Water Sampling**	May 6 – June 13, 2019
Date(s) of Verification	October 29, 2019	**Name of Verifier**	Ken Pill

		Response (Yes, No, NA)	Comments
1.	Is the Sampling Analysis Plan (SAP) the primary document directing field procedures?	Yes	
	List other documents, standard operating procedures, instructions.	NA	
2.	Were the sampling locations specified in the planning documents sampled?	Yes	
3.	Was a pre-trip calibration conducted as specified in the aforementioned documents?	Yes	
4.	Was an operational check of the field equipment conducted in accordance with the SAP?	Yes	
	Did the operational checks meet criteria?	Yes	
5.	Were the number and types (alkalinity, temperature, electrical conductivity, pH, turbidity, oxidation reduction potential) of field measurements taken as specified?	Yes	Field measurements for temperature, pH, turbidity, oxidation reduction potential, and conductivity were collected.
6.	Was the category of the well documented?	No	No category provided for the samples from well 0437, 0401, 0456, 0455
7.	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?	Yes	
8.	Were the following conditions met when purging a Category II well:		
	Was the flow rate less than 500 milliliters per minute?	Yes	
	Was one pump/tubing volume removed before sampling?	NA	
9.	Were duplicates taken at a frequency of one per 20 samples?	NA	Three duplicates were collected for 60 samples.

Appendix D. May/June 2019 Site-wide Sampling Event (*continued*)

Water Sampling Field Activities Verification (*continued*)

Sampling Event/RIN	May/June 2019 Site-wide Sampling Event/1905114	**Date(s) of Water Sampling**	May 6 – June 13, 2019
Date(s) of Verification	October 29, 2019	**Name of Verifier**	Ken Pill

	Response (Yes, No, NA)	Comments
10. Were EBs taken at a frequency of one per 20 samples that were collected with non-dedicated equipment?	Yes	One blank was collected for the 8 surface water samples, all other samples were collected using dedicated equipment.
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	Duplicate samples were collected from locations 0492 (2001), AMM-2 (2000), and 0435 (2003)
Was the true identity of the samples recorded on the quality assurance sample log?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were COC records completed, and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	No	It was not documented on the SW CR3, 0201, 0411 field data sheets, ice present at locations before or after
20. Were water levels measured at the locations specified in the planning documents?	Yes	Water levels were measured between May 13 and 14, plus just prior to sample collection

Appendix D. May/June 2019 Site-wide Sampling Event (*continued*)

Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 1905114
Comparison: All Historical Data
Report Date: 11/6/2019 9:06 AM

				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	0411	06/12/2019	Uranium	0.57			19			0.91			14	0
MOA01	0413	05/07/2019	Uranium	4.2			3.8			1.1			23	0
MOA01	0434	06/11/2019	Ammonia Total as N	1.1			0.3		J	0.0854		FJ	16	3
MOA01	0435	06/13/2019	Ammonia Total as N	3.4			3.02		F	1.3			16	0
MOA01	0435	06/13/2019	Ammonia Total as N	3.8			3.02		F	1.3			16	0
MOA01	0453	05/21/2019	Ammonia Total as N	110			510		J	160			16	0
MOA01	0453	05/21/2019	Uranium	0.66			2.7			0.7			19	0
MOA01	TP-01	05/06/2019	Uranium	0.04			0.41			0.042			33	0
MOA01	UPD-21	06/13/2019	Ammonia Total as N	1.4			74			2			14	0
MOA01	UPD-23	05/16/2019	Ammonia Total as N	0.69			7.3			1.4			12	0

Appendix D. May/June 2019 Site-wide Sampling Event (*continued*)

Minimums and Maximums Report (*continued*)

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

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

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 D. May/June 2019 Site-wide Sampling Event (*continued*)

Blanks Report

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	05/30/2019	0001	mg/L	0.1	U		0.1		E
Uranium	MOA01	0999	05/30/2019	0001	mg/L	0.000012	J		1.2E-05		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.

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0201 <surface location, river>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/30/2019	0001	0.00 - 0.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/30/2019	N001	0.00 - 0.00	78			#	-	-
pH	s.u.	05/30/2019	N001	0.00 - 0.00	7.97			#	-	-
Specific Conductance	umhos/cm	05/30/2019	N001	0.00 - 0.00	619			#	-	-
Temperature	C	05/30/2019	N001	0.00 - 0.00	14.74			#	-	-
Turbidity	NTU	05/30/2019	N001	0.00 - 0.00	999.00			#	-	-
Uranium	mg/L	05/30/2019	0001	0.00 - 0.00	0.0021		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0218 <surface location, river>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/28/2019	0001	0.00 - 0.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/28/2019	N001	0.00 - 0.00	247			#	-	-
pH	s.u.	05/28/2019	N001	0.00 - 0.00	8.05			#	-	-
Specific Conductance	umhos/cm	05/28/2019	N001	0.00 - 0.00	683			#	-	-
Temperature	C	05/28/2019	N001	0.00 - 0.00	14.48			#	-	-
Turbidity	NTU	05/28/2019	N001	0.00 - 0.00	265.00			#	-	-
Uranium	mg/L	05/28/2019	0001	0.00 - 0.00	0.0021		J	#	1.2E-05	-

Appendix D. May/June 2019 Site-wide Sampling Event (*continued*)

Water Quality Data (*continued*)

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0226 <surface location, river>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/29/2019	0001	0.00 - 0.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/29/2019	N001	0.00 - 0.00	91			#	-	-
pH	s.u.	05/29/2019	N001	0.00 - 0.00	8.48			#	-	-
Specific Conductance	umhos/cm	05/29/2019	N001	0.00 - 0.00	565			#	-	-
Temperature	C	05/29/2019	N001	0.00 - 0.00	14.18			#	-	-
Turbidity	NTU	05/29/2019	N001	0.00 - 0.00	274.00			#	-	-
Uranium	mg/L	05/29/2019	0001	0.00 - 0.00	0.0021		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0274 <surface location, river> Configuration 4

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/29/2019	0001	0.00 - 0.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/29/2019	N001	0.00 - 0.00	237			#	-	-
pH	s.u.	05/29/2019	N001	0.00 - 0.00	7.62			#	-	-
Specific Conductance	umhos/cm	05/29/2019	N001	0.00 - 0.00	600			#	-	-
Temperature	C	05/29/2019	N001	0.00 - 0.00	13.86			#	-	-
Turbidity	NTU	05/29/2019	N001	0.00 - 0.00	199.00			#	-	-
Uranium	mg/L	05/29/2019	0001	0.00 - 0.00	0.0021		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0401 <well> Configuration 2

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/06/2019	0001	18.00	380	N	J	#	10	-
Oxidation Reduction Potential	mV	06/06/2019	N001	18.00	33			#	-	-
pH	s.u.	06/06/2019	N001	18.00	6.66			#	-	-
Specific Conductance	umhos/cm	06/06/2019	N001	18.00	15890			#	-	-
Temperature	C	06/06/2019	N001	18.00	16.37			#	-	-
Turbidity	NTU	06/06/2019	N001	18.00	1.53			#	-	-
Uranium	mg/L	06/06/2019	0001	18.00	1.800		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0403 <well> Configuration 1

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/06/2019	0001	18.00	100		J	#	5	-
Oxidation Reduction Potential	mV	06/06/2019	N001	18.00	24			#	-	-
pH	s.u.	06/06/2019	N001	18.00	7.00			#	-	-
Specific Conductance	umhos/cm	06/06/2019	N001	18.00	7372			#	-	-
Temperature	C	06/06/2019	N001	18.00	15.19			#	-	-
Turbidity	NTU	06/06/2019	N001	18.00	2.43			#	-	-
Uranium	mg/L	06/06/2019	0001	18.00	0.720		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0404 <well> Configuration 3

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/06/2019	0001	18.00	470		J	#	10	-
Oxidation Reduction Potential	mV	06/06/2019	N001	18.00	48			#	-	-
pH	s.u.	06/06/2019	N001	18.00	6.69			#	-	-
Specific Conductance	umhos/cm	06/06/2019	N001	18.00	14352			#	-	-
Temperature	C	06/06/2019	N001	18.00	16.55			#	-	-
Turbidity	NTU	06/06/2019	N001	18.00	1.52			#	-	-
Uranium	mg/L	06/06/2019	0001	18.00	1.600		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0406 <well> Baseline Area

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/16/2019	0001	18.00	150		J	#	10	-
Oxidation Reduction Potential	mV	05/16/2019	N001	18.00	118			#	-	-
pH	s.u.	05/16/2019	N001	18.00	7.04			#	-	-
Specific Conductance	umhos/cm	05/16/2019	N001	18.00	8808			#	-	-
Temperature	C	05/16/2019	N001	18.00	14.38			#	-	-
Turbidity	NTU	05/16/2019	N001	18.00	3.61			#	-	-
Uranium	mg/L	05/16/2019	0001	18.00	1.000		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0407 <well> Configuration 1

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/06/2019	0001	18.00	40		J	#	1	-
Oxidation Reduction Potential	mV	06/06/2019	N001	18.00	-10			#	-	-
pH	s.u.	06/06/2019	N001	18.00	6.81			#	-	-
Specific Conductance	umhos/cm	06/06/2019	N001	18.00	7155			#	-	-
Temperature	C	06/06/2019	N001	18.00	16.26			#	-	-
Turbidity	NTU	06/06/2019	N001	18.00	4.11			#	-	-
Uranium	mg/L	06/06/2019	0001	18.00	0.980		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0410 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/12/2019	0001	23.50	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	06/12/2019	N001	23.50	56			#	-	-
pH	s.u.	06/12/2019	N001	23.50	7.01			#	-	-
Specific Conductance	umhos/cm	06/12/2019	N001	23.50	3282			#	-	-
Temperature	C	06/12/2019	N001	23.50	19.51			#	-	-
Turbidity	NTU	06/12/2019	N001	23.50	8.84			#	-	-
Uranium	mg/L	06/12/2019	0001	23.50	0.420		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0411 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/12/2019	0001	8.00	7		J	#	1	-
Oxidation Reduction Potential	mV	06/12/2019	N001	8.00	11			#	-	-
pH	s.u.	06/12/2019	N001	8.00	7.40			#	-	-
Specific Conductance	umhos/cm	06/12/2019	N001	8.00	7884			#	-	-
Temperature	C	06/12/2019	N001	8.00	20.38			#	-	-
Turbidity	NTU	06/12/2019	N001	8.00	23.90			#	-	-
Uranium	mg/L	06/12/2019	0001	8.00	0.570		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0412 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/06/2019	0001	9.50	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/06/2019	N001	9.50	63			#	-	-
pH	s.u.	05/06/2019	N001	9.50	7.62			#	-	-
Specific Conductance	umhos/cm	05/06/2019	N001	9.50	1905			#	-	-
Temperature	C	05/06/2019	N001	9.50	14.92			#	-	-
Turbidity	NTU	05/06/2019	N001	9.50	28.90			#	-	-
Uranium	mg/L	05/06/2019	0001	9.50	3.000		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0413 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/07/2019	0001	10.50	55		J	#	2	-
Oxidation Reduction Potential	mV	05/07/2019	N001	10.50	199			#	-	-
pH	s.u.	05/07/2019	N001	10.50	7.79			#	-	-
Specific Conductance	umhos/cm	05/07/2019	N001	10.50	7208			#	-	-
Temperature	C	05/07/2019	N001	10.50	13.79			#	-	-
Turbidity	NTU	05/07/2019	N001	10.50	3.94			#	-	-
Uranium	mg/L	05/07/2019	0001	10.50	4.200		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0414 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/07/2019	0001	7.50	26		J	#	1	-
Oxidation Reduction Potential	mV	05/07/2019	N001	7.50	43			#	-	-
pH	s.u.	05/07/2019	N001	7.50	7.14			#	-	-
Specific Conductance	umhos/cm	05/07/2019	N001	7.50	9765			#	-	-
Temperature	C	05/07/2019	N001	7.50	13.04			#	-	-
Turbidity	NTU	05/07/2019	N001	7.50	62.50			#	-	-
Uranium	mg/L	05/07/2019	0001	7.50	2.900		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0430 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2019	0001	101.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	06/11/2019	N001	101.00	23			#	-	-
pH	s.u.	06/11/2019	N001	101.00	7.22			#	-	-
Specific Conductance	umhos/cm	06/11/2019	N001	101.00	6169			#	-	-
Temperature	C	06/11/2019	N001	101.00	19.13			#	-	-
Turbidity	NTU	06/11/2019	N001	101.00	2.05			#	-	-
Uranium	mg/L	06/11/2019	0001	101.00	0.012		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0432 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2019	0001	55.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	06/11/2019	N001	55.00	65			#	-	-
pH	s.u.	06/11/2019	N001	55.00	7.47			#	-	-
Specific Conductance	umhos/cm	06/11/2019	N001	55.00	3245			#	-	-
Temperature	C	06/11/2019	N001	55.00	19.57			#	-	-
Turbidity	NTU	06/11/2019	N001	55.00	7.96			#	-	-
Uranium	mg/L	06/11/2019	0001	55.00	0.0019		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0433 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2019	0001	99.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	06/11/2019	N001	99.00	-28			#	-	-
pH	s.u.	06/11/2019	N001	99.00	7.37			#	-	-
Specific Conductance	umhos/cm	06/11/2019	N001	99.00	4476			#	-	-
Temperature	C	06/11/2019	N001	99.00	20.04			#	-	-
Turbidity	NTU	06/11/2019	N001	99.00	3.22			#	-	-
Uranium	mg/L	06/11/2019	0001	99.00	0.0019		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0434 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2019	0001	35.00	1.1		J	#	1	-
Oxidation Reduction Potential	mV	06/11/2019	N001	35.00	-54			#	-	-
pH	s.u.	06/11/2019	N001	35.00	6.91			#	-	-
Specific Conductance	umhos/cm	06/11/2019	N001	35.00	43309			#	-	-
Temperature	C	06/11/2019	N001	35.00	19.43			#	-	-
Turbidity	NTU	06/11/2019	N001	35.00	1.39			#	-	-
Uranium	mg/L	06/11/2019	0001	35.00	0.023		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0435 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/13/2019	0001	173.00	3.4		J	#	1	-
Ammonia Total as N	mg/L	06/13/2019	0002	171.00 - 181.00	3.8		J	#	1	-
Oxidation Reduction Potential	mV	06/13/2019	N001	173.00	-168			#	-	-
pH	s.u.	06/13/2019	N001	173.00	6.89			#	-	-
Specific Conductance	umhos/cm	06/13/2019	N001	173.00	105777			#	-	-
Temperature	C	06/13/2019	N001	173.00	18.71			#	-	-
Turbidity	NTU	06/13/2019	N001	173.00	2.01			#	-	-
Uranium	mg/L	06/13/2019	0001	173.00	0.026		J	#	1.2E-05	-
Uranium	mg/L	06/13/2019	0002	171.00 - 181.00	0.026		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0437 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/30/2019	0001	90.00 - 100.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/30/2019	N001	90.00 - 100.00	200			#	-	-
pH	s.u.	05/30/2019	N001	90.00 - 100.00	7.32			#	-	-
Specific Conductance	umhos/cm	05/30/2019	N001	90.00 - 100.00	9534			#	-	-
Temperature	C	05/30/2019	N001	90.00 - 100.00	17.38			#	-	-
Turbidity	NTU	05/30/2019	N001	90.00 - 100.00	1.79			#	-	-
Uranium	mg/L	05/30/2019	0001	90.00 - 100.00	2.300		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0439 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/21/2019	0001	118.00	2.4		J	#	0.1	-
Oxidation Reduction Potential	mV	05/21/2019	N001	118.00	154			#	-	-
pH	s.u.	05/21/2019	N001	118.00	6.76			#	-	-
Specific Conductance	umhos/cm	05/21/2019	N001	118.00	10438			#	-	-
Temperature	C	05/21/2019	N001	118.00	17.43			#	-	-
Turbidity	NTU	05/21/2019	N001	118.00	24.00			#	-	-
Uranium	mg/L	05/21/2019	0001	118.00	1.400		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0440 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/21/2019	0001	117.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/21/2019	N001	117.00	111			#	-	-
pH	s.u.	05/21/2019	N001	117.00	6.79			#	-	-
Specific Conductance	umhos/cm	05/21/2019	N001	117.00	8461			#	-	-
Temperature	C	05/21/2019	N001	117.00	17.63			#	-	-
Turbidity	NTU	05/21/2019	N001	117.00	11.30			#	-	-
Uranium	mg/L	05/21/2019	0001	117.00	0.031		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0441 <well> Queue/Support Area

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2019	0001	53.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	06/11/2019	N001	53.00	-78			#	-	-
pH	s.u.	06/11/2019	N001	53.00	7.06			#	-	-
Specific Conductance	umhos/cm	06/11/2019	N001	53.00	10491			#	-	-
Temperature	C	06/11/2019	N001	53.00	20.45			#	-	-
Turbidity	NTU	06/11/2019	N001	53.00	3.69			#	-	-
Uranium	mg/L	06/11/2019	0001	53.00	0.039		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0443 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/12/2019	0001	73.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	06/12/2019	N001	73.00	-6			#	-	-
pH	s.u.	06/12/2019	N001	73.00	7315.00			#	-	-
Specific Conductance	umhos/cm	06/12/2019	N001	73.00	6121			#	-	-
Temperature	C	06/12/2019	N001	73.00	19.57			#	-	-
Turbidity	NTU	06/12/2019	N001	73.00	4.08			#	-	-
Uranium	mg/L	06/12/2019	0001	73.00	0.011		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0453 <well> Contaminated Area

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/21/2019	0001	80.00	110		J	#	5	-
Oxidation Reduction Potential	mV	05/21/2019	N001	80.00	152			#	-	-
pH	s.u.	05/21/2019	N001	80.00	6.95			#	-	-
Specific Conductance	umhos/cm	05/21/2019	N001	80.00	35502			#	-	-
Temperature	C	05/21/2019	N001	80.00	16.60			#	-	-
Turbidity	NTU	05/21/2019	N001	80.00	2.31			#	-	-
Uranium	mg/L	05/21/2019	0001	80.00	0.660		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0454 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/07/2019	0001	13.00	55		J	#	10	-
Oxidation Reduction Potential	mV	05/07/2019	N001	13.00	-313			#	-	-
pH	s.u.	05/07/2019	N001	13.00	6.68			#	-	-
Specific Conductance	umhos/cm	05/07/2019	N001	13.00	90790			#	-	-
Temperature	C	05/07/2019	N001	13.00	19.33			#	-	-
Turbidity	NTU	05/07/2019	N001	13.00	9.84			#	-	-
Uranium	mg/L	05/07/2019	0001	13.00	0.960		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0455 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2019	0001	46.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	06/11/2019	N001	46.00	-48			#	-	-
pH	s.u.	06/11/2019	N001	46.00	7.47			#	-	-
Specific Conductance	umhos/cm	06/11/2019	N001	46.00	2889			#	-	-
Temperature	C	06/11/2019	N001	46.00	19.89			#	-	-
Turbidity	NTU	06/11/2019	N001	46.00	999.00			#	-	-
Uranium	mg/L	06/11/2019	0001	46.00	0.0019		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0456 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/11/2019	0001	53.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	06/11/2019	N001	53.00	74			#	-	-
pH	s.u.	06/11/2019	N001	53.00	7.49			#	-	-
Specific Conductance	umhos/cm	06/11/2019	N001	53.00	7838			#	-	-
Temperature	C	06/11/2019	N001	53.00	19.40			#	-	-
Turbidity	NTU	06/11/2019	N001	53.00	999.00			#	-	-
Uranium	mg/L	06/11/2019	0001	53.00	0.028		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0457 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/13/2019	0001	29.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	06/13/2019	N001	29.00	-133			#	-	-
pH	s.u.	06/13/2019	N001	29.00	7371.00			#	-	-
Specific Conductance	umhos/cm	06/13/2019	N001	29.00	5547			#	-	-
Temperature	C	06/13/2019	N001	29.00	18.75			#	-	-
Turbidity	NTU	06/13/2019	N001	29.00	3.80			#	-	-
Uranium	mg/L	06/13/2019	0001	29.00	0.0021		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: 0492 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/29/2019	0001	18.00	79				5	-
Ammonia Total as N	mg/L	05/29/2019	0002	14.86 - 19.79	81				5	-
Oxidation Reduction Potential	mV	05/29/2019	N001	18.00	295				-	-
pH	s.u.	05/29/2019	N001	18.00	6.98				-	-
Specific Conductance	umhos/cm	05/29/2019	N001	18.00	7470				-	-
Temperature	C	05/29/2019	N001	18.00	15.37				-	-
Turbidity	NTU	05/29/2019	N001	18.00	1.47				-	-
Uranium	mg/L	05/29/2019	0001	18.00	0.890				1.2E-05	-
Uranium	mg/L	05/29/2019	0002	14.86 - 19.79	0.860				0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: AMM-1 <well> NE corner of DOE property.

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/06/2019	0001	19.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/06/2019	N001	19.00	222			#	-	-
pH	s.u.	05/06/2019	N001	19.00	7.21			#	-	-
Specific Conductance	umhos/cm	05/06/2019	N001	19.00	12786			#	-	-
Temperature	C	05/06/2019	N001	19.00	20.81			#	-	-
Turbidity	NTU	05/06/2019	N001	19.00	1.07			#	-	-
Uranium	mg/L	05/06/2019	0001	19.00	0.0048		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: AMM-2 <well> East of pile along road.

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/09/2019	0001	48.00	480				20	-
Ammonia Total as N	mg/L	05/09/2019	0002	10.00 - 49.75	510				20	-
Oxidation Reduction Potential	mV	05/09/2019	N001	48.00	102				-	-
pH	s.u.	05/09/2019	N001	48.00	6.77				-	-
Specific Conductance	umhos/cm	05/09/2019	N001	48.00	25133				-	-
Temperature	C	05/09/2019	N001	48.00	16.43				-	-
Turbidity	NTU	05/09/2019	N001	48.00	3.86				-	-
Uranium	mg/L	05/09/2019	0001	48.00	2.600				0.00012	-
Uranium	mg/L	05/09/2019	0002	10.00 - 49.75	2.600				0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: ATP-2-D <well, piezometer> Piezometer; see boring ATP-2

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/07/2019	0001	90.00	430		J	#	10	-
Oxidation Reduction Potential	mV	05/07/2019	N001	90.00	-236			#	-	-
pH	s.u.	05/07/2019	N001	90.00	8201.00			#	-	-
Specific Conductance	umhos/cm	05/07/2019	N001	90.00	112571			#	-	-
Temperature	C	05/07/2019	N001	90.00	18.24			#	-	-
Turbidity	NTU	05/07/2019	N001	90.00	7.67			#	-	-
Uranium	mg/L	05/07/2019	0001	90.00	0.0016		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: ATP-2-S <well, piezometer> Piezometer; see boring ATP-2

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/07/2019	0001	25.00	400		J	#	10	-
Oxidation Reduction Potential	mV	05/07/2019	N001	25.00	-59			#	-	-
pH	s.u.	05/07/2019	N001	25.00	9.12			#	-	-
Specific Conductance	umhos/cm	05/07/2019	N001	25.00	14841			#	-	-
Temperature	C	05/07/2019	N001	25.00	17.91			#	-	-
Turbidity	NTU	05/07/2019	N001	25.00	20.50			#	-	-
Uranium	mg/L	05/07/2019	0001	25.00	0.0008		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: CR1 <surface location, river>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/28/2019	0001	0.00 - 0.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/28/2019	N001	0.00 - 0.00	248			#	-	-
pH	s.u.	05/28/2019	N001	0.00 - 0.00	7.59			#	-	-
Specific Conductance	umhos/cm	05/28/2019	N001	0.00 - 0.00	651			#	-	-
Temperature	C	05/28/2019	N001	0.00 - 0.00	14.24			#	-	-
Turbidity	NTU	05/28/2019	N001	0.00 - 0.00	213.00			#	-	-
Uranium	mg/L	05/28/2019	0001	0.00 - 0.00	0.0023		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: CR2 <surface location, river>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/28/2019	0001	0.00 - 0.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/28/2019	N001	0.00 - 0.00	251			#	-	-
pH	s.u.	05/28/2019	N001	0.00 - 0.00	8.14			#	-	-
Specific Conductance	umhos/cm	05/28/2019	N001	0.00 - 0.00	711			#	-	-
Temperature	C	05/28/2019	N001	0.00 - 0.00	15.06			#	-	-
Turbidity	NTU	05/28/2019	N001	0.00 - 0.00	242.00			#	-	-
Uranium	mg/L	05/28/2019	0001	0.00 - 0.00	0.0022		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: CR3 <surface location, river>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/29/2019	0001	0.00 - 0.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/29/2019	N001	0.00 - 0.00	277			#	-	-
pH	s.u.	05/29/2019	N001	0.00 - 0.00	8.02			#	-	-
Specific Conductance	umhos/cm	05/29/2019	N001	0.00 - 0.00	640			#	-	-
Temperature	C	05/29/2019	N001	0.00 - 0.00	14.07			#	-	-
Turbidity	NTU	05/29/2019	N001	0.00 - 0.00	181.00			#	-	-
Uranium	mg/L	05/29/2019	0001	0.00 - 0.00	0.0021		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: CR5 <surface location, river>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/30/2019	0001	0.00 - 0.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/30/2019	N001	0.00 - 0.00	115			#	-	-
pH	s.u.	05/30/2019	N001	0.00 - 0.00	8.26			#	-	-
Specific Conductance	umhos/cm	05/30/2019	N001	0.00 - 0.00	591			#	-	-
Temperature	C	05/30/2019	N001	0.00 - 0.00	14.17			#	-	-
Turbidity	NTU	05/30/2019	N001	0.00 - 0.00	6.98			#	-	-
Uranium	mg/L	05/30/2019	0001	0.00 - 0.00	0.0033		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: MW-3 <well> See borehole 8

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/19/2019	0001	44.00	390		J	#	10	-
Oxidation Reduction Potential	mV	05/19/2019	N001	44.00	165			#	-	-
pH	s.u.	05/19/2019	N001	44.00	6.81			#	-	-
Specific Conductance	umhos/cm	05/19/2019	N001	44.00	29153			#	-	-
Temperature	C	05/19/2019	N001	44.00	17.19			#	-	-
Turbidity	NTU	05/19/2019	N001	44.00	5.01			#	-	-
Uranium	mg/L	05/19/2019	0001	44.00	2.800		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-MW01 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/06/2019	0001	16.00	1.2		J	#	1	-
Oxidation Reduction Potential	mV	05/06/2019	N001	16.00	53			#	-	-
pH	s.u.	05/06/2019	N001	16.00	7.32			#	-	-
Specific Conductance	umhos/cm	05/06/2019	N001	16.00	5377			#	-	-
Temperature	C	05/06/2019	N001	16.00	15.31			#	-	-
Turbidity	NTU	05/06/2019	N001	16.00	20.80			#	-	-
Uranium	mg/L	05/06/2019	0001	16.00	3.200		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PW01 <well> Baseline Area

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/14/2019	0001	40.00	480		J	#	10	-
Oxidation Reduction Potential	mV	05/14/2019	N001	40.00				#	-	-
pH	s.u.	05/14/2019	N001	40.00				#	-	-
Specific Conductance	umhos/cm	05/14/2019	N001	40.00	16447			#	-	-
Temperature	C	05/14/2019	N001	40.00	18.69			#	-	-
Turbidity	NTU	05/14/2019	N001	40.00	2.69			#	-	-
Uranium	mg/L	05/14/2019	0001	40.00	2.100		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ1D2 <well> Baseline Area

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/14/2019	0001	73.00	1300		J	#	50	-
Oxidation Reduction Potential	mV	05/14/2019	N001	73.00	232			#	-	-
pH	s.u.	05/14/2019	N001	73.00	6.55			#	-	-
Specific Conductance	umhos/cm	05/14/2019	N001	73.00	101999			#	-	-
Temperature	C	05/14/2019	N001	73.00	17.10			#	-	-
Turbidity	NTU	05/14/2019	N001	73.00	16.80			#	-	-
Uranium	mg/L	05/14/2019	0001	73.00	1.100		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ1M <well> Baseline Area

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/09/2019	0001	57.00	750		J	#	20	-
Oxidation Reduction Potential	mV	05/09/2019	N001	57.00	148			#	-	-
pH	s.u.	05/09/2019	N001	57.00	6.72			#	-	-
Specific Conductance	umhos/cm	05/09/2019	N001	57.00	37238			#	-	-
Temperature	C	05/09/2019	N001	57.00	16.29			#	-	-
Turbidity	NTU	05/09/2019	N001	57.00	6.03			#	-	-
Uranium	mg/L	05/09/2019	0001	57.00	3.000		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ1S <well> Baseline Area

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/09/2019	0001	18.00	230		J	#	10	-
Oxidation Reduction Potential	mV	05/09/2019	N001	18.00	152			#	-	-
pH	s.u.	05/09/2019	N001	18.00	6.77			#	-	-
Specific Conductance	umhos/cm	05/09/2019	N001	18.00	12594			#	-	-
Temperature	C	05/09/2019	N001	18.00	13.72			#	-	-
Turbidity	NTU	05/09/2019	N001	18.00	4.77			#	-	-
Uranium	mg/L	05/09/2019	0001	18.00	1.300		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ2D <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/09/2019	0001	75.00	370		J	#	10	-
Oxidation Reduction Potential	mV	05/09/2019	N001	75.00	78			#	-	-
pH	s.u.	05/09/2019	N001	75.00	6.72			#	-	-
Specific Conductance	umhos/cm	05/09/2019	N001	75.00	111703			#	-	-
Temperature	C	05/09/2019	N001	75.00	16.67			#	-	-
Turbidity	NTU	05/09/2019	N001	75.00	4.03			#	-	-
Uranium	mg/L	05/09/2019	0001	75.00	0.290		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ2M2 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/09/2019	0001	56.00	480		J	#	10	-
Oxidation Reduction Potential	mV	05/09/2019	N001	56.00	194			#	-	-
pH	s.u.	05/09/2019	N001	56.00	6.72			#	-	-
Specific Conductance	umhos/cm	05/09/2019	N001	56.00	85333			#	-	-
Temperature	C	05/09/2019	N001	56.00	16.50			#	-	-
Turbidity	NTU	05/09/2019	N001	56.00	0.90			#	-	-
Uranium	mg/L	05/09/2019	0001	56.00	1.400		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: SMI-PZ3S <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/12/2019	0001	25.00	2.3		J	#	1	-
Oxidation Reduction Potential	mV	06/12/2019	N001	25.00	-18			#	-	-
pH	s.u.	06/12/2019	N001	25.00	8.04			#	-	-
Specific Conductance	umhos/cm	06/12/2019	N001	25.00	4275			#	-	-
Temperature	C	06/12/2019	N001	25.00	17.73			#	-	-
Turbidity	NTU	06/12/2019	N001	25.00	2.81			#	-	-
Uranium	mg/L	06/12/2019	0001	25.00	1.500		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-01 <well> Date, GR_Elev, Boring_Depth frm SMIDoc#2 (ORNL 1/9/98)

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/06/2019	0001	22.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/06/2019	N001	22.00	-11			#	-	-
pH	s.u.	05/06/2019	N001	22.00	7.54			#	-	-
Specific Conductance	umhos/cm	05/06/2019	N001	22.00	7142			#	-	-
Temperature	C	05/06/2019	N001	22.00	16.53			#	-	-
Turbidity	NTU	05/06/2019	N001	22.00	1.19			#	-	-
Uranium	mg/L	05/06/2019	0001	22.00	0.040		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

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

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/06/2019	0001	30.00	0.93		J	#	0.1	-
Oxidation Reduction Potential	mV	05/06/2019	N001	30.00	-109			#	-	-
pH	s.u.	05/06/2019	N001	30.00	7.33			#	-	-
Specific Conductance	umhos/cm	05/06/2019	N001	30.00	17459			#	-	-
Temperature	C	05/06/2019	N001	30.00	17.17			#	-	-
Turbidity	NTU	05/06/2019	N001	30.00	4.96			#	-	-
Uranium	mg/L	05/06/2019	0001	30.00	0.00069		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-17 <well> Date, GR_Elev, Boring_Depth frm SMIDoc#2 (ORNL 1/9/98)

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/29/2019	0001	28.00	2.2		J	#	1	-
Oxidation Reduction Potential	mV	05/29/2019	N001	28.00	-57			#	-	-
pH	s.u.	05/29/2019	N001	28.00	7.18			#	-	-
Specific Conductance	umhos/cm	05/29/2019	N001	28.00	833948			#	-	-
Temperature	C	05/29/2019	N001	28.00	14.31			#	-	-
Turbidity	NTU	05/29/2019	N001	28.00	7.15			#	-	-
Uranium	mg/L	05/29/2019	0001	28.00	0.026		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-20 <well> Date, GR_Elev, Boring_Depth frm SMIDoc#2 (ORNL 1/9/98)

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/14/2019	0001	32.00	4.1		J	#	1	-
Oxidation Reduction Potential	mV	05/14/2019	N001	32.00	-95			#	-	-
pH	s.u.	05/14/2019	N001	32.00	7.00			#	-	-
Specific Conductance	umhos/cm	05/14/2019	N001	32.00	127505			#	-	-
Temperature	C	05/14/2019	N001	32.00	20.60			#	-	-
Turbidity	NTU	05/14/2019	N001	32.00	19.30			#	-	-
Uranium	mg/L	05/14/2019	0001	32.00	0.0018		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-22 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/07/2019	0001	17.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	05/07/2019	N001	17.00	76			#	-	-
pH	s.u.	05/07/2019	N001	17.00	6.87			#	-	-
Specific Conductance	umhos/cm	05/07/2019	N001	17.00	29306			#	-	-
Temperature	C	05/07/2019	N001	17.00	17.88			#	-	-
Turbidity	NTU	05/07/2019	N001	17.00	94.60			#	-	-
Uranium	mg/L	05/07/2019	0001	17.00	0.330		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: TP-23 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/09/2019	0001	25.00	220		J	#	10	-
Oxidation Reduction Potential	mV	05/09/2019	N001	25.00	226			#	-	-
pH	s.u.	05/09/2019	N001	25.00	6.87			#	-	-
Specific Conductance	umhos/cm	05/09/2019	N001	25.00	46907			#	-	-
Temperature	C	05/09/2019	N001	25.00	17.59			#	-	-
Turbidity	NTU	05/09/2019	N001	25.00	8.62			#	-	-
Uranium	mg/L	05/09/2019	0001	25.00	2.300		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-17 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/12/2019	0001	14.50	49		J	#	1	-
Oxidation Reduction Potential	mV	06/12/2019	N001	14.50	-93			#	-	-
pH	s.u.	06/12/2019	N001	14.50	6.66			#	-	-
Specific Conductance	umhos/cm	06/12/2019	N001	14.50	7857			#	-	-
Temperature	C	06/12/2019	N001	14.50	17.24			#	-	-
Turbidity	NTU	06/12/2019	N001	14.50	5.11			#	-	-
Uranium	mg/L	06/12/2019	0001	14.50	1.300		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-18 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/12/2019	0001	13.00	160		J	#	5	-
Oxidation Reduction Potential	mV	06/12/2019	N001	13.00	-36			#	-	-
pH	s.u.	06/12/2019	N001	13.00	6.76			#	-	-
Specific Conductance	umhos/cm	06/12/2019	N001	13.00	10666			#	-	-
Temperature	C	06/12/2019	N001	13.00	17.78			#	-	-
Turbidity	NTU	06/12/2019	N001	13.00	6.32			#	-	-
Uranium	mg/L	06/12/2019	0001	13.00	1.200		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-20 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/12/2019	0001	17.00	0.1	U	J	#	0.1	-
Oxidation Reduction Potential	mV	06/12/2019	N001	17.00	-44			#	-	-
pH	s.u.	06/12/2019	N001	17.00	7.35			#	-	-
Specific Conductance	umhos/cm	06/12/2019	N001	17.00	3653			#	-	-
Temperature	C	06/12/2019	N001	17.00	20.74			#	-	-
Turbidity	NTU	06/12/2019	N001	17.00	20.20			#	-	-
Uranium	mg/L	06/12/2019	0001	17.00	0.056		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-21 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/13/2019	0001	25.00	1.4		J	#	1	-
Oxidation Reduction Potential	mV	06/13/2019	N001	25.00	55			#	-	-
pH	s.u.	06/13/2019	N001	25.00	7.30			#	-	-
Specific Conductance	umhos/cm	06/13/2019	N001	25.00	4593			#	-	-
Temperature	C	06/13/2019	N001	25.00	18.84			#	-	-
Turbidity	NTU	06/13/2019	N001	25.00	1.35			#	-	-
Uranium	mg/L	06/13/2019	0001	25.00	5.400		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-22 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/07/2019	0001	9.00	9.2		J	#	1	-
Oxidation Reduction Potential	mV	05/07/2019	N001	9.00	72			#	-	-
pH	s.u.	05/07/2019	N001	9.00	7.61			#	-	-
Specific Conductance	umhos/cm	05/07/2019	N001	9.00	5023			#	-	-
Temperature	C	05/07/2019	N001	9.00	16.97			#	-	-
Turbidity	NTU	05/07/2019	N001	9.00	21.10			#	-	-
Uranium	mg/L	05/07/2019	0001	9.00	2.300		J	#	0.00012	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-23 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	05/16/2019	0001	26.00	0.69		J	#	0.1	-
Oxidation Reduction Potential	mV	05/16/2019	N001	26.00	171			#	-	-
pH	s.u.	05/16/2019	N001	26.00	7.60			#	-	-
Specific Conductance	umhos/cm	05/16/2019	N001	26.00	3303			#	-	-
Temperature	C	05/16/2019	N001	26.00	19.19			#	-	-
Turbidity	NTU	05/16/2019	N001	26.00	9.09			#	-	-
Uranium	mg/L	05/16/2019	0001	26.00	0.580		J	#	1.2E-05	-

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE MOA01, Moab Site

LOCATION: UPD-24 <well>

REPORT DATE: 11/18/2019 4:12 PM

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	06/13/2019	0001	27.00	2.7		J	#	1	-
Oxidation Reduction Potential	mV	06/13/2019	N001	27.00	51			#	-	-
pH	s.u.	06/13/2019	N001	27.00	7.54			#	-	-
Specific Conductance	umhos/cm	06/13/2019	N001	27.00	44			#	-	-
Temperature	C	06/13/2019	N001	27.00	17.95			#	-	-
Turbidity	NTU	06/13/2019	N001	27.00	4.10			#	-	-
Uranium	mg/L	06/13/2019	0001	27.00	5.100		J	#	0.00012	-

RECORDS: SELECTED FROM USEE105 WHERE RIN = '1905114' AND (DataValidationQualifiers IS NULL OR (DataValidationQualifiers NOT LIKE '%N%' AND DataValidationQualifiers NOT LIKE '%R%' AND DataValidationQualifiers NOT LIKE '%X%'))

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

LAB QUALIFERS:

- * Replicate analysis not within control limits.
- \+ Correlation coefficient for MSA < 0.995.
- \> Result above upper detection limit.
- A TIC is a suspected aldol-condensation product.
- B Inorganic: Result is between the IDL and CRDL. Organic & Radiochemistry: 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
- M GFAA duplicate injection precision not met.
- N Inorganic or radiochemical: Spike sample recovery not within control limits. Organic: Tentatively identified compund (TIC).
- P > 25% difference in detected pesticide or Arochlor concentrations between 2 columns.
- S Result determined by method of standard addition (MSA).
- U Analytical result below detection limit.
- W Post-digestion spike outside control limits while sample absorbance < 50% of analytical spike absorbance.
- X Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Y Laboratory defined (USEPA CLP organic) qualifier, see case narrative.
- Z Laboratory defined (USEPA CLP organic) qualifier, see case narrative.

DATA QUALIFERS:

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

QA QUALIFIER: # = validated according to Quality Assurance guidelines.

Appendix D. May/June 2019 Site-wide Sampling Event (*continued*)
Water Level Data

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

REPORT DATE: NA

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	O	3969.6	6/6/2019	8.49	3961.11	
0403	O	3968.95	6/6/2019 5/14/2019	9.18 13.57	3959.77 3955.38	
0404	O	3968.3	6/6/2019 5/13/2019	9.39 12.57	3958.91 3955.73	
0406	O	3964.59	5/16/2019 5/13/2019	8.42 8.72	3956.17 3955.87	
0407	O	3969.09	6/6/2019	10.12	3958.97	
0410	O	3981.05	6/12/2019	20.9	3960.15	
0411	O	3962.43	6/12/2019	6.49	3955.94	
0412	O	3962.43	5/6/2019 5/13/2019	5.61 6.00	3956.82 3956.43	
0413	O	3963.19	5/6/2019 5/13/2019	7.57 7.30	3955.62 3955.89	
0414	O	3959.2	5/7/2019 5/13/2019	2.35 2.89	3956.85 3956.31	
0430	O	4022.1	6/11/2019 5/14/2019	60.63 60.79	3961.47 3961.31	
0432	O	4001.47	6/11/2019	41.74	3959.73	
0433	O	3989.99	6/11/2019	30.58	3959.41	
0434	O	3990.21	6/11/2019	32.31	3957.9	
0435	O	3971.67	6/13/2019	10.44	3961.23	
0440	O	4070.71	5/21/2019	111.58	3959.13	
0441	O	4008.77	6/11/2019 5/14/2019	48.95 49.44	3959.82 3959.33	
0443	O	4006.72	6/12/2019	46.81	3959.91	
0454	O	3966.53	5/7/2019 5/13/2019	11.49 11.27	3955.04 3955.26	
0455	O	3990.2	6/11/2019 5/14/2019	30.98 31.94	3959.22 3958.26	
0456	O	3990.46	6/11/2019	32.9	3957.56	
0457	O	3971.3	6/13/2019 5/13/2019	11.95 14.47	3959.35 3956.83	
0492	O	3967.56	5/29/2019 5/13/2019	11.41 12.61	3956.15 3954.95	
AMM-1	O	3972.02	5/6/2019 5/13/2019	15.62 15.51	3956.4 3956.51	
AMM-2	O	3964.09	5/9/2019 5/14/2019	8.73 9.00	3955.36 3955.09	

Appendix D. May/June 2019 Site-wide Sampling Event (*continued*)
Water Level Data (*continued*)

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

REPORT DATE: NA

Location Code	Flow Code	Top of Casing Elevation (Ft)	Measurement Date Range	Depth From Top of Casing (Ft)	Water Elevation (MSL)	Water Level Flag
ATP-2-D	O	3962.17	5/7/2019	5.4	3956.77	
ATP-2-S	O	3962.17	5/4/2019 5/13/2019	11.75 15.59	3950.42 3946.58	
MW-3	O	3965.98	5/16/2019	10.17	3955.81	
SMI-MW01	O	3960.22	5/6/2019 5/13/2019	3.69 3.83	3956.53 3956.39	
SMI-PW01	O	3963.96	5/14/2019	8.18	3955.78	
SMI-PZ1D2	O	3963.77	5/14/2019	8.12	3955.65	
SMI-PZ1M	O	3963.16	5/9/2019	6.69	3956.47	
SMI-PZ1S	O	3964.13	5/9/2019 5/13/2019	7.98 8.27	3956.15 3955.86	
SMI-PZ2M2	O	3967.18	5/9/2019	12.25	3954.93	
SMI-PZ2D	O	3967.38	5/9/2019	13.59	3953.79	
SMI-PZ3S	O	3975.03	6/12/2019 5/13/2019	14.14 18.21	3960.89 3956.82	
TP-01	O	3969.39	5/6/2019 5/13/2019	11.06 11.23	3958.33 3958.16	
TP-11	O	3967.51	5/6/2019 5/13/2019	14.14 10.35	3960.89 3957.16	
TP-17	O	3963.69	5/29/2019 5/13/2019	11.06 8.08	3958.33 3955.61	
TP-20	O	3967.55	5/14/2019 5/13/2019	13.69 13.56	3953.86 3953.99	
TP-22	O	3966.51	5/7/2019 5/13/2019	12.05 12.33	3954.46 3954.18	
TP-23	O	3962.60	5/9/2019 5/13/2019	7.44 7.50	3955.16 3955.10	
UPD-17	O	3967.44	6/12/2019 5/13/2019	6.28 11.66	3961.16 3955.78	
UPD-18	O	3969.00	6/12/2019 5/13/2019	9.25 11.75	3959.75 3957.25	
UPD-20	O	3978.73	6/12/2019 5/13/2019	19.53 21.48	3959.20 3957.25	
UPD-21	O	3981.45	6/13/2019	21.75	3959.70	
UPD-22	O	3966.20	5/7/2019	9.70	3956.50	
UPD-23	O	3982.38	5/16/2019 5/13/2019	25.55 25.45	3956.83 3956.93	
UPD-24	O	3977.10	6/13/2019	17.0	3960.1	

Flow Codes: B = background; C = cross gradient; D = downgradient; MSL = mean sea level O = on site; U = upgradient, Water Level Flags: D = dry, NA = data not available

Date: October 10, 2019
To: Ken Pill
From: A. McCarty
Subject: May 2019 Site Wide Sampling Event

Site: Moab – May/June 2018 Site-wide Sampling Event
Date of Sampling Event: May 6, 2019 – June 13, 2019
Team Members: N. Andrews, K. Pill, and J. Ritchey
RIN Number Assigned: All samples were assigned to RIN 1905114.
Sample Shipment: Four coolers were shipped overnight UPS to ALS Laboratory from Moab, Utah, on May 16 and 30 and on June 17 of 2019 (Tracking numbers, 1Z5W1Y510193130049, 1Z5W1Y510190134863, and 1Z5W1Y510195531157).

Number of Locations Sampled: The purpose of the Site Wide Sampling Event is to update contaminant plume maps. A total of 60 locations (eight surface samples and 52 monitoring wells) were sampled during this event. Including three duplicates and an equipment blank, a total of 64 samples were collected during the May 2019 Site Wide Sampling Event.

Locations Not Sampled/Reason: None.

Field Variance: None.

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

False ID	True ID	Sample Type	Associated Matrix
2000	AMM-2	Duplicate from 173 ft bgs	Ground Water
2001	0492	Duplicate from 18 bgs	Ground Water
2002	NA	Equipment Blank	De-ionized Water
2003	0435	Duplicate from 18 bgs	Ground Water

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 following table provides additional information.

Location	Date	Sample Depth (ft bgs)	Comments
0201	5/30/2019	NA	6ft out, 2ft deep, low velocity.
0218	5/28/2019	NA	10ft from shore, 2-3 ft deep, high flow.
0226	5/29/2019	NA	4ft from shore, 2-3ft deep, low velocity.
0274	5/29/2019	NA	4ft from shore, 2-3ft deep, low velocity.
0401	6/6/2019	18	Flush mount next to Well 0653
0403	6/6/2019	18	
0404	6/6/2019	18	
0406	5/16/2019	18	
0407	6/6/2019	18	
0410	6/12/2019	23.5	
0411	6/12/2019	8	Dewatered @ 0.25L. Sampled at a later time. Let refill @ 9:13.
0412	5/6/2019	9.5	Turbidity high in previous events. Didn't wait for it to drop.
0413	5/6/2019	10.5	
0414	5/7/2019	7.5	Collected conductivity in water pooled adjacent to well. Conductivity=1188 umhos/cm.
0430	6/11/2019	101	Bladder pump.
0432	6/11/2019	55	Bladder pump.
0433	6/11/2019	99	Bladder pump.
0434	6/11/2019	35	Bladder pump.
0435	6/13/2019	173	Bladder pump. Duplicate 2003 – MAY 064, Time: 14:00
0437	5/30/2019	(97)	Bladder pump.
0439	5/21/2019	118	Bladder pump. Pulled @ 11:08 to check, pump wasn't drawing water.
0440	5/21/2019	117	Bladder pump. Turbidity stabilized.
0441	6/11/2019	53	Bladder pump. Purging suspended for YSI battery change. Resumed at 13:40.
0443	6/12/2019	73	Bladder pump.
0453	5/21/2019	80	Bladder pump. Top of pump= 73.86 ft btoc. Water level below top of pump.
0454	5/7/2019	13	Sulfur odor. Dark water. Conductivity jumping around.
0455	6/11/2019	46	Inertia pump.
0456	6/11/2019	53	Inertia pump. WL from inside tubing.
0457	6/13/2019	29	
0492	5/29/2019	18	Duplicate 2001 – MAY 035, Time: 11:25
AMM-1	5/6/2019	19	
AMM-2	5/9/2019	48	Duplicate 2000 – MAY 017, Time: 12:30
ATP-2-D	5/7/2019	88	
ATP-2-S	5/7/2019	25	Conductivity jumping around.
CR1	5/28/2019	NA	10ft from shore, high flow, 2ft deep.
CR2	5/28/2019	NA	5ft from shore, 2ft deep, low flow.
CR3	5/29/2019	NA	3ft from shore, 1-2ft deep, low velocity.
CR5	5/30/2019	NA	4ft our, 4ft deep, low velocity.
MW3	5/16/2019	44	
SMI-MW01	5/6/2019	16	Turbidity not dropping.
SMI-PW01	5/14/2019	40	

Location	Date	Sample Depth (ft bgs)	Comments
SMI-PZ1D2	5/14/2019	73	Turbidity stabilized.
SMI-PZ1M	5/9/2019	57	
SMI-PZ1S	5/9/2019	18	
SMI-PZ2M2	5/9/2019	56	Conductivity jumping around.
SMI-PZ2D	5/9/2019	75	Conductivity jumping around.
SMI-PZ3S	6/12/2019	25	
TP-01	5/6/2019	22	Sulfur odor.
TP-11	5/6/2019	30	
TP-17	5/29/2019	28	Black floaties. Only a couple mosquitos!
TP-20	5/14/2019	32	Turbidity stable.
TP-22	5/7/2019	17	Dewatered @ 2.5L. Sample recharged water at later date.
TP-23	5/9/2019	25	
UPD-17	6/12/2019	14.5	
UPD-18	6/12/2019	13	
UPD-20	6/12/2019	17	
UPD-21	6/13/2019	25	
UPD-22	5/7/2019	9	Turbidity increased at the end.
UPD-23	5/16/2019	26	
UPD-24	6/13/2019	27	

Notes: ft bgs = feet below ground surface

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

Location	Date	Depth to Water (ft btoc)
0401	6/6/2019	8.49
0403	6/6/2019	9.18
0404	6/6/2019	9.39
0406	5/16/2019	8.42
0407	6/6/2019	10.12
0410	6/12/2019	20.90
0411	6/12/2019	6.49
0412	5/6/2019	5.61
0413	5/6/2019	7.57
0414	5/7/2019	2.35
0430	6/11/2019	60.63
0432	6/11/2019	41.74
0433	6/11/2019	30.58
0434	6/11/2019	32.31
0435	6/13/2019	10.44

Location	Date	Depth to Water (ft btoc)
0437	5/30/2019	47.58
0439	5/21/2019	52.92
0440	5/21/2019	111.58
0441	6/11/2019	48.95
0443	6/12/2019	46.81
0453	5/21/2019	*
0454	5/7/2019	11.49
0455	6/11/2019	30.98
0456	6/11/2019	32.90
0457	6/13/2019	11.95
0492	5/29/2019	11.41
AMM-1	5/6/2019	15.62
AMM-2	5/9/2019	8.73
ATP-2-D	5/7/2019	5.40
ATP-2-S	5/4/2019	11.75
MW3	5/16/2019	10.17
SMI-MW01	5/6/2019	3.69
SMI-PW01	5/14/2019	8.18
SMI-PZ1D2	5/14/2019	8.12
SMI-PZ1M	5/9/2019	6.69
SMI-PZ1S	5/9/2019	7.98
SMI-PZ2M2	5/9/2019	12.25
SMI-PZ2D	5/9/2019	13.59
SMI-PZ3S	6/12/2019	14.14
TP-01	5/6/2019	11.06
TP-11	5/6/2019	10.35
TP-17	5/29/2019	8.08
TP-20	5/14/2019	13.56
TP-22	5/7/2019	12.05
TP-23	5/9/2019	7.44
UPD-17	6/12/2019	6.28
UPD-18	6/12/2019	9.25
UPD-20	6/12/2019	19.53
UPD-21	6/13/2019	21.75
UPD-22	4/7/2019	9.70
UPD-23	5/16/2019	25.45
UPD-24	6/13/2019	17.0

*Water level could not be obtained.

Well Inspection Summary: A well inspection was not conducted.

Equipment: None.

Regulatory: None.

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

Date	Daily Mean Flow (cfs)
5/6/2019	12,500
5/7/2019	12,900
5/8/2019	13,500
5/9/2019	14,300
5/10/2019	13,300
5/11/2019	12,200
5/12/2019	11,200
5/13/2019	10,900
5/14/2019	11,400
5/15/2019	12,600
5/16/2019	13,900
5/17/2019	16,200
5/18/2019	18,600
5/19/2019	17,000
5/20/2019	14,800
5/21/2019	13,200
5/22/2019	13,000
5/23/2019	13,200
5/24/2019	13,800
5/25/2019	14,100
5/26/2019	14,200
5/27/2019	14,700
5/28/2019	15,400
5/29/2019	16,300
5/30/2019	16,600
5/31/2019	16,600
6/1/2019	17,000
6/2/2019	18,500
6/3/2019	21,400
6/4/2019	23,400
6/5/2019	25,400
6/6/2019	26,900
6/7/2019	29,000
6/8/2019	32,900
6/9/2019	36,600
6/10/2019	39,100
6/11/2019	37,500
6/12/2019	34,000
6/13/2019	32,700

Corrective Action Required/Taken: None.