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Office of Environmental Management – Grand Junction

UMTRA Project

Moab UMTRA Project
Groundwater and Surface Water Monitoring Report
July through December 2020

Revision 0

May 2021

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Moab UMTRA Project
Groundwater and Surface Water Monitoring Report July through December 2020

Revision 0

Review and Approval

5/4/2021

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Revision History

Revision	Date	Reason for Revision
0	May 2021	Initial issue.

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Acronyms and Abbreviations

bgs	below ground surface
CCB	continuing calibration blank
CCV	continuing calibration verification
CF	Configuration
cfs	cubic feet per second
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
ICP	inductively coupled plasma
ICV	initial calibration verification
IDL	instrument detection limit
LCS	laboratory control sample
LCSD	laboratory control sample duplicate
µmhos	micro mhos
MB	method blank
MDL	method detection limit
mg/L	milligrams per liter
MS	matrix spike
MSD	matrix spike duplicate
NELAC	National Environmental Laboratory Accreditation Conference
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
UMTRA	Uranium Mill Tailings Remedial Action

1.0 Introduction

1.1 Purpose

The purpose of this semi-annual report is to present the results and provide interpretation of the data 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 second half of calendar year 2020. The results of the data validation process are also presented.

Three sampling events were completed during this time frame. The first event included the collection of samples in September 2020 from the Configuration (CF) 4 monitoring wells, CF5 groundwater extraction wells, and surface water samples collected from the suitable habitat area that developed off the southern end of the well field. These locations are shown on Figure 1 and Figure 2.

The second event was associated with Crescent Junction wells 0202 and 0205 (Figure 3) sampling in December 2020 as part of the quarterly monitoring for the fourth quarter of calendar year 2020.

The third event started in December 2020 and was completed in February 2021, in which samples were collected from a variety of site-wide groundwater and surface water locations. Even though some locations were collected in 2021, all sample results associated with this event are presented in this report. Groundwater and surface water sampling locations are shown on Figures 4 and 5, 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, Minimums and Maximums Report, Water Quality Data, Water Level Data, and the trip report associated with the September 2020 habitat, CF4, and CF5 sampling event. Appendix B provides similar documentation for the December 2020 Crescent Junction event, and the documentation associated with the December 2020 through February 2021 site-wide sampling event, including the Blanks Report, is provided in Appendix C.

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, and river flows are reported as cubic feet per second (cfs).

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.

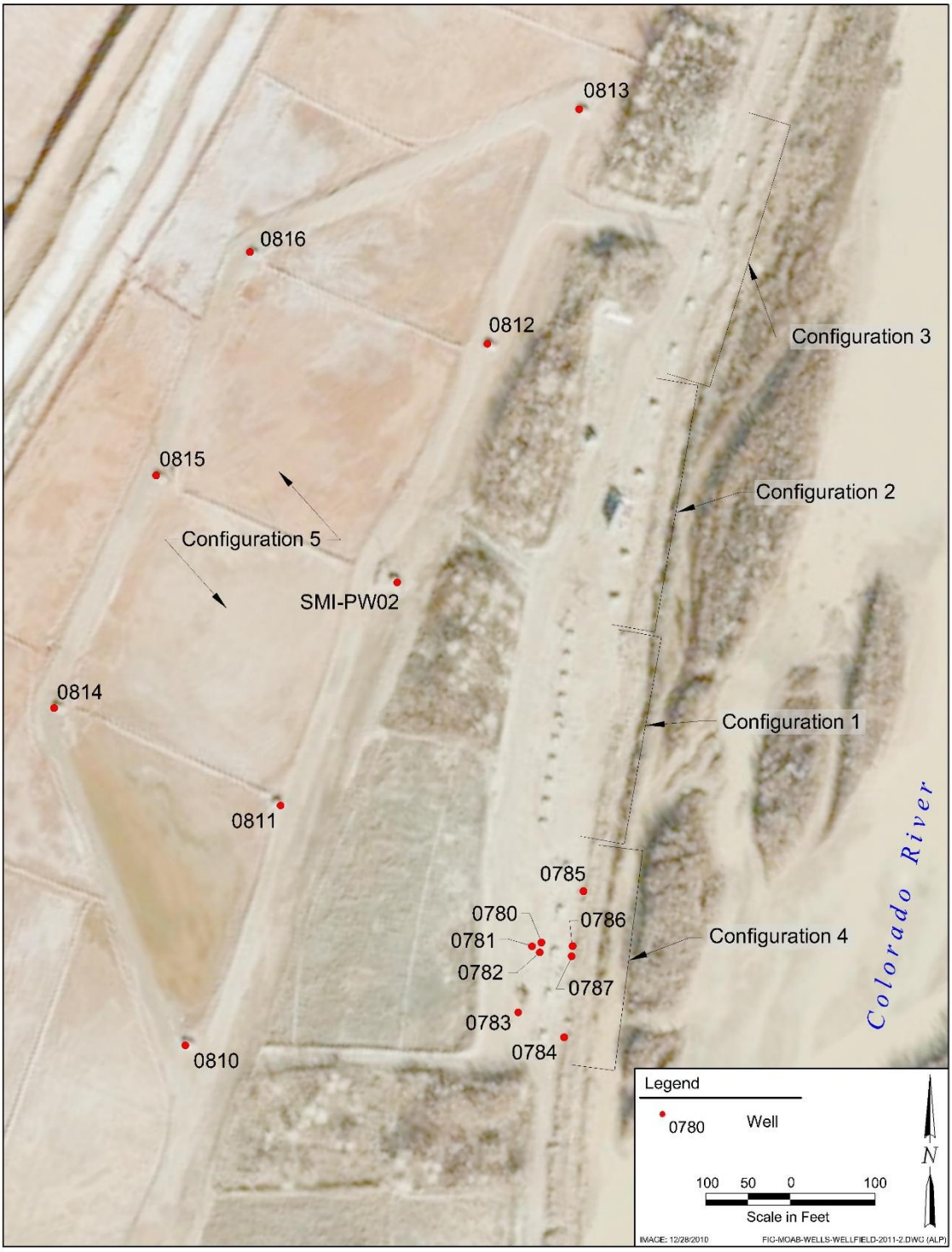

Figure 1. Second Half 2020 CF4 and CF5 Groundwater Sampling Locations

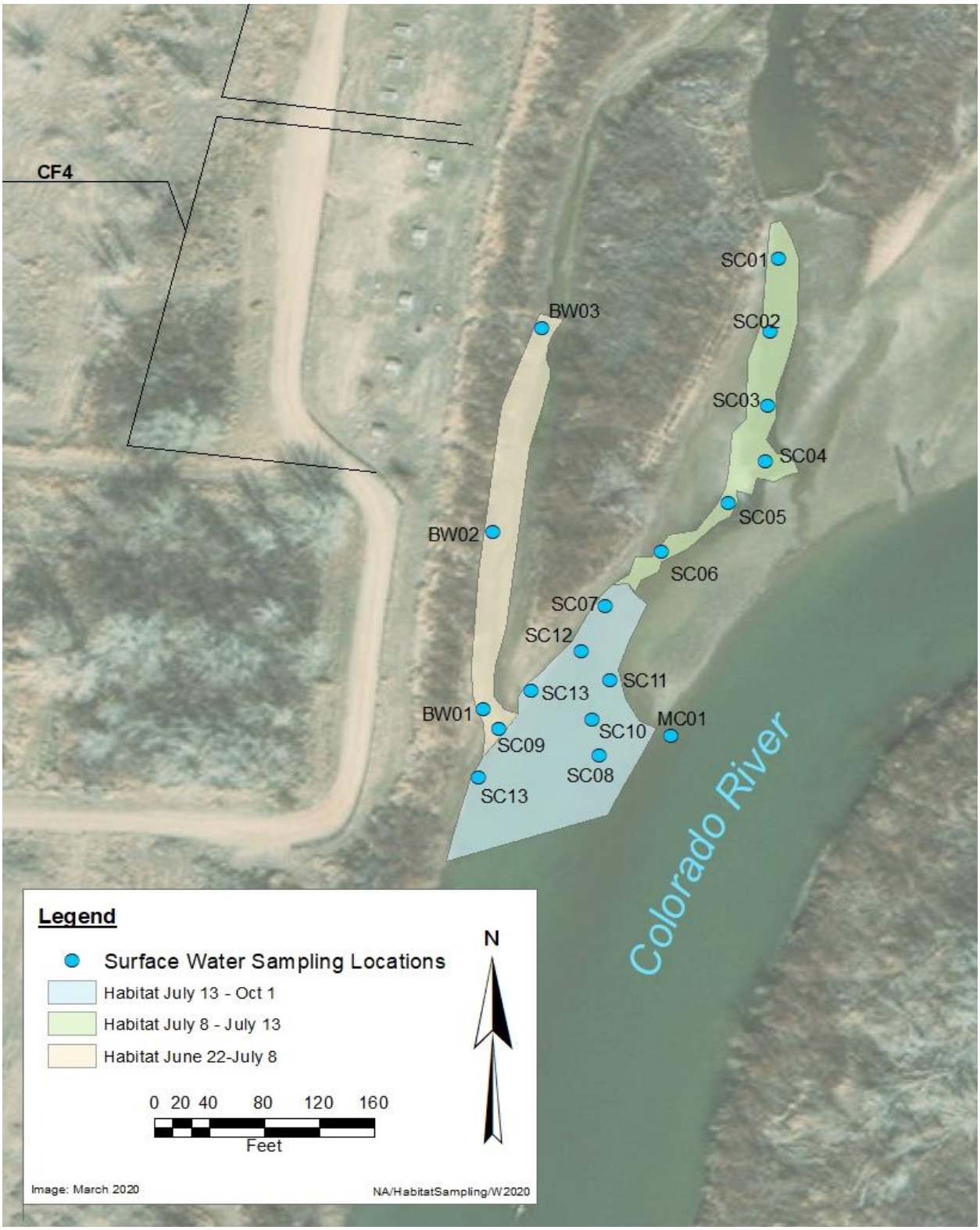

Figure 2. 2020 Habitat Sampling Locations

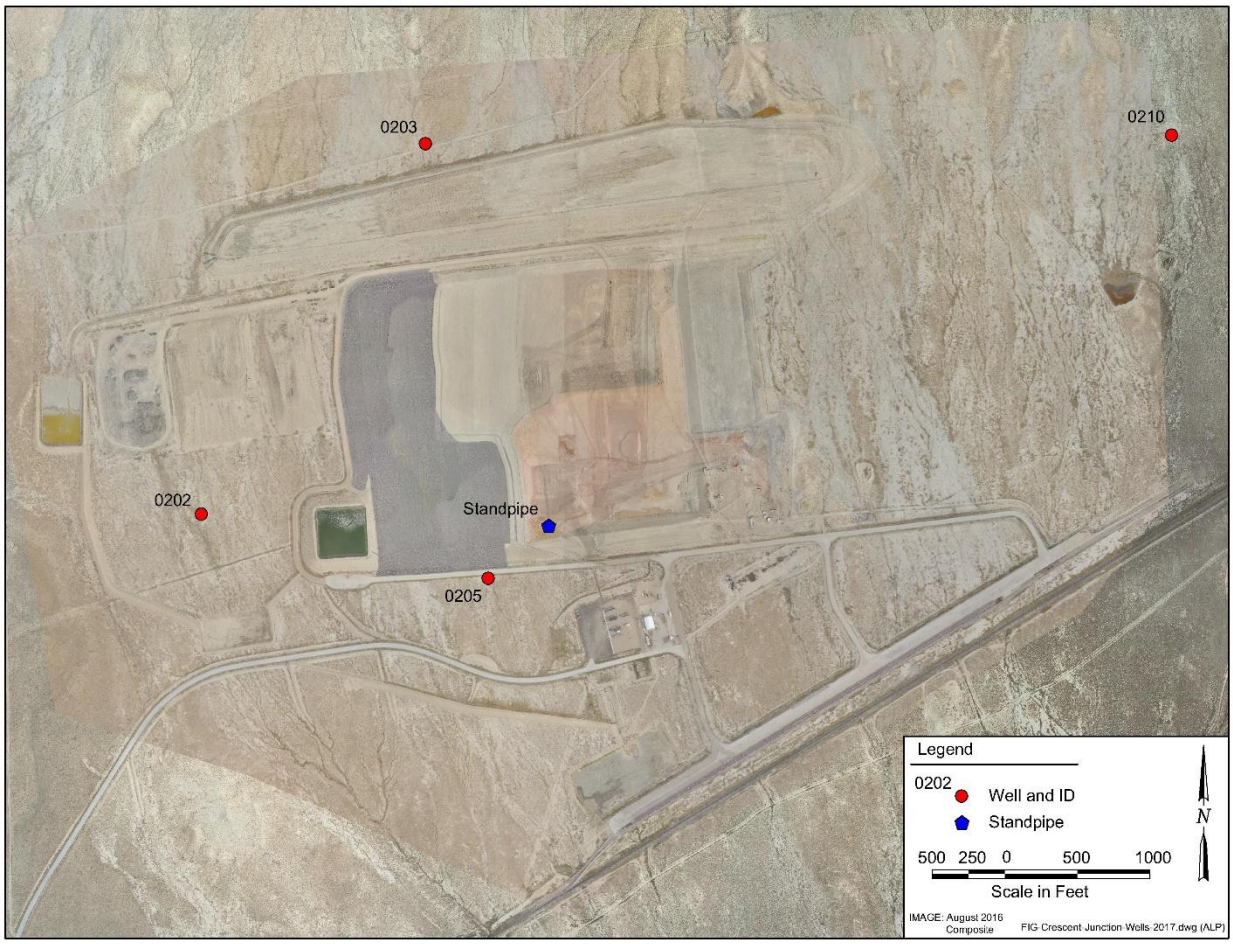

Figure 3. Crescent Junction Wells 0202 and 0205 Sampling Locations

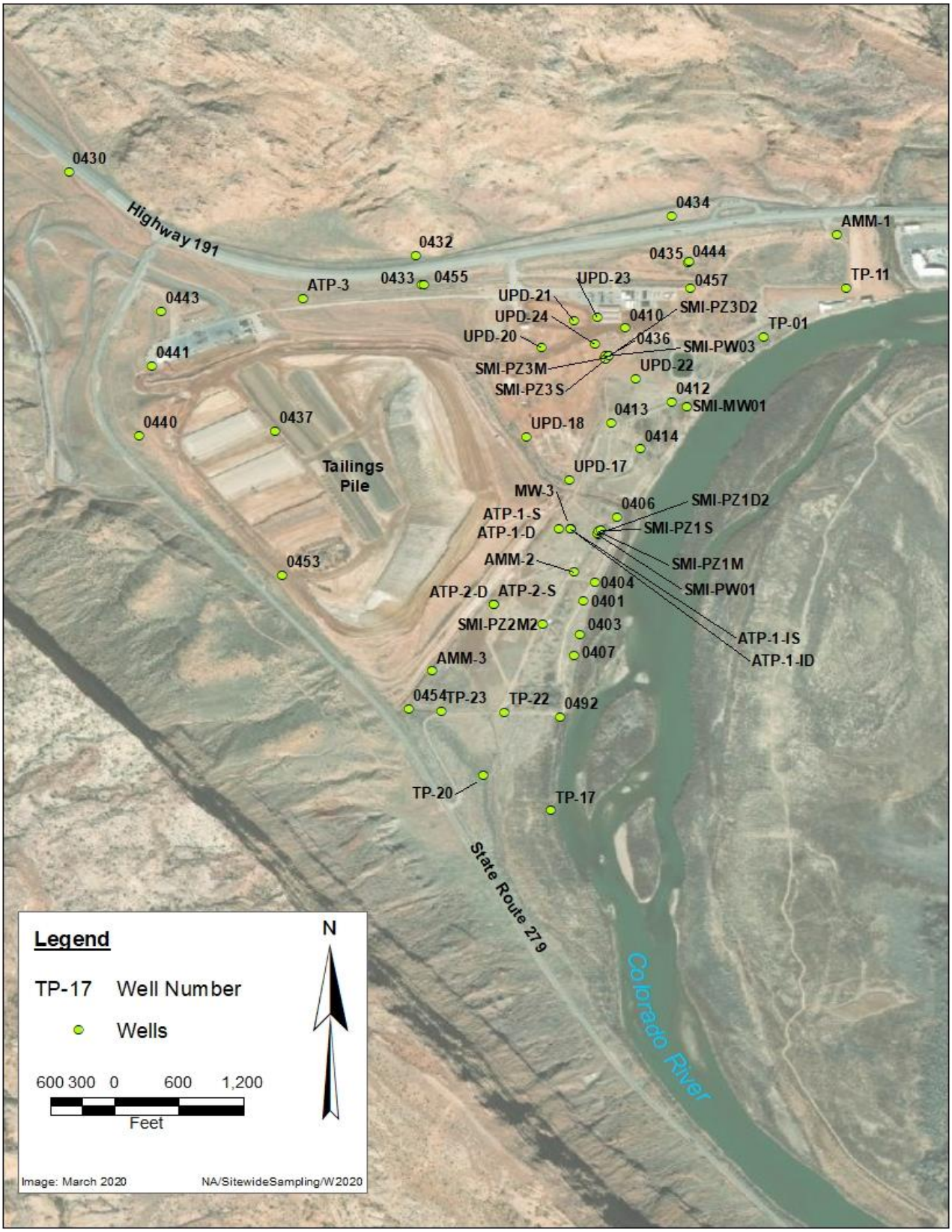

Figure 4. December 2020 through February 2021 Site-wide Groundwater Sampling Locations

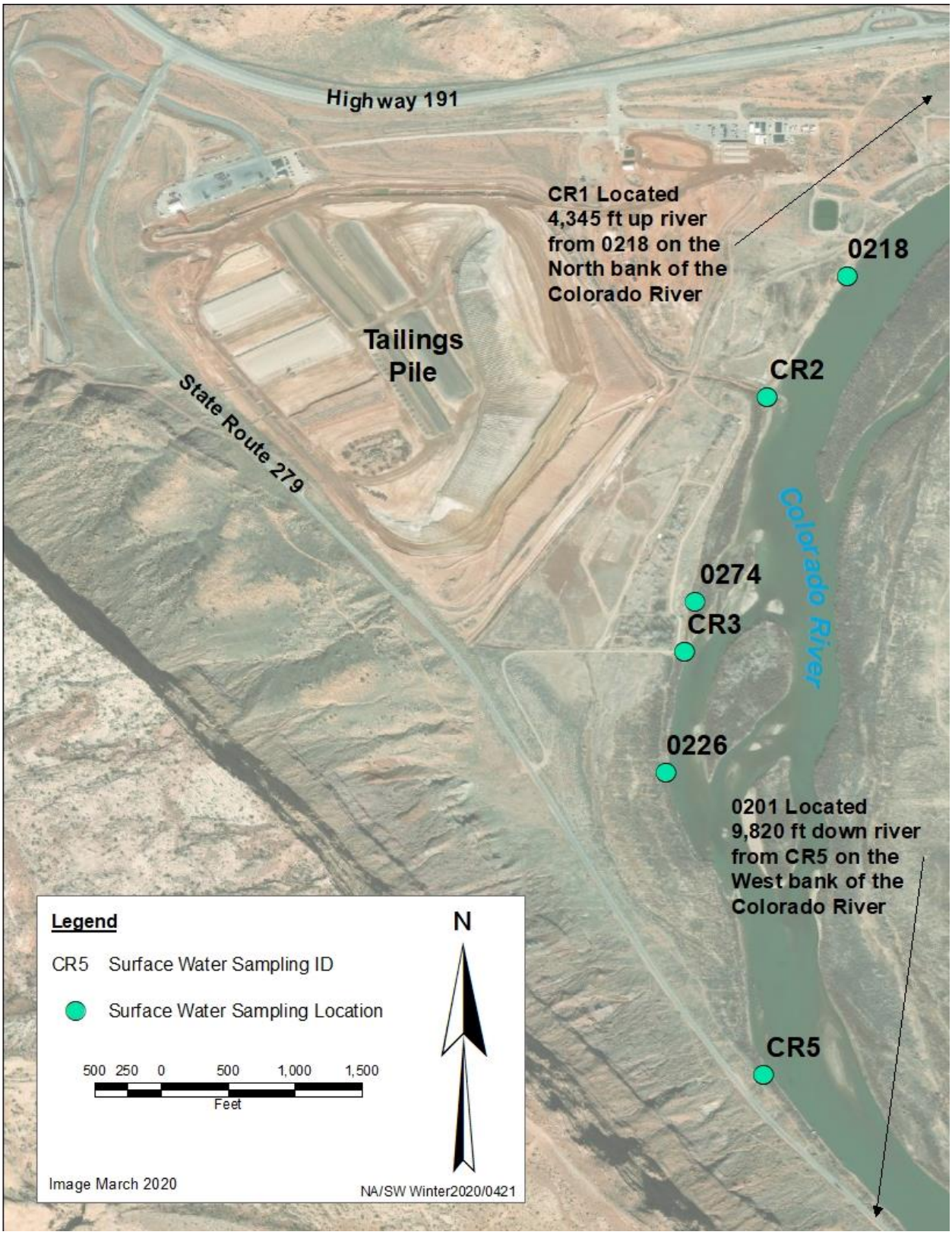

Figure 5. January/February 2021 Surface Water Sampling Locations

2.0 Summary of Sampling Events

2.1 September 2020 Habitat, CF4, and CF5 Sampling Event

Due to low 2020 spring runoff river flows, a suitable habitat developed in late June 2020 in the side channel off CF4. By early July, this side channel dried up as river flows decreased and an area to the east of this side channel developed into a suitable habitat. More than ninety samples were collected between late June and the end of September and analyzed using a field an ammonia probe. Four sample splits were collected for laboratory analysis as part of the September sampling event. All sample results are provided in Section 4.1 and Appendix A, along with a narrative and figures providing the sampling locations, also seen in Figure 2.

Groundwater samples were also collected from the eight CF4 monitoring wells to determine the impact of the freshwater injection system on the shallow aquifer. Due to the need to use the injection system water to enhance the surface water diversion system in addition to a variety of sand filter maintenance issues, the freshwater injection system was operational only one week since early July 2020 and when the sampling occurred. These ground water samples were collected to determine how long the freshwater injection system impacts shallow zone ammonia concentrations, particularly downgradient of the CF4 injection wells. Samples were also collected from the eight CF5 ground water extraction wells during the later stages of the 2020 operation of the groundwater extraction system. The system was restarted in mid-March and consistently ran until mid-November, and results from this event were used to update the mass removal calculations.

2.2 December 2020 Crescent Junction Sampling Event

Groundwater samples were collected from wells 0202 and 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. Samples were analyzed for metals, inorganics, and isotopic uranium.

2.3 December 2020 through February 2021 Site-wide Sampling Event

Seventy-two groundwater and surface water samples were collected as part of the site-wide event. This event corresponds to the time frame when the Colorado River is generally experiencing base flow conditions. The 65 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 plume were also included. The seven surface water samples were collected upstream, downstream, and adjacent to the site during this event. All samples were submitted to ALS Global Laboratory for ammonia and uranium analysis. Samples from select locations (based on historical results) were also analyzed for arsenic and selenium.

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) are qualified "J" when the detections are less than five times the blank concentration. Non-detects are 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
Laboratory Control Sample Duplicates (LCSDs) that contain known concentrations of the analyte of interest are prepared in the laboratory. Matrix spike (MS) samples may not be generated due to a limited sample volume. Instead, laboratory control sample duplicates LCSDs are performed. 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 National Environmental Laboratory Accreditation Institute, a 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 re-run 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 September 2020 Habitat, CF4, and CF5 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

RIN	2009122
Laboratory:	ALS Analytics, Fort Collins, Colorado
SDG Number:	2010062
Analysis:	Metals and Inorganics
Validator:	Nina Andrews
Review Date:	April 2021

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

Table 1. September 2020 Habitat, CF4, and 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 2. Refer to Table 3 for an explanation of the data qualifiers applied.

Table 2. September 2020 Habitat, CF4, and CF5 Sampling Event, Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
SDG 2010062 1 through 17	All in SDG 2010062	Ammonia	J	MSD-1
SDG 2010062-17	SC08	Ammonia	J	CCB-1
SDG 2010062 1 through 17	All in SDG 2010062	Uranium	J	MS-1, MSD-2, SD-1

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

Table 3. September 2020 Habitat, CF4, and CF5 Sampling Event, Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-detects)	Explanation
MS-1	J	UJ	The MS sample chosen was from another client.
MSD-1	J	UJ	No MSD data was included in the narrative.
MSD-2	J	UJ	The MSD sample chosen from another client.
SD-1	J	N/A	No SD was run with the sample group.
CCB-1	J	N/A	The location result was <5x the highest CCB

Notes: "J" indicates results are estimated; it becomes "UJ" for analytical results lower than the detection limit. U indicates the result is below the detection limit.

Sample Shipping/Receiving

ALS Analytics in Fort Collins, Colorado, received a total of 17 samples for RIN 2009122 in one shipment; tracking number 1Z5W1Y510195207061 on 10/2/20.

The sample data group (SDG) was accompanied by a Chain of Custody (COC) form. The COC form was checked to confirm that all of the samples were listed on the form with sample collection dates and times, and that signatures and dates were present indicating sample relinquishment and receipt.

Preservation and Holding Times

SDG 2010062 was received intact with a temperature of 1.6°C. All samples were received in the correct container types and all samples were analyzed within the applicable holding times.

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 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 3 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. Internal standard recoveries were stable and within acceptable ranges.

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 a correlation coefficient (r^2) value greater than 0.995. ICV and CCV checks were made at the required frequency. All calibration checks met the acceptance criteria.

Method and Calibration Blanks

Method blanks (MBs) are analyzed to assess any contamination that may have occurred during sample preparation. Both initial calibration blanks (ICB) and continuing calibration blanks (CCBs) are analyzed to assess instrument contamination prior to and during sample analysis. CCBs were made at the required frequency for ammonia in SDG 2010062. All detect sample results associated with the blanks results greater than 5x the MDL or IDL are flagged J reason CCB-1. This was the case at one location; 20100622-17 (SC08).

All CCBs for uranium were made at the required frequency for SDG 2010062 and none were above the MDL so no sample results were qualified or flagged.

Matrix Spike Analysis

Sample locations 2010062-1 (0780), 2010062-4 (0783), and 2010062-13 (0814) were chosen for the ammonia matrix spike analysis. The correct amount of matrix spikes were analyzed for the amount of samples in these SDGs. All three passed for the correct percent recovery.

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 were flagged J for reason MS-2.

Laboratory Replicate Analysis

The uranium SDGs did not contain a MSD sample. Therefore, all of the uranium data are flagged "J" for reason MSD-2.

Even with three matrix spikes performed for the ammonia SDG, a matrix spike duplicate was not performed and data were flagged "J" for reason MSD-2.

Field Duplicate Analysis

A duplicate sample was collected from location 2010062-13 (0814). The duplicate results met the U.S. EPA recommended laboratory duplicate criteria of less than 20 percent RPD for results that are greater than 5x the RL.

Laboratory Control Samples

LCS results were acceptable for ammonia analyses. LCSs were not reported for uranium. Per requirements provided by the National Environmental Laboratory Accreditation Conference (NELAC) Institute, an MS may be used in place of an LCS provided the acceptance criteria are as stringent.

Metals Serial Dilution

Since no serial dilution 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
Electronic Data Deliverable (EDD) files arrived October 31, 2020. 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.

3.1.2 Minimums and Maximums Report and Anomalous Data Review
Appendix A 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.

3.2 December 2020 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	2012123
Laboratory:	ALS Analytics, Fort Collins, Colorado
SDG Numbers:	2012257
Analysis:	Metals, Inorganics, Isotopic Uranium
Validator:	Nina Andrews
Review Date:	April 2021

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

Table 4. December 2020 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. December 2020 Crescent Junction Sampling Event, Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
SDG 2012257	0202, 0205	Inorganics	J	MS-1, MSD-1
SDG 2012257	0202, 0205	All Metals	J	MS-1, MSD-1, SD-1
SDG 2012257	0202, 0205	Isotopic Uranium	J	MS-1, MSD-1, SD-1

Notes: “J” indicates results are estimated; it becomes “UJ” for analytical results lower than the detection limit.

Table 6. December 2020 Crescent Junction Sampling Event, Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-detects)	Explanation
MS-1	J	UJ	The MS sample chosen was from another client and not included in the narrative.
MSD-1	J	UJ	No MSD data was included in the narrative.
SD-1	J	N/A	Serial dilution analysis was not conducted on any samples.

Notes: “J” indicates results are estimated; it becomes “UJ” for analytical results lower than the detection limit. U indicates the result is below the detection limit.

Sample Shipping/Receiving

ALS Analytics in Fort Collins, Colorado, received two samples for RIN 2012123 in a shipment of one cooler. The shipment (SDG 2012257) contained one ground water sample from Crescent Junction well 0202 and another from well 0205. The temperature of the cooler was 0.7°C and it arrived on December 11, 2020 (Tracking number 1Z5W1Y510195725500).

The COC forms were checked to confirm that all of the samples were listed on the form with sample collection dates and times, and 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 preserved correctly for the requested analyses. All samples were analyzed within the applicable holding time.

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

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.

For all analyses, the selected quality control (QC) samples were 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 data are flagged J for reasons MS-1, MSD-1, and metals and isotopic uranium data were also flagged for reason SD-1.

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

Electronic Data Deliverable File
The EDD files arrived on January 15, 2021. 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.

3.2.2 Minimums and Maximums Report and Anomalous Data Review
The Minimums and Maximums Report for this sampling event is located in Appendix B. There was one anomalous data point (Table 7), based on the isotope uranium-234 result in the sample collected from well 0205 which was more than 50% above the historical maximum.

Table 7. Anomalous Data Associated with the December 2020 Crescent Junction Sampling Event

Location	Sample Date	Analyte	Concentration (pCi/L)	Historical Minimum (mg/L)	Historical Maximum (mg/L)	Disposition
0205	12/08/2020	U-234	63	27.1	35.7	Location is scheduled to be resampled in 2021.

3.3 December 2020 through February 2021 Site-wide 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 2012124
Laboratory: ALS Analytics, Fort Collins, Colorado
SDG Numbers: 2012426, 2101343, 2102118, 2102479
Analysis: Metals and Inorganics
Validator: Nina Andrews
Review Date: March 2021

The samples were prepared and analyzed using accepted procedures as shown in Table 8. Analytical results were qualified as listed in Table 9. Refer to Table 10 for an explanation of the data qualifiers applied.

Table 8. December 2020 through February 2021 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
Arsenic	SW-846 3005A	ICP-MS 6020B
Selenium	SW-846 3005A	ICP-MS 6020B

Table 9. December 2020 through February 2021 Site-wide Sampling Event, Data Qualifiers

Sample Number	Location	Analyte	Flag	Reason
2012426-1 through 17 2101343 -1 through 18 2102118 -1 through 14 2102479 -1 through 29	All metals	Uranium, Arsenic and Selenium	J	MS-1, MSD-1, SD-1
2101343-1 through 18 2102479-1 through 29	All in SDG 2101343 and SDG 2102479	Ammonia	J	MS-2, MSD-1
2012426 -1 through 17 2102118-1 through 14	All in SDG 2012426 and SDG 2102118	Ammonia	J	MSD-1

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

Table 10. December 2020 through February 2021 Site-wide Sampling Event, Reason Codes for Data Flags

Reason Code	Qualifier (Detects)	Qualifier (Non-detects)	Explanation
SD-1	J	U	No serial dilutions 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.

Notes: "J" indicates results are estimated and becomes "UJ" for analytical results lower than the detection limit. U indicates the result is below the detection limit.

Sample Shipping/Receiving

ALS Analytics in Fort Collins, Colorado, received a total of 78 samples for RIN 2012124 in four shipments (Table 11).

Table 11. December 2020 through February 2021 Site-wide Sampling Event, Sample Shipping/Receiving

SDG	Number of Samples	Date Shipped	UPS Tracking Number
2012426	17	12/17/2020	1Z5W1Y510191815376
2101343	18	1/19/2021	1Z5W1Y510191997804
2102118	14	2/4/2021	1Z5W1Y510194231429
2102479	29	2/25/2021	1Z5W1Y510199608399

The four 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 2012426 was received with a temperature of 0.9°C, SDG 2101343 was received with a temperature of 0.3°C, SDG 2102118 was received with a temperature of 4.3°C, and SDG 2102479 was received with a temperature of 3.7°C. All four SDGs were received with compliant temperatures. All samples were received in the correct container types. All samples were analyzed within the applicable holding times.

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

ICV and CCV checks were made at the required frequency. All calibration checks met the acceptance criteria. 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 ICP-MS 6020B, Arsenic and Selenium

ICV and CCV checks were made at the required frequency. All calibration checks met the acceptance criteria.

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

All but eleven CCBs for ammonia reported lower than the IDL. Of the eleven that reported higher than the IDL when data were compared (?) to five times their result none was flagged because all sample results that were lower than that value were at non-detect level. No ammonia results were flagged.

One CCB for uranium in SDG 2012426 and one in SDG 2102479 were higher than the IDL. None of the associated sample results were less than five times the blank concentrations, thus none were flagged. All CCBs for uranium in SDGs 2101343 and 2102118 reported lower than the IDL, so no uranium results were flagged.

All CCBs for arsenic on all four SDGs reported lower than the IDL, so no arsenic results were flagged. In addition, all CCBs for selenium on all four SDGs reported lower than the IDL, so no selenium results were flagged.

Equipment Blanks

One equipment blank (location 2003, 2102118-15) was collected after the surface water sample tubing was decontaminated. The result had 0.2 mg/L of ammonia (which is the reporting limit) and all the surface water samples also had either 0.2 mg/L of ammonia or greater, so none were flagged. The result had 0.011 mg/L of uranium (which is less than the reporting limit) and all the surface water sample results were under the reporting limit, so none were flagged.

Matrix Spike Analysis

For all of the uranium, arsenic, and selenium results, 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 metals data on was flagged J for reason MS-1.

Two of the four ammonia SDGs (2101343 and 2102479) had a low recovery on the matrix spike analysis. Therefore, all of the ammonia data in SDGs 2101343 and 2102479 have been flagged J for reason MS-2.

Laboratory Replicate Analysis

The metals results did not contain an MS or MSD sample. Therefore, all of the uranium, arsenic, and selenium data were flagged "J" for reason MSD-1. For ammonia there were no matrix spike duplicates run for any of the SDGs, so all samples were flagged for MSD-1 (lack of matrix spike duplicates).

Field Duplicate Analysis

Duplicate samples were collected from locations SMI-PZ1D2 (2012426-17), 0407 (2101343-3), 0492 (2102118-14), and UPD-24 (2102479-55). The duplicate results met the EPA recommended laboratory duplicate criteria of less than 20 percent RPD for results that are greater than 5 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. Since no MSs were run for uranium,

arsenic, or selenium results from all SDGs were flagged MS-1 and could also not be used instead of the LCS.

Metals Serial Dilution
Since no serial dilution samples were run on the uranium, arsenic, or selenium samples in any of the SDGs, all the metals 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 EDD files arrived January 15, February 25, February 23, and March 12, 2021, respectively, for SDGs 2012426, 2101343, 2102118, and 2102479. 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.

3.3.2 Minimums and Maximums Report and Anomalous Data Review

The Minimums and Maximums Report for this sampling event is located in Appendix C. Based on the definition of an anomalous data point, there were four anomalous data points associated with this event (Table 12). Well 0414 had a selenium concentration 50% below the historical minimum, and well ATP-1-D had an ammonia concentration that was 50% above the historical maximum. In addition, surface water sampled from location CR-1 contained ammonia and uranium concentrations 50% above the historical maximums.

Table 12. Anomalous Data Associated with the December 2020 through February 2021 Site-wide Sampling Event

Location	Sample Date	Analyte	Concentration (mg/L)	Historical Minimum (mg/L)	Historical Maximum (mg/L)	Disposition
0414	02/09/2021	Selenium	0.022	0.045	0.205	Concentration has been gradually decreasing since 2019, will continue monitoring.
ATP-1-D	01/05/2021	Ammonia Total as N	8.5	3.3	4	Only fourth time sampled since 2002, will continue monitoring.
CR-1	01/27/2021	Ammonia Total as N	1.6	0.003	1.0	Sample collected from the background surface water sampling location, results represent background concentration.
CR-1	01/27/2021	Uranium	0.048	0.0013	0.008	

4.0 Results

Results from the three sampling events are presented in Sections 4.1, 4.2, and 4.3.

4.1 September 2020 Habitat, CF4, and CF5 Sampling Event Results

Habitat Sampling

Four sample splits from locations SC08, SC11, SC12, and SC13 (Figure 2) were submitted to the laboratory from the September 2020 event. These samples were also analyzed using the ammonia probe and a comparison of the results are presented in Table 13. Each utilizes different analytical methods and was done for a comparative analysis. The ALS results have a detection limit of 0.2 mg/L. Three of the four sample splits had lower results than this limit and were thus reported as non-detect.

Table 13.Surface Water Ammonia Probe and Analytical Laboratory Result Comparison

Location	Ammonia Probe Results (NH3 mg/L)	Analytical Lab Results (NH3 mg/L)
SC08	0.48	0.24
SC11	0.34	ND
SC12	0.13	ND
SC13	0.21	ND

Notes: * = Result below the 0.2 mg/L detection limit.

All the ammonia probe results are included in Appendix A, along with a sampling narrative.

CF4 Sampling

The eight monitoring wells surrounding the CF4 freshwater injection wells (Figure 1) were sampled in September. In addition, these wells were also sampled in January 2021, and these results are presented in this Section for comparison purposes. The September samples were collected after the system was inactive nearly three months prior to the sample collection, and only approximately 200,000 gal were injected during the previous four months. January 2021 samples were collected after only 45,000 gal of freshwater had been injected since the September samples were collected. Operation of the system was limited due to utilizing the injection system to enhance the surface water diversion system and ongoing issues with the sand filter. The injection pump also experienced an electrical failure preventing operation until replacement.

The CF4 wells are screened and deliver fresh water into the subsurface from 15 to 35 ft below ground surface (bgs). September 2020 ammonia concentrations associated with the downgradient samples collected from a depth less than 20 ft bgs (wells 0784 and 0785) had concentrations that were below the 0.2 mg/L detection limit and 3 mg/L, respectively, clearly indicating the injection system activity impacts this subsurface zone. The sample from the upgradient shallow zone (from well 0783) was also below 5 mg/L, providing further evidence of the lasting impact the system has on the groundwater system even after more than 3 months of minimal activity. Samples collected from wells 0780 and 0786 (28 ft bgs) and well 0782 (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).

By January 2021, only another 45,000 gal of freshwater had been injected into the subsurface since the September 2020 event. Ammonia concentrations by this time, after minimal injection system operations for 6 months (since July 2020), had returned to close to baseline conditions.

September 2020 and January 2021 ammonia concentrations are displayed on Figures 6 and 7 (respectively) and presented in Table 14. Baseline concentrations represent sample results from January 2019, when limited freshwater was injected (less than 750,000 gal) for the six months leading up to the sample collection. The results indicate the conditions were similar in September 2020.

Table 14. CF4 Monitoring Well Ammonia Concentrations, September 2020 and January 2021

Location	Sample Depth (ft bgs)	Upgradient or Downgradient of Injection Wells	Baseline* Concentration (mg/L)	September 2020 Ammonia Concentration (mg/L)	January 2021 Ammonia Concentration (mg/L)
0780	28	Upgradient	330	310	250
0781	46	Upgradient	1,900	1,500	1,200
0782	33	Upgradient	1,100	440	290
0783	18	Upgradient	20	4.1	60
0784	18	Downgradient	1.1	<0.2	5.1
0785	18	Downgradient	17	3.0	88
0786	28	Downgradient	480	500	450
0787	36	Downgradient	2,100	1,900	1,200

Notes: * = Baseline concentrations taken from samples collected August 2010, prior to when the CF4 wells were used exclusively for injection purposes.

Figure 8 displays the ammonia concentrations in samples collected down gradient from a depth of 18 ft bgs (wells 0784 and 0785) since 2016, along with the CF4 weekly injected volume. The 18 ft bgs depth is the most relevant to the protection of any suitable habitat that may develop, since this depth is approximately the same elevation of the base of the main river channel. As the plot displays, even when the injection system operations are limited or suspended for long periods of time, the shallow groundwater concentrations tend to remain low. However, after over 6 months of minimal freshwater injection, the concentrations significantly increased and were equivalent to baseline concentrations.

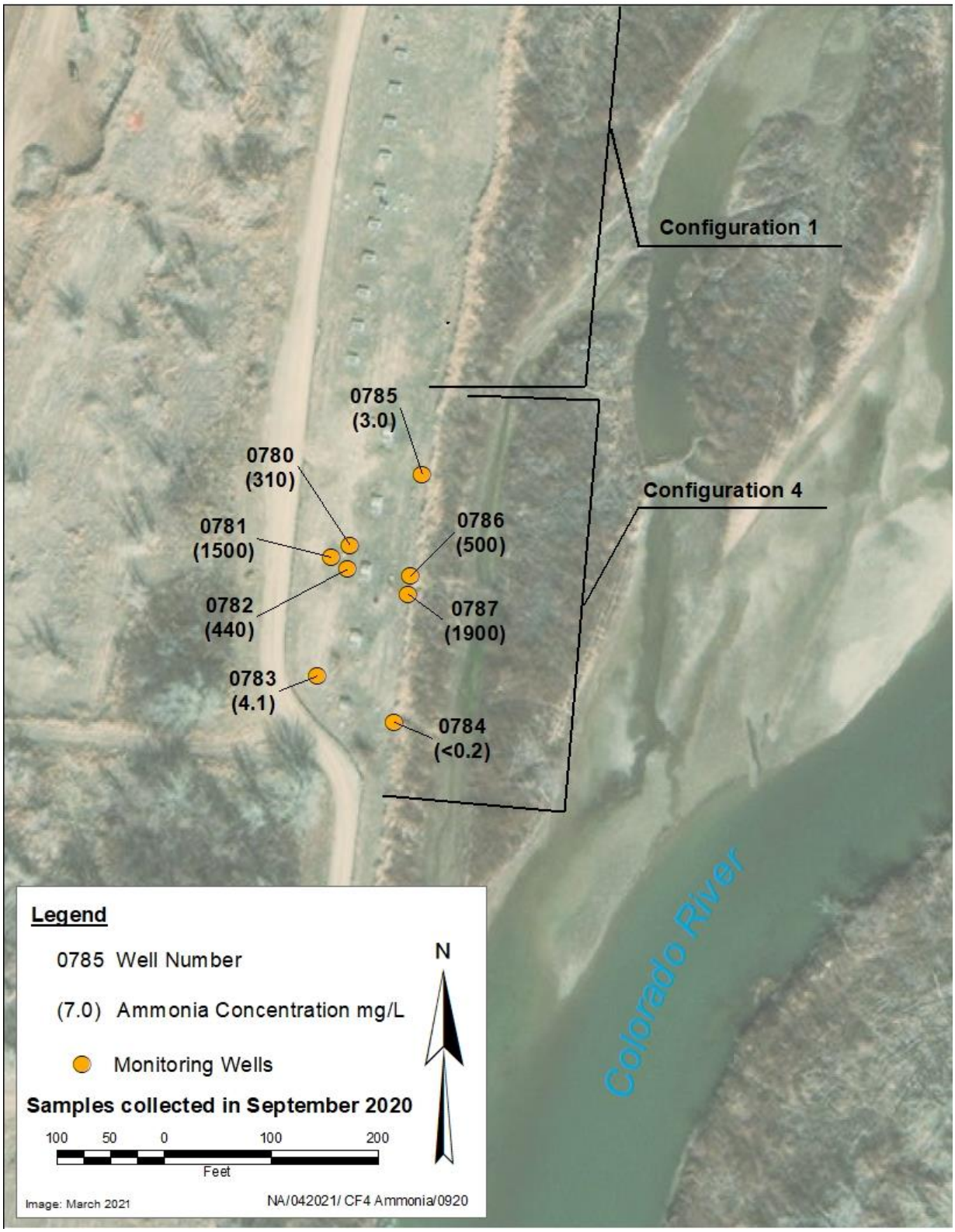

Figure 6. September 2020 CF4 Ammonia Groundwater Concentrations

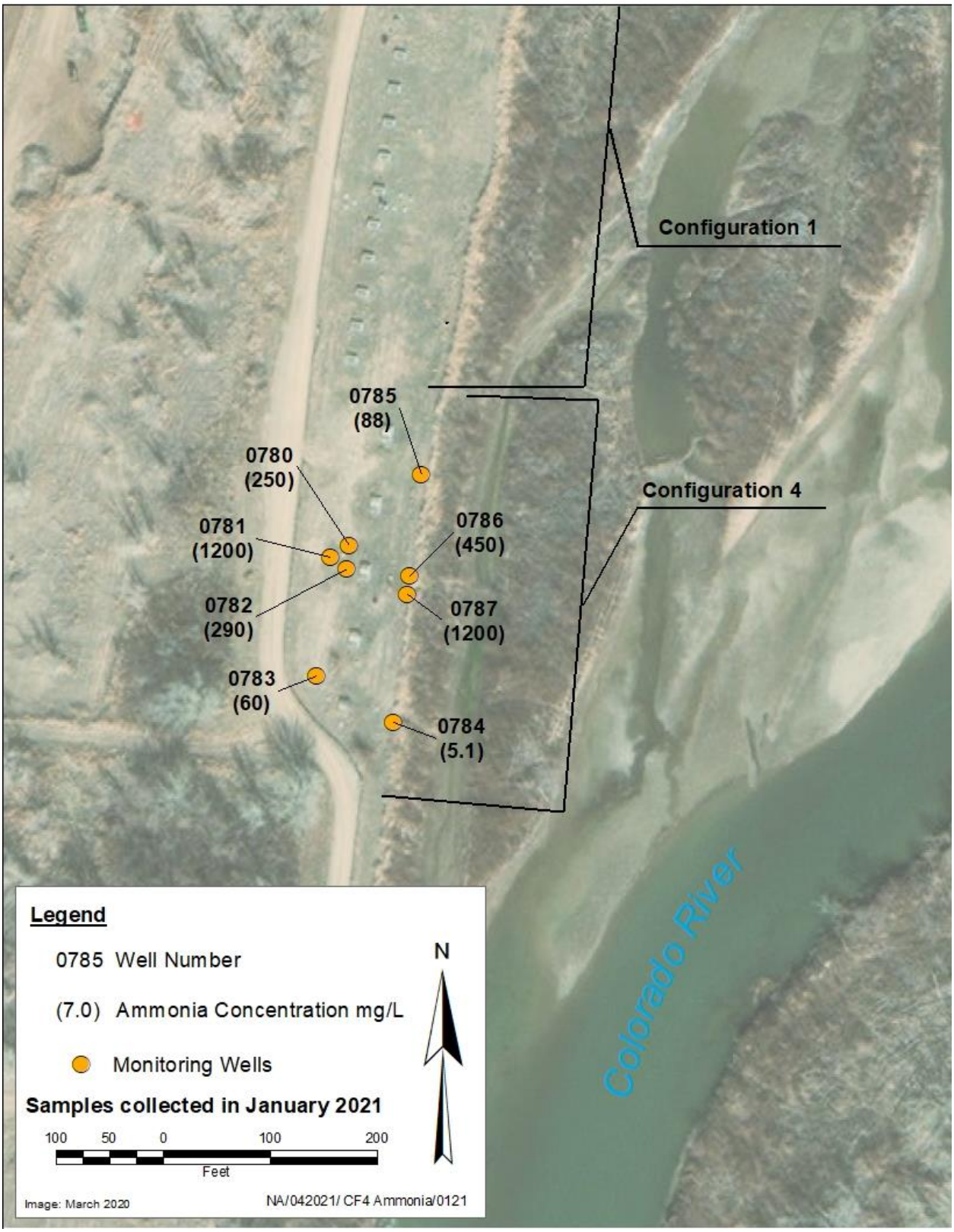

Figure 7. January 2021 CF4 Ammonia Groundwater Concentrations

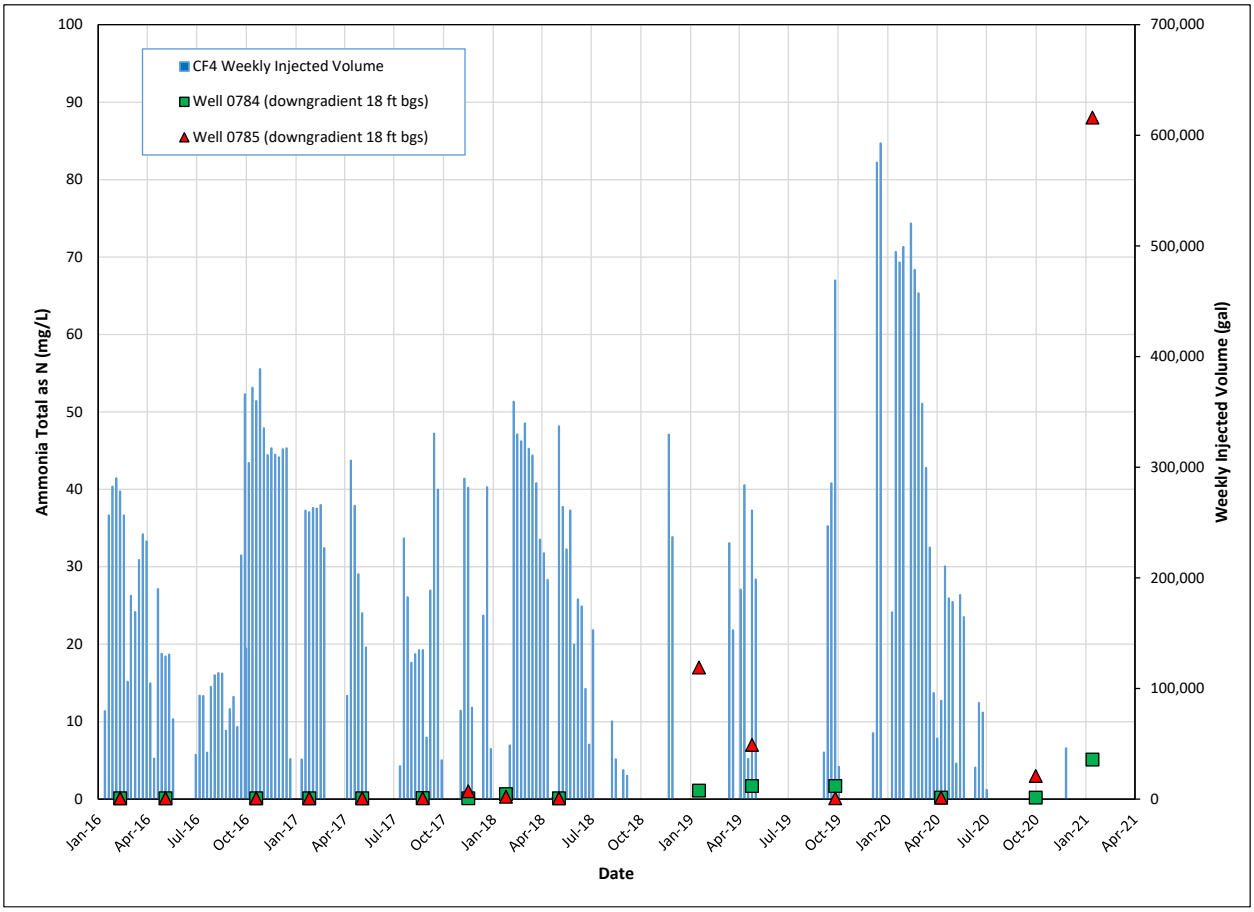

Figure 8. January 2016 through January 2021 CF4 Shallow Zone Ammonia Groundwater Concentrations in Response to Freshwater Injection

CF5 Sampling

Groundwater samples were also collected from the CF5 extraction wells (locations shown on Figure 1) in September 2020. The extraction system had been consistently operational for approximately six months and more than 8.2 mil gal of groundwater had been removed from the groundwater system. CF5 ammonia and uranium concentrations associated with this sampling event are displayed on Figure 9. Time versus concentration plots (Figures 10 through 13) were also generated to display trends of the CF5 extraction wells since June 2010. This nearly covers in entirety the timeframe these wells were actively extracting groundwater (they were brought online starting in April 2010).

Figure 10 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 11 displays a time versus uranium concentration plot for the same set of wells. Figures 12 and 13 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).

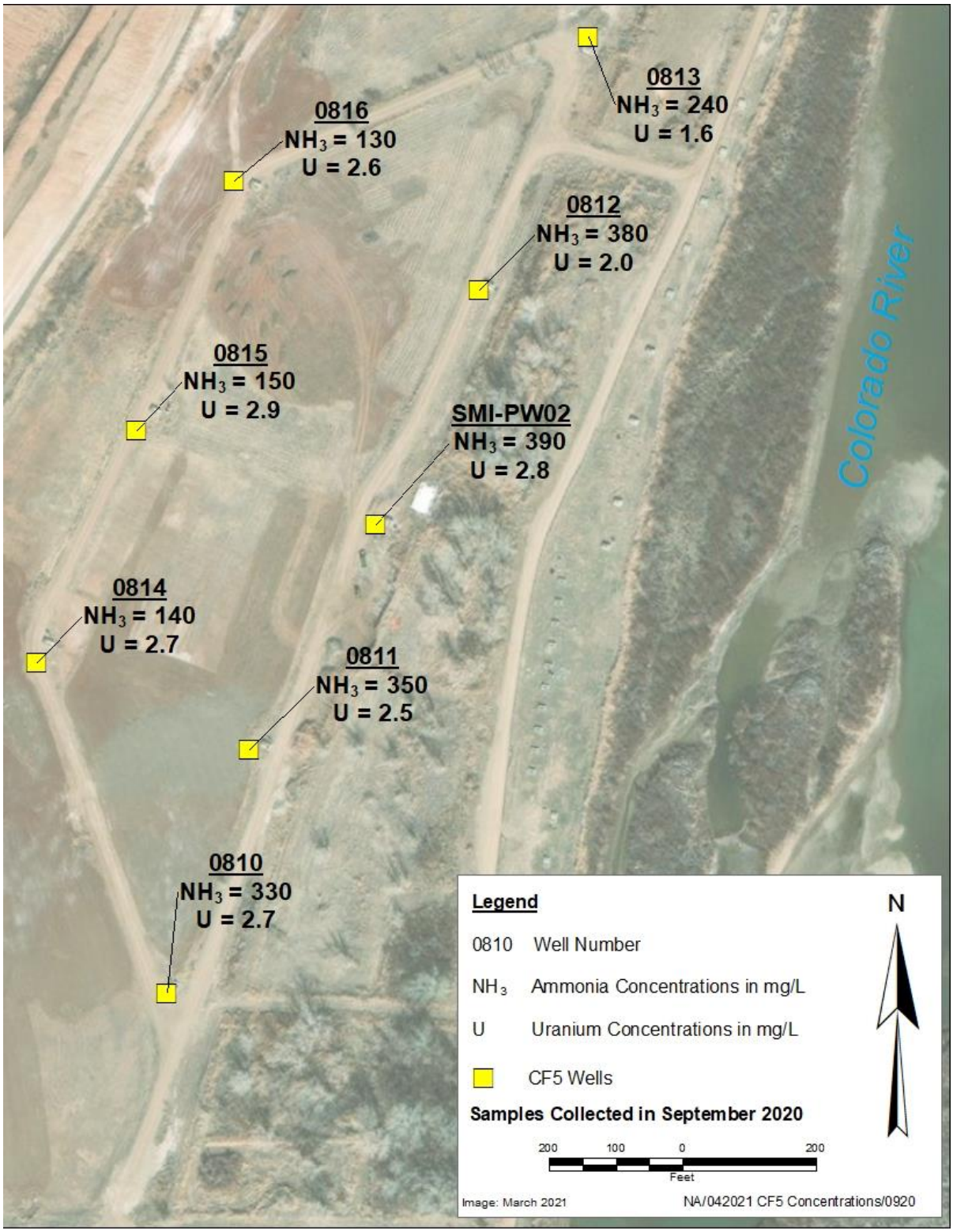

Figure 9. September 2020 CF5 Ammonia and Uranium Groundwater Concentrations

Trend lines applied to data collected since September 2010 from CF5 extraction wells indicate that, with the exception of the samples collected from well 0813, the ammonia concentrations are decreasing at a rate ranging from 3.5 to 20.8 mg/L/yr. Table 15 provides the geometric mean, standard deviation, 95% confidence interval, and the change in ammonia concentration based on the linear trend line for the CF5 extraction wells since 2010.

Table 15. Statistical Data for CF5 Extraction Well Ammonia Data, 2010 through 2020

Ammonia Concentrations (2010 – 2020)	CF5 Extraction Well							
	0810	0811	0812	0813	0814	0815	0816	PW02
Geometric Mean (mg/L)	322.3	406.4	421.5	328.6	189.5	202.4	168.7	460.9
Standard Deviation (mg/L)	31.0	55.2	62.7	91.1	47.3	75.1	28.9	51.4
95% Confidence Interval (mg/L)	14.0	25.5	28.2	40.9	21.9	33.8	13.7	22.5
Change in Concentration (mg/L/yr)	-3.5	-10.8	-3.8	+6.9	-12.1	-20.8	-8.1	-13.1

The trend line associated with data collected from well 0813 indicates concentrations have been increasing over the past 10 years, at a rate of 6.9 mg/L/yr. This increase may be more the result of the historical low concentrations measured after the 2011 flooding event. In addition, well 0813 is located in an area of the well field that remains submerged for an extended period of time after flood events. The concentrations measured after the 2019 flood event displayed a similar significant decrease.

Uranium concentrations in samples collected from wells along the CF5 southeastern boundary all decreased a similar percentage (Figure 10) compared to the previous event, as did the concentrations measured in samples collected from the base of the tailings pile (Figure 12). During this most recent event, the uranium concentrations for all eight CF5 wells ranged from 1.5 to 3.0 mg/L, with the lowest concentrations associated with the wells located in the northeastern section of the well field (wells 0812 and 0813). Over the past four years the samples collected from well SMI-PW02 have had the highest uranium concentration.

Statistical data for the uranium results since 2010 are presented in Table 16. Trend lines applied to the uranium results over the past 10 years for all CF5 wells indicate three wells are decreasing as much as 0.03 mg/L/yr, four wells have displayed an increase of up to 0.06 mg/L/yr, and one well has not changed. The wells associated with the highest increases (wells 0813 and 0816 increased on average 0.06 and 0.03 mg/L/yr, respectively) are located at the northern end of CF5. These minimal increases of the uranium concentrations may be associated with the periodic influx of oxygenated water (during higher river stages) and the corresponding dissolution of solid phase uranium in the subsurface soils.

Table 16. Statistical Data for CF5 Extraction Well Uranium Data, 2010 through 2020

Uranium Concentrations (2010 – 2020)	CF5 Extraction Well							
	0810	0811	0812	0813	0814	0815	0816	PW02
Geometric Mean (mg/L)	3.04	2.65	2.06	1.51	2.83	3.16	2.50	3.23
Standard Deviation (mg/L)	0.49	0.44	0.31	0.43	0.18	0.23	0.17	0.43
95% Confidence Interval (mg/L)	0.22	0.20	0.14	0.19	0.08	0.10	0.08	0.19
Change in Concentration (mg/L/yr)	-0.03	+0.01	0.0	+0.06	+0.01	-0.02	+0.03	-0.01

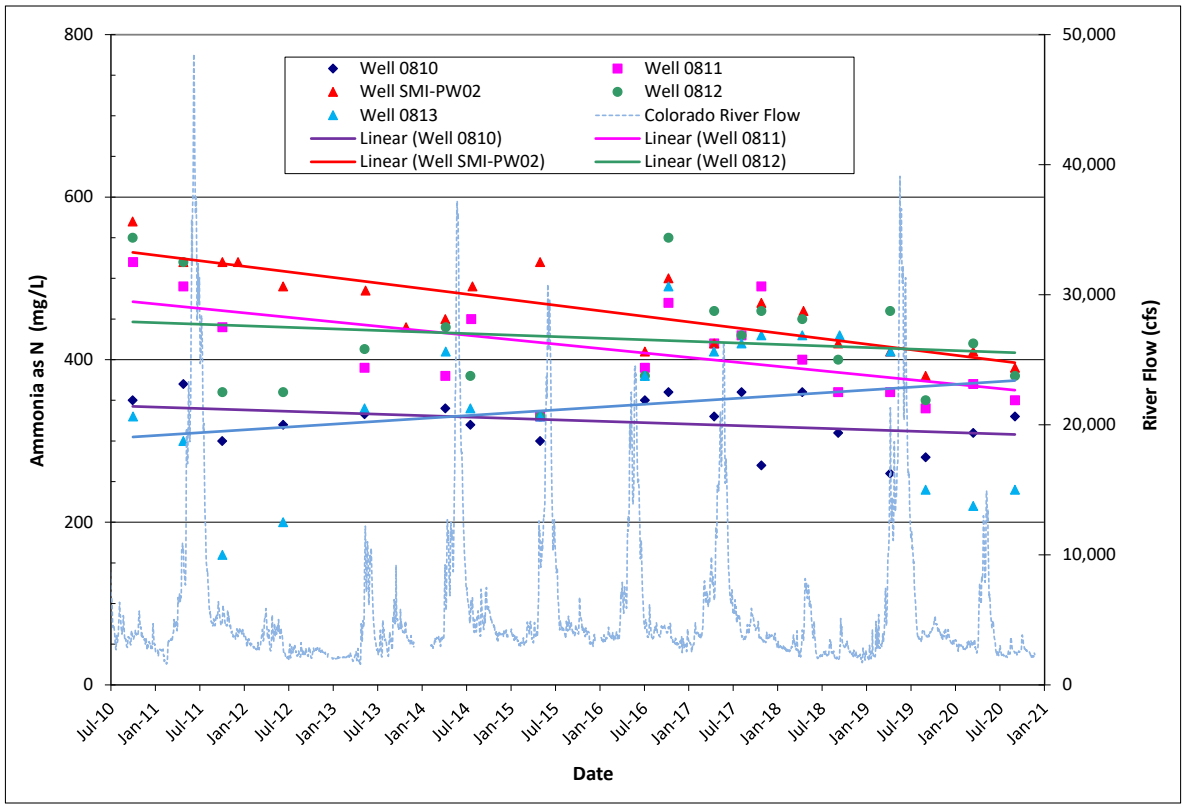

Figure 10. CF5 Extraction Wells 0810, 0811, 0812, 0813, and SMI-PW02 Time versus Ammonia Concentration Plot

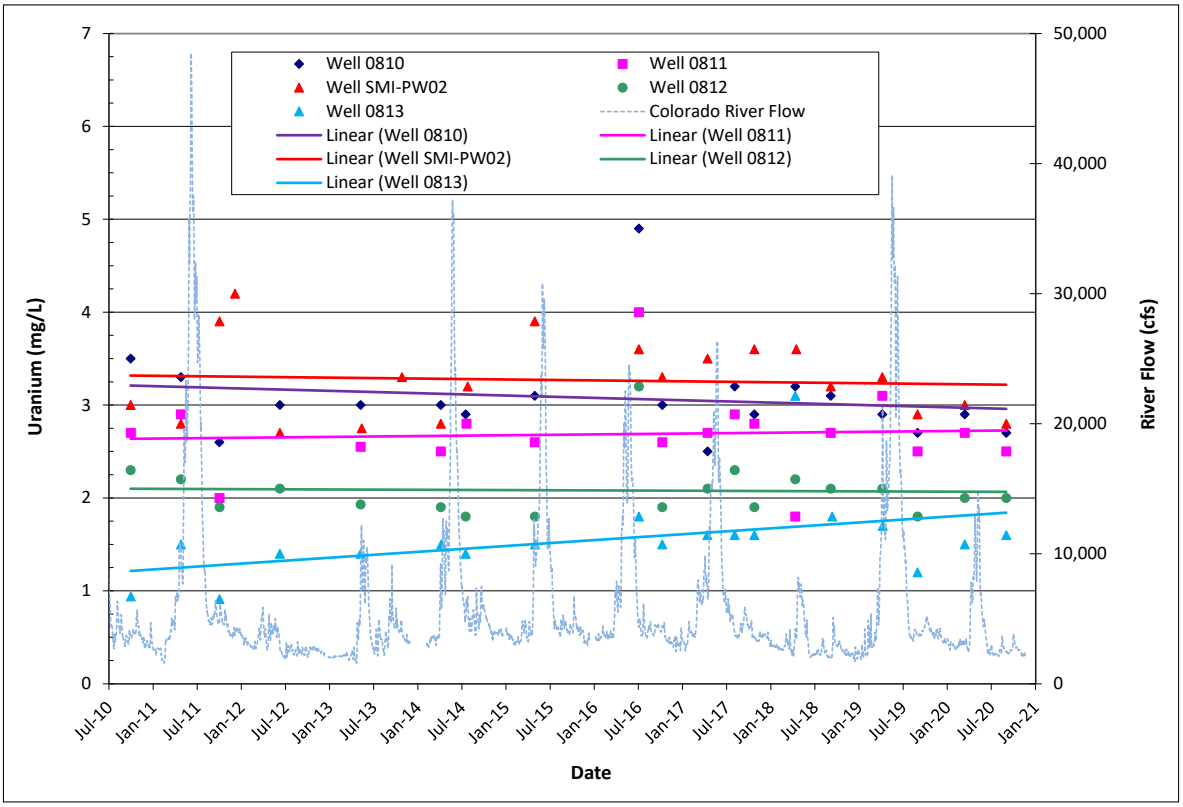

Figure 11. CF5 Extraction Wells 0810, 0811, 0812, 0813, and SMI-PW02 Time versus Uranium Concentration Plot

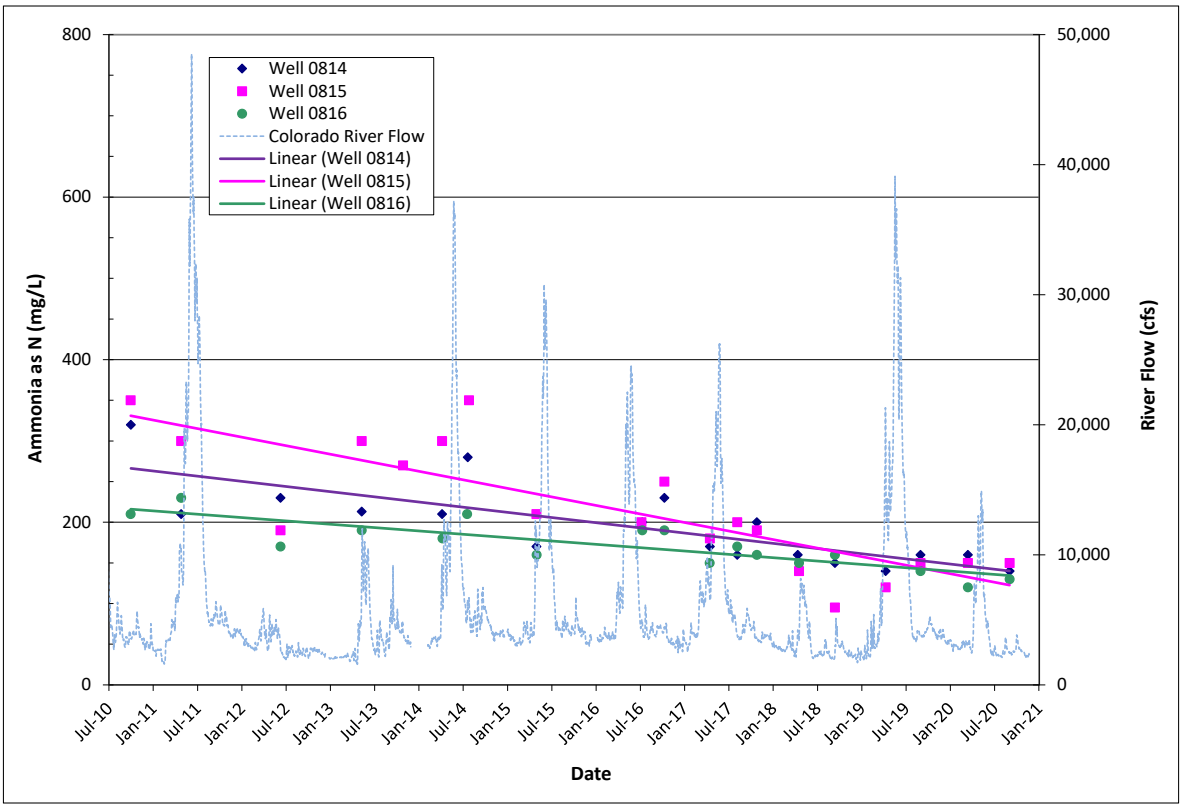

Figure 12. CF5 Extraction Wells 0814, 0815, and 0816 Time versus Ammonia Concentration Plot

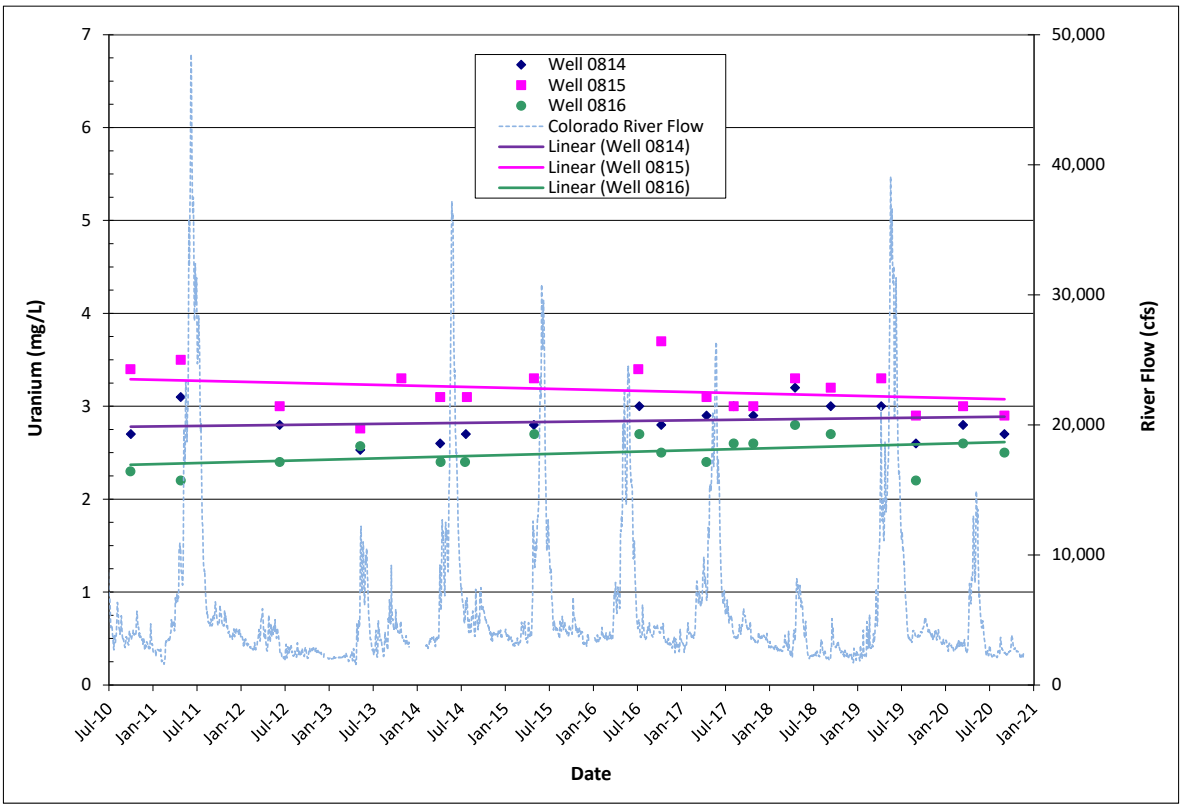

Figure 13. CF5 Extraction Wells 0814, 0815, and 0816 Time versus Uranium Concentration Plot

4.2 December 2020 Crescent Junction Sampling Event Results

The sample from well 0202 (Figure 3) in December represents the third time this location was sampled since a sufficient volume of water for sample collection was first encountered in June 2019. Table 17 provides the analytical results from both the most recent event in addition to the July 2019 and February 2020 sampling events, for comparison purposes. With only three samples, it is difficult to determine any data trends. Taking into account the different detection limits, the December 2020 analyte concentrations are in general similar to the previous results. The one significant exception is the sulfate concentration, which decreased from 28,000 to 19,000 mg/L in February, and remained at 19,000 mg/L in December. All the uranium (both the isotopic and metal form) concentrations were similar for the three samples. Based on this information, the source of the water migrating into well 0202 by December 2020 does not appear to be associated with the tailings placed in the cell, and has not changed since July 2019.

Table 18 displays the analytical results of the December 2020 samples collected from well 0205 (Figure 3), along with the results from the four previous sampling events in June 2018, October 2018, March 2019, and February 2020. These results indicate the well 0205 analyte concentrations of the samples collected from well 0205, with the exception of the uranium-234, nitrate, and TDS have generally not significantly changed.

Based on the most recent results, the uranium-234 concentration increased from 27.9 +/-4.9 to 63.0 +/-11 pCi/L (125%) since the previous event in February 2020, while the U-235 and U-238 concentrations increased 97% and 50%, respectively. Typically increases in groundwater are the result of the Th-234 intermediate nuclide being slightly more mobile in the groundwater phase in the rock matrix. However, a review of the raw lab data did not give any indication of significant differences in the Th-234 concentrations.

The nitrate concentration decreased 45% (from 960 to 530 mg/L) since March 2019, with the December 2020 concentration below the historical minimum. TDS concentrations continue to gradually decrease, from 46,000 to 19,000 mg/L since July 2018. Metal concentrations were all within the historical ranges. These results suggest the water sampled at this location does not appear to be associated with the tailings placed in the disposal cell, and the well continues to be recharged from the same water source.

Table 17. Crescent Junction Well 0202 Analyte Concentrations, July 2019 through December 2020

Analyte	Analyte Concentration on 07/11/19	Analyte Concentration on 02/26/20	Analyte Concentration on 12/8/20
Ammonia as N	14	15	11
Arsenic	0.0039#	0.039#	0.039#
Bicarbonate as $CaCO_3$	1,200	1,100	1,100
Boron	1.5	1.4	1.5
Bromide	12	40#	20#
Cadmium	0.00033#	0.003#	0.0033#
Calcium	410	390	440
Carbonate as $CaCO_3$	50#	20#	20#
Chloride	7,200	6,000	6,900
Chromium	0.0051#	0.005#	0.0051#
Copper	0.0047	0.01#	0.0097#
Fluoride	1#	20#	10#
Iron	0.050#	0.049#	0.049#
Lead	0.0013#	0.013#	0.013#
Magnesium	730	690	810
Manganese	0.44	0.51	0.55
Molybdenum	0.011#	0.011#	0.011#
Nitrate/ Nitrite as N	450	520	500
Potassium	94	73	90
Selenium	0.027#	0.051	0.027#
Sodium	8,900	9,400	10,000
Sulfate	28,000	19,000	19,000
Total Alkalinity as $CaCO_3$	1,200	1,100	1,100
Total Dissolved Solids	24,000	26,000	22,000
Uranium $_{234}$	37.2 +/- 6.6 pCi/L	42.9 +/- 7.3 pCi/L	41.8 +/- 7.3 pCi/L
Uranium $_{235}$	0.49 +/- 0.32 pCi/L	1.17 +/- 0.46 pCi/L	0.95 +/- 0.39 pCi/L
Uranium $_{238}$	8.2 +/- 1.8 pCi/L	10.9 +/- 2.1 pCi/L	9.0 +/- 1.8 pCi/L
Uranium	0.025	0.028	0.029

Notes: All concentrations in mg/L, except where noted, # = Concentration at or below the detection limit

Table 18. Crescent Junction Well 0205 Analyte Concentrations, June 2018 through December 2020

Analyte	Analyte Concentration on 6/27/18	Analyte Concentration on 10/03/18	Analyte Concentration on 03/19/19	Analyte Concentration on 02/26/20	Analyte Concentration on 12/8/20
Ammonia as N	13	22	13	12	15
Arsenic	0.039#	0.0039#	0.039#	0.039#	0.039#
Bicarbonate as $CaCO_3$	1,100	1,100	1,100	960	890
Boron	1.4	1.1	1.4	1.2	1.3
Bromide	40#	20#	20#	40#	20#
Cadmium	0.0033#	0.00033#	0.0033#	0.0033#	0.0033#
Calcium	370	300	330	290	350
Carbonate as $CaCO_3$	20#	100#	20#	20#	20#
Chloride	3,400	3,900	3,500	3,000	4,400
Chromium	0.0051#	0.012	0.0051#	0.0051#	0.0051#
Copper	0.0097#	0.0047	0.0097#	0.0097#	0.0097#
Fluoride	20#	10#	10#	20#	10#
Iron	0.049#	0.026	0.049#	0.049#	0.049#
Lead	0.013#	0.0013#	0.013#	0.013#	0.013#
Magnesium	1,000	1,000	820	710	1,000
Manganese	0.44	0.33	0.36	0.33	0.31
Molybdenum	0.011#	0.013	0.011#	0.011#	0.011#
Nitrate/ Nitrite as N	940	860	960	700	530
Potassium	54	71	47	50	70
Selenium	4.4	4.1	3.1	2.9	2.5
Sodium	10,000	9,700	8,500	8,400	9,700
Sulfate	23,000	24,000	23,000	20,000	23,000
Total Alkalinity as $CaCO_3$	1,100	1,100	1,100	960	890
Total Dissolved Solids	46,000	41,000	39,000	21,000	19,000
Uranium $_{234}$	31.9 +/- 5.7 pCi/L	30.1 +/- 5 pCi/L	30.1 +/- 6 pCi/L	27.9 +/- 4.9 pCi/L	63.0 +/- 11 pCi/L
Uranium $_{235}$	0.64 +/- 0.37 pCi/L	0.56 +/- 0.19 pCi/L	1.45 +/- 0.75 pCi/L	0.59 +/- 0.33 pCi/L	1.16 +/- 0.45 pCi/L
Uranium $_{238}$	11.9 +/- 2.4 pCi/L	9.7 +/- 1.7 pCi/L	12.2 +/- 2.8 pCi/L	9.5 +/- 1.9 pCi/L	14.3 +/- 2.7 pCi/L
Uranium	0.037	0.029	0.025	0.027	0.043

Notes: All concentrations in mg/L, except where noted, # = Concentration at or below the detection limit

4.3 December 2020 through February 2021 Site-wide Sampling Event Results

All samples collected during this event were analyzed for both ammonia and uranium. Select locations were also analyzed for arsenic and selenium. There is no groundwater standard for ammonia; however, Table 19 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 uranium-234 and uranium-238 activities are in equilibrium. Table 19 also includes the locations from the other sampling events from July 2020 through February 2021 that exceeded this concentration. In addition, sample results collected from locations 0410 and 0412 in March 2021 were used to supplement this table.

Table 19. December 2020 through March 2021 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	2/9/2021	CF2	18	1.8
0403	2/9/2021	CF1	18	0.71
0404	2/9/2021	CF3	18	1.8
0406	1/13/2021	CF1	18	0.7
0407	1/19/2021	CF1	18	1.9
0410	3/10/2021	NE Uranium Plume Area	23.5	0.55
0412	3/10/2021	NE Uranium Plume Area	9.5	3.6
0413	1/5/2021	NE Uranium Plume Area	10	2.3
0414	2/9/2021	NE Uranium Plume Area	7.5	2.9
0437	2/24/2021	On Tailings Pile	NA	2.6
0441	2/25/2021	Along SW Site Boundary	53	0.055
0453	2/24/2021	Along SW Site Boundary	80	2.5
0454	12/14/2020	Along SW Site Boundary	13	1.5
0492	2/1/2021	Along S Site Boundary	18	2.2
0780	1/12/2021	CF4	28	2.6
	9/22/2020	CF4	28	2.4
0781	1/12/2021	CF4	48	2.9
	9/22/2020	CF4	48	1.9
0782	1/12/2021	CF4	33	2.8
	9/22/2020	CF4	33	2.7
0783	1/13/2021	CF4	18	1.6
	9/23/2020	CF4	18	0.25
0784	1/11/2021	CF4	18	0.27
0785	1/12/2021	CF4	18	1.5
	9/23/2020	CF4	18	0.47
0786	1/7/2021	CF4	28	3.1
	9/23/2020	CF4	28	2.7
0787	1/7/2021	CF4	36	2.2
	9/23/2020	CF4	36	2.2
0810	9/28/2020	CF5 Extraction Well	10 to 40	2.7
0811	9/28/2020	CF5 Extraction Well	9 to 39	2.5
0812	9/28/2020	CF5 Extraction Well	14 to 44	2.0
0813	9/28/2020	CF5 Extraction Well	14 to 44	1.6
0814	9/28/2020	CF5 Extraction Well	12 to 42	2.7
0815	9/28/2020	CF5 Extraction Well	22 to 52	2.9
0816	9/28/2020	CF5 Extraction Well	21 to 51	2.5
AMM-2	12/14/2020	Near CF5	48	2.0
AMM-3	12/14/2020	Base of Tailings Pile	48	1.7

Table 19. December 2020 through March 2021 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)
MW-3	1/5/2021	Near CF5	44	2.7
SMI-MW01	2/9/2021	NE Uranium Plume Area	16	2.5
SMI-PW01	12/15/2020	CF5 Vicinity	40	1.3
SMI-PW02	9/28/2020	CF5 Extraction Well	20 to 60	2.8
SMI-PW03	2/11/2021	NE Uranium Plume Area	40	0.36
SMI-PZ1D2	12/15/2020	CF5 Vicinity	73	1.3
SMI-PZ1M	12/15/2020	CF5 Vicinity	57	3
SMI-PZ1S	12/15/2020	CF5 Vicinity	18	1.2
SMI-PZ2M2	12/14/2020	CF5 Vicinity	56	2.7
SMI-PZ3D2	2/11/2021	NE Uranium Plume Area	78	0.86
SMI-PZ3M	2/11/2021	NE Uranium Plume Area	59	0.31
SMI-PZ3S	2/11/2021	NE Uranium Plume Area	25	0.8
TP-01	12/16/2020	NE Uranium Plume Area	22	0.046
TP-22	12/15/2020	NE Uranium Plume Area	17	0.39
TP-23	12/14/2020	NE Uranium Plume Area	25	2.3
UPD-17	2/11/2021	NE Uranium Plume Area	14	1.5
UPD-18	2/11/2021	NE Uranium Plume Area	13	0.92
UPD-20	2/24/2021	NE Uranium Plume Area	17	0.071
UPD-21	2/24/2021	NE Uranium Plume Area	25	6
UPD-22	1/5/2021	NE Uranium Plume Area	9	2.5
UPD-23	1/20/2021	NE Uranium Plume Area	26	0.85
UPD-24	2/11/2021	NE Uranium Plume Area	27	4.6

Notes: NE = northeastern; SW = southwestern

Tables 20 and 21 provide the locations that exceeded the EPA National Primary Drinking Water Standards for arsenic and selenium, respectively. Of the 20 select locations (based on historical results) in which arsenic was analyzed, seven exceeded the 0.01 mg/L standard.

Table 20. December 2020 through March 2021 Groundwater Locations Exceeding the Arsenic 0.01 mg/L EPA National Primary Drinking Water Standard

Well Number	Date	Location	Sample Depth (ft bgs)	Arsenic Concentration (mg/L)
0412	3/10/2021	NE Uranium Plume Area	9.5	0.013
0413	1/5/2021	NE Uranium Plume Area	10	0.041
0414	2/9/2021	NE Uranium Plume Area	7.5	0.016
SMI-PZ3S	2/11/2021	NE Uranium Plume Area	25	0.021
UPD-17	2/11/2021	NE Uranium Plume Area	14	0.017
UPD-18	2/11/2021	NE Uranium Plume Area	13	0.018
UPD-24	2/11/2021	NE Uranium Plume Area	27	0.23

The groundwater system underlying the site is not a drinking water source, and arsenic was analyzed for informational purposes only. These same locations will be sampled again during the subsequent sampling event as a best management practice to determine if they remain above the standard. Nine of the 22 select (based on historical results) locations had selenium concentrations above the 0.05 mg/L standard. The results presented in Table 21 represent the second time selenium has been analyzed in samples from these locations since 2011. This analysis was also completed as a best management practice as the groundwater is not considered a drinking water source.

Table 21. December 2020 through February 2021 Groundwater Locations Exceeding the Selenium 0.05 mg/L EPA National Primary Drinking Water Standard

Well Number	Date	Location	Sample Depth (ft bgs)	Selenium Concentration (mg/L)
0413	1/5/2021	NE Uranium Plume Area	10	0.092
0437	2/24/2021	On Tailings Pile	NA	0.086
0440	2/24/2021	Along NW Site Boundary	117	0.067
0453	2/24/2021	Along SW Site Boundary	80	0.29
UPD-17	2/11/2021	NE Uranium Plume Area	14	0.11
UPD-18	2/11/2021	NE Uranium Plume Area	13	0.075
UPD-21	2/24/2021	NE Uranium Plume Area	25	0.14
UPD-23	1/20/2021	NE Uranium Plume Area	26	0.068
UPD-24	2/11/2021	NE Uranium Plume Area	27	0.071

To more easily present the trends observed in the water chemistry for the site-wide locations, the site was divided into six areas. These include:

- The Northeastern Base of the Tailings Pile
- The Northeastern Uranium Plume
- The Southeastern Base of the Tailings Pile
- The Southwestern Site Boundary
- The Site Boundary along the Colorado River
- The Southern and Off-site Areas

Also included are plots for the SMI-PW01, SMI-PW03, and the ATP-1 clusters, as well as the response to CF5 extraction system activity on nearby monitoring wells SMI-PZ2M2 and AMM-2. All results since 2010 are plotted against the Colorado River flow to determine if the river stage may impact the concentrations. Refer to Figure 5 for the site-wide sampling locations.

4.3.1 Northeastern Base of Tailings Pile

Figures 14 and 15 are time versus ammonia and uranium concentration plots, respectively, for locations UPD-17 and UPD-18. Because of these location's 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). This trend continues, as displayed in Figure 14. As opposed to rebounding after the below average 2020 spring runoff, the samples collected in February 2021 showed that the ammonia concentrations in UPD-17 continued to decrease, while the UPD-18 ammonia concentrations remained consistent.

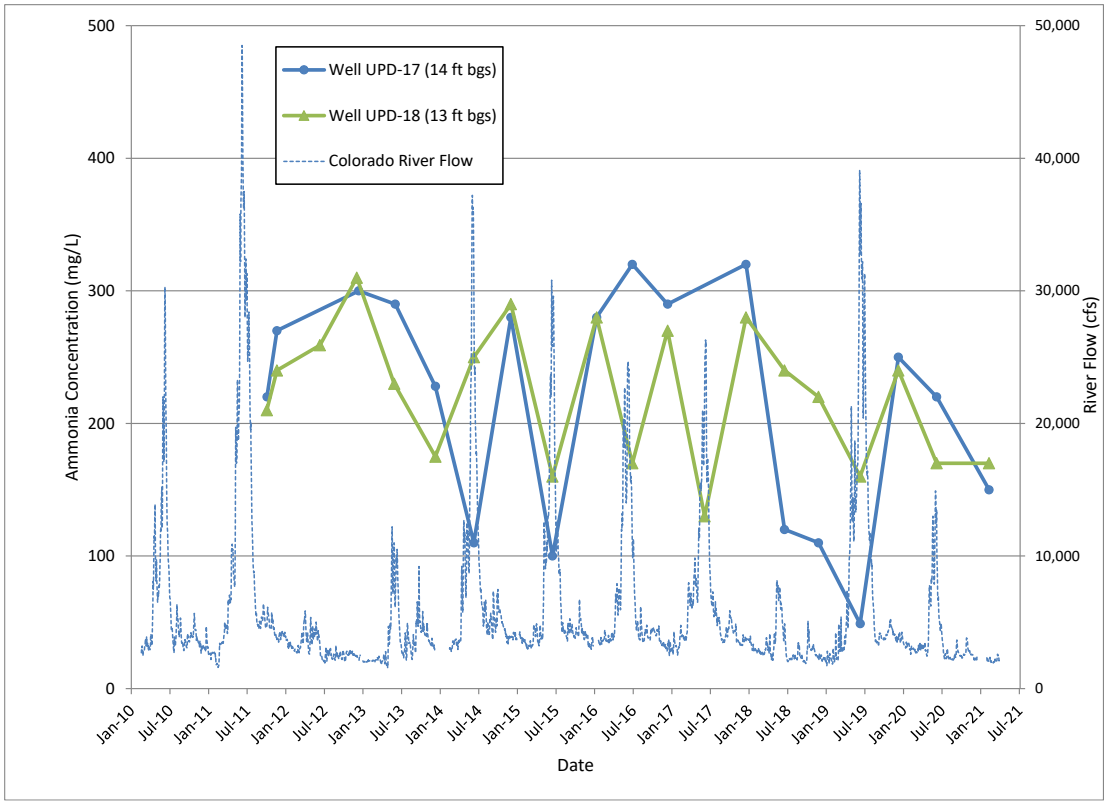

Figure 14. Wells UPD-17 and UPD-18 Time versus Ammonia Concentration Plot

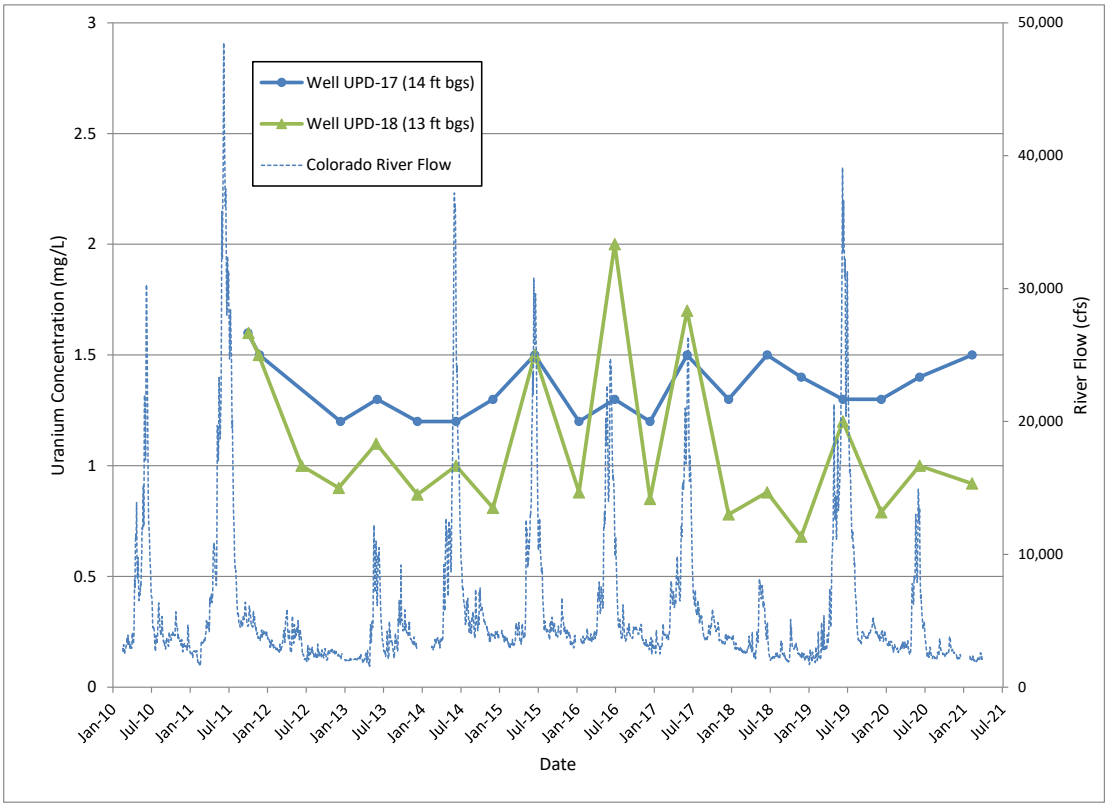

Figure 15. Wells UPD-17 and UPD-18 Time versus Uranium Concentration Plot

Uranium concentrations (Figure 15) tend to increase during higher river stages, where oxygenated water enters the subsurface and increases the uranium solubility. This geochemical reaction is especially evident in the samples collected from well UPD-18. By February 2021 the uranium concentrations in UPD-17 continued to increase after the 2020 runoff, and the UPD-18 concentrations started to decrease.

4.3.2 Northeastern Uranium Plume

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.

Center of Northeastern Uranium Plume Area

Figures 16 and 17 are the time versus ammonia and uranium concentration plots, respectively, for the center of the northeastern uranium plume area, which includes locations UPD-20, 0411, 0413, and 0414 (listed from upgradient to downgradient).

As displayed in Figure 16, the ammonia concentrations continue to remain below the detection limit in the samples collected from well UPD-20, which is the furthest upgradient location and outside of the ammonia plume. Well 0413 is approximately 650 ft from the Colorado River, and the ammonia concentrations collected from this location are have been consistently higher since 2011 compared to the samples collected from well 0414. Well 0413 is less susceptible to impacts of the river stage compared to well 0414 (located only 250 ft from the river) when this area is not flooded. Concentrations of samples collected from these two locations were also within the historical range during this most recent event.

The uranium concentration (Figure 17) in the sample collected from well UPD-20 was again just above the 0.044 mg/L standard (as it has been since this well was installed in 2011), with a concentration of 0.071 mg/L. Since 2012 the concentration has ranged from 0.056 to 0.095 mg/L. The uranium concentrations in samples collected from wells 0413 and 0414 have generally been similar since June 2013, with 0414 concentrations on average only 0.2 mg/L higher than 0413. By the most recent event, the uranium concentrations in the samples collected from both wells decreased after increasing in response to the 2020 below average peak flows. This response again suggests the impact of oxygenated water on uranium solubility.

Vicinity of the Atlas Building

The ammonia and uranium concentrations associated with samples collected from locations in the vicinity of the Atlas building are displayed in Figures 18 and 19, respectively. These wells include 0410, UPD-21, UPD-23, and UPD-24, all of which were sampled at a depth of approximately 25 ft bgs.

As shown in Figure 18, the ammonia concentrations in these samples collected during this site-wide event were all less than 5 mg/L. Analytical results indicate that the concentration in the sample from well 0410 during the most recent event remained below 1 mg/L, suggesting the plume has not migrated to the northeast in this area of the site since 2009. Ammonia concentrations in the samples collected from UPD-23 and -24 have remained within historical ranges based on the most recent event.

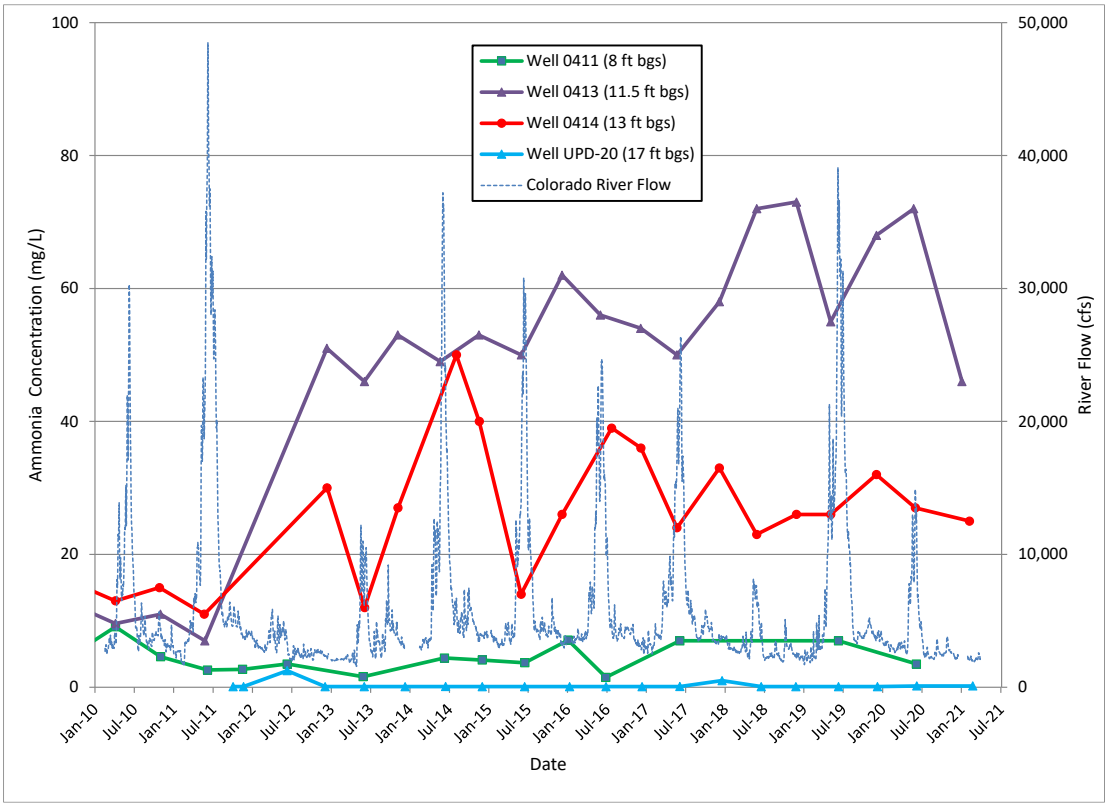

Figure 16. Center of Northeastern Uranium Plume Area Observation Wells 0411, 0413, 0414, and UPD-20 Time versus Ammonia Concentration Plot

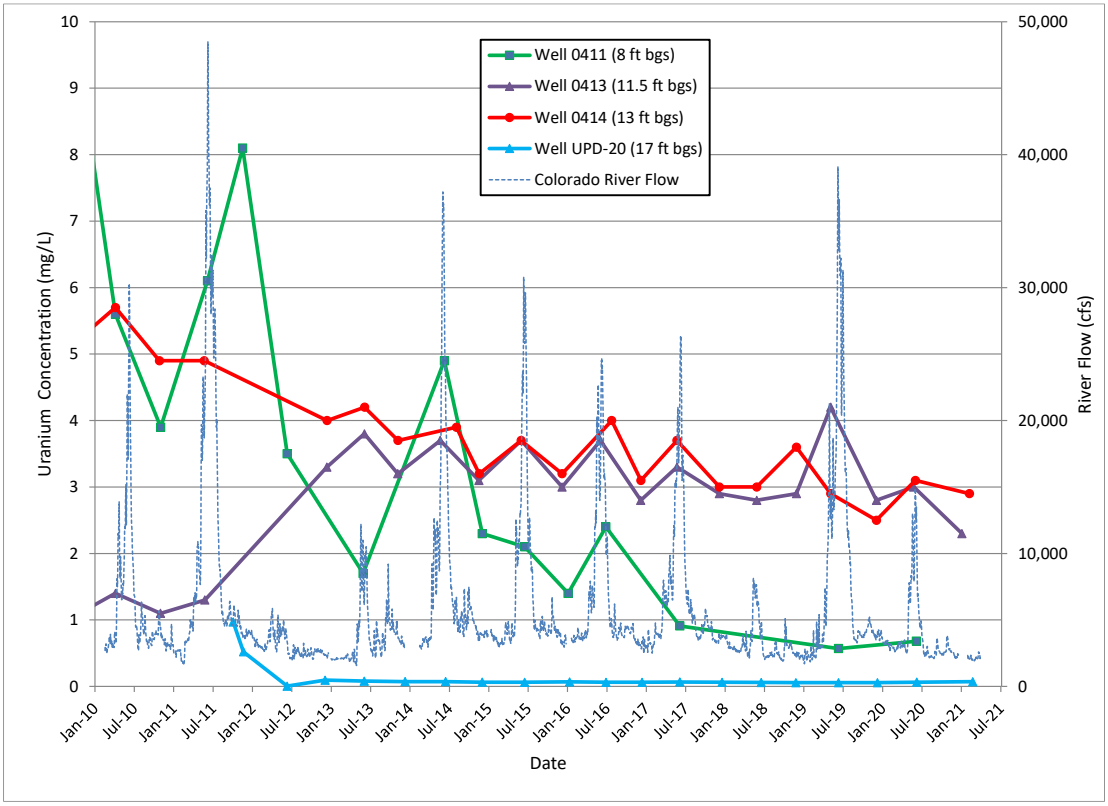

Figure 17. Center of Northeastern Uranium Plume Area Observation Wells 0411, 0413, 0414, and UPD-20 Time versus Uranium Concentration Plot

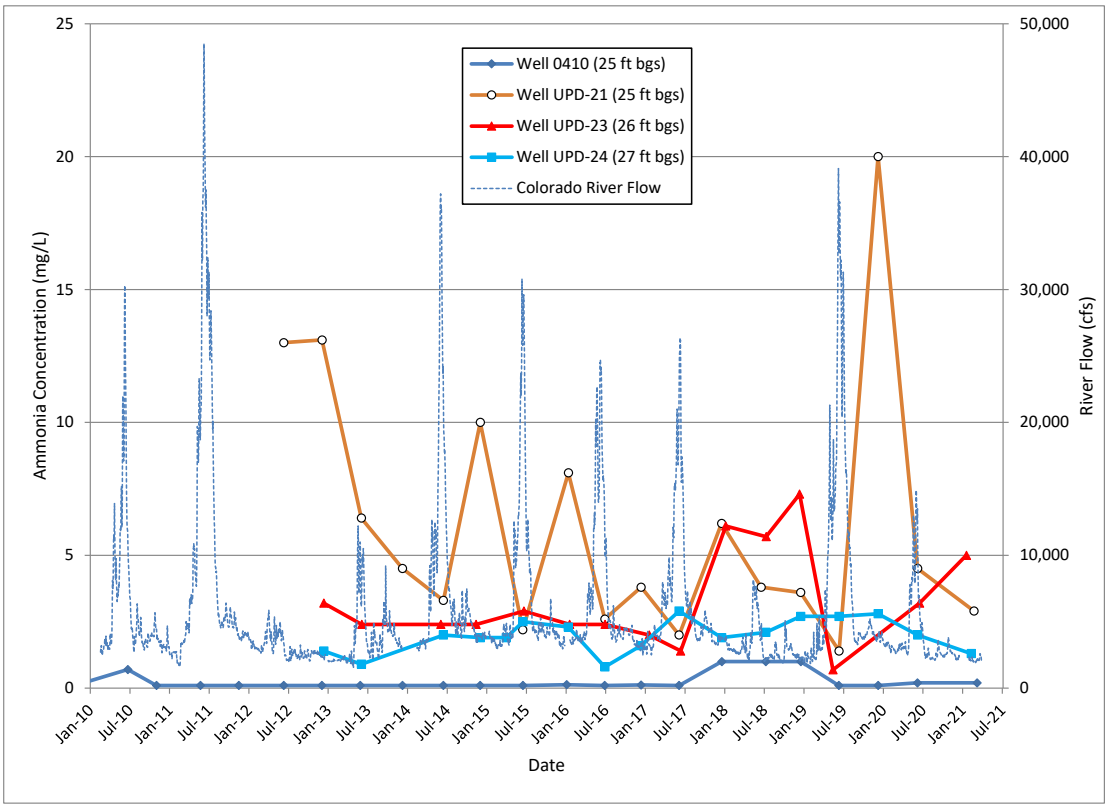

Figure 18. Vicinity of Atlas Building Observation Wells 0410, UPD-21, UPD-23, and UPD-24 Time versus Ammonia Concentration Plot

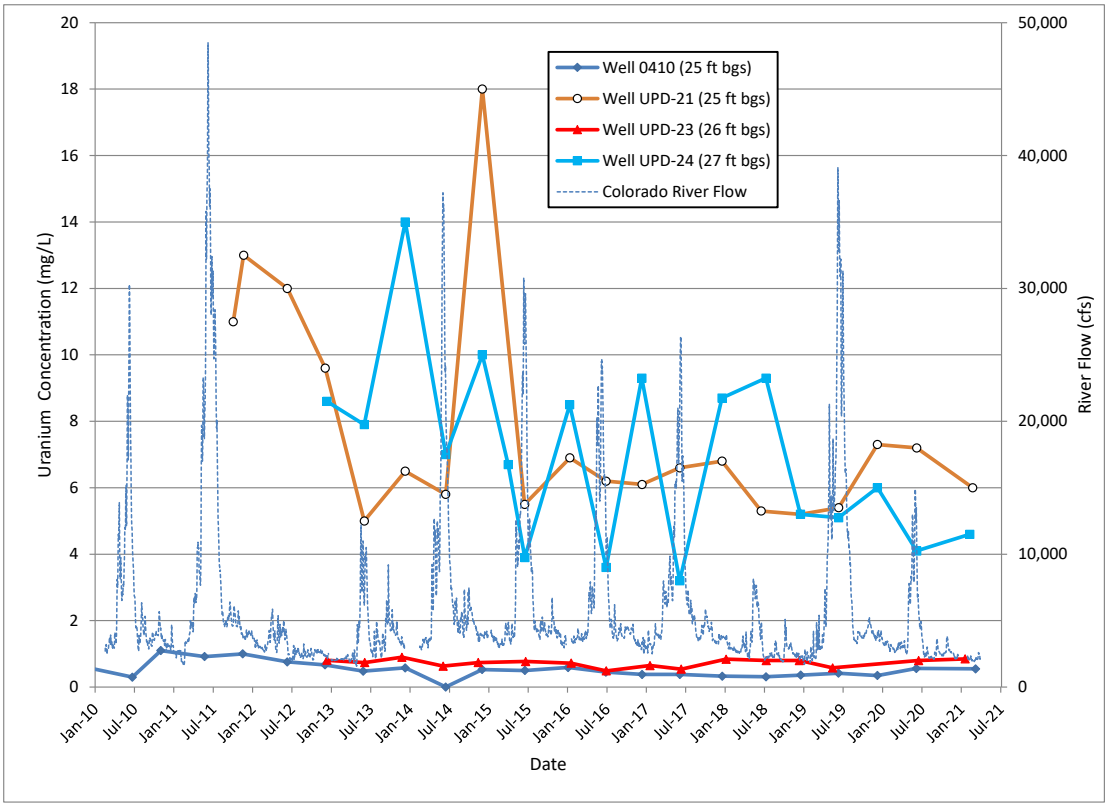

Figure 19. Vicinity of Atlas Building Observation Wells 0410, UPD-21, UPD-23, and UPD-24 Time versus Uranium Concentration Plot

Historically this area of the site has had the highest uranium concentrations (Figure 19) in groundwater, particularly in wells UPD-21 and -24. The uranium concentrations in samples collected from wells 0410 and UPD-23 remain lower than 1.0 mg/L and have not significantly changed since 2012, suggesting the uranium plume has not extended to the north/northeast during this time. Figure 19 suggests that the UPD-24 concentrations seasonally fluctuate, decreasing during high river stage and increasing during base flow conditions. This variability is in contrast to that displayed by other locations, and may suggest different geochemical processes are taking place in this portion of the groundwater system.

UPD-21 concentrations reached a site-wide maximum uranium concentration of 18 mg/L in 2014. Since that time, the concentrations have remained consistent, ranging from 5.2 to 7.3 mg/L.

Northeastern Edge of Uranium Plume Area

Figures 20 and 21 display ammonia and uranium concentration data for the wells located in the vicinity of the northeastern edge of the plume area. This includes wells SMI-PZ3S, UPD-22, 0412 and SMI-MW01 (listed from upgradient to downgradient). Well SMI-PZ3S is located approximately 850 ft from the river bank, and SMI-MW01 is only 50 ft off the bank. Well 0412 is near SMI-MW01, approximately 60 ft upgradient, but sampled at different depths (11 and 16 ft bgs, respectively).

As Figure 20 exhibits, the ammonia concentrations associated with the sampling of these wells increases moving away from the river bank. The fluctuations displayed in the concentrations associated with 0412 are a function of detection limits. The concentrations measured in the samples collected from SMI-MW01, 0412, and SMI-PZ3S have remained low (below 4 mg/L since 2016), suggesting this area is close to the edge of the ammonia plume. Through 2015 the concentrations measured in samples collected from well UPD-22 were below 5 mg/L, increased to nearly 10 mg/L in 2017 suggesting some minimal plume movement since 2016.

With this set of wells located downgradient of the Atlas Building and former processing area (Section 4.3.4), the uranium concentrations are impacted by the upgradient conditions. However, consistently the uranium concentrations measured in the samples collected from the well closest to the Atlas Building cluster (SMI-PZ3S) are the lowest of this set of wells. Additionally well SMI-PZ3S is near UPD-24, approximately 200 ft downgradient, but the concentrations are significantly different (0.8 and 4.6 mg/L, respectively) during this most recent event even though the sample depths are similar (25 and 27 ft bgs). As shown in Figure 21, moving in the southeast (downgradient) direction concentrations generally increase, with the highest associated with the sample collected from well 0412. The concentration increase in the downgradient direction suggests the uranium plume is being impacted by another source, possibly the remnants of the berm that was in place during mill site operations through 2011.

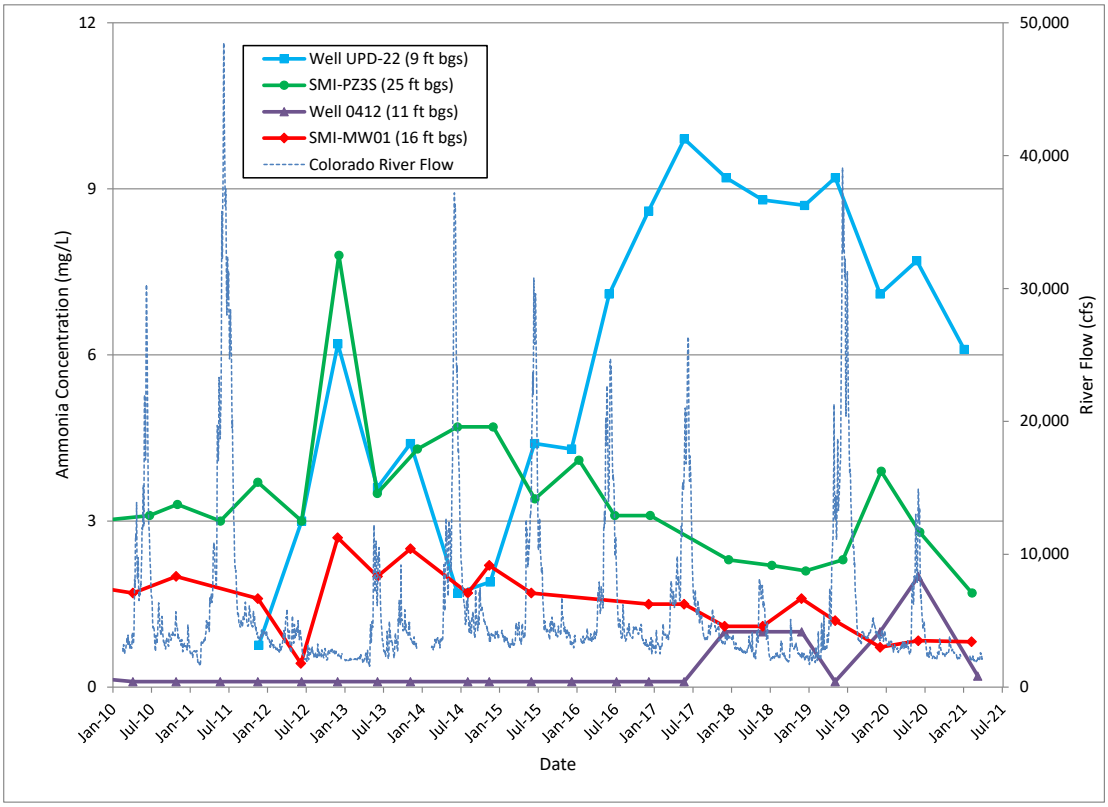

Figure 20. Northeastern Edge of Uranium Plume Area Observation Wells 0412, SMI-MW01, SMI-PZ3S, and UPD-22 Time versus Ammonia Concentration Plot

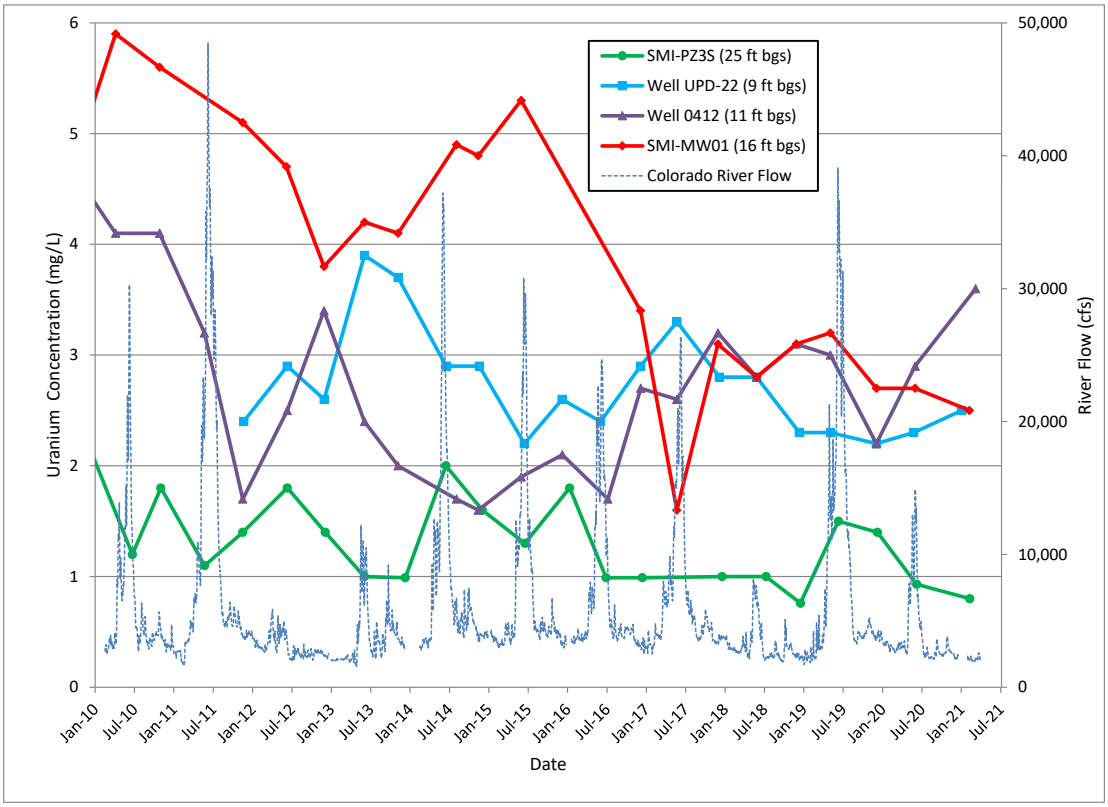

Figure 21. Northeastern Edge of Uranium Plume Area Observation Wells 0412, SMI-MW01, SMI-PZ3S, and UPD-22 Time versus Uranium Concentration Plot

4.3.3 Southeastern 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 22 and 23 for wells 0454, AMM-3, ATP-2-S, ATP-2-D, and MW-3 (listed from south to north). As displayed in the legend on Figure 21, these wells are sampled over a variety of depths, ranging from 13 to 88 ft bgs. They are also located at approximately the same ground surface elevation.

Starting from the southern corner of the base of the pile, the samples collected 13 ft bgs from well 0454 provide ammonia concentrations in the shallowest zone. Figure 22 displays how this zone of the plume is impacted by the river stage, with a significant decrease when the river is experiencing spring runoff flows. Because this well is located in a slight depression off the southern tip of the pile, it is susceptible to being submerged during flood events (most recently in 2019). Between July 2017 and January 2019 ammonia concentrations were comparable to those in samples collected from other wells along the tailings pile base, approximately 400 mg/L. The concentration decreased to 55 mg/L during the 2019 flood, and has continued to rebound and, based on the recent event, is comparable to the concentrations measured in wells AMM-3 and MW-3.

Wells ATP-2-S and ATP-2-D are contained within a well cluster that is located near the center of the tailings pile base. Since 2010 ammonia concentrations have been similar from depths of 25 and 88 ft bgs. This not only provides a general idea of the depth of the plume, but also suggests there is minimal impact from the river stage on the ammonia plume down to a depth of at least 25 ft bgs. However, starting with the June 2020 sampling event, the ATP-2-S ammonia concentration decreased significantly and remained low during the most recent event. During this same time frame the ATP-2-D concentration remained within the historical range, suggesting this portion of the plume was diluted while the deeper zone was not impacted. Well MW-3 is located near the northeastern end of the plume, and ammonia concentrations in samples collected at this location are similar and tend to mimic those associated with the ATP-2-D.

Well 0454 displays the impact of the river stage on the uranium concentration in the shallowest zone (Figure 23), where uranium concentrations tend to decrease in response to high river flows. The samples collected from well MW-3 have had the highest uranium concentration of this group of wells consistently since 2011, while concentrations in wells ATP-2-S and ATP-2-D have all been less than 0.015 mg/L since 2010. One would expect the ATP well concentrations to be higher, especially in the sample associated with ATP-2-S (from 25 ft bgs), since the samples collected along the base of the tailings between 13 (0454) and 44 ft bgs (MW-3) range from 1.5 to 2.7 mg/L.

4.3.4 Southwestern Site Boundary

Figures 24 and 25 are time versus concentration plots for ammonia and uranium, respectively, for locations 0441, 0440, 0453, and 0454 (listed from northwest to southeast). These locations are all along the furthest western extent of the alluvial aquifer. Due to the varying topography along this boundary, sample depths range from 13 to 117 ft bgs. The results associated with well 0454 are again presented in this section because in addition to being located along the base of the tailings pile, it is also along this site boundary.

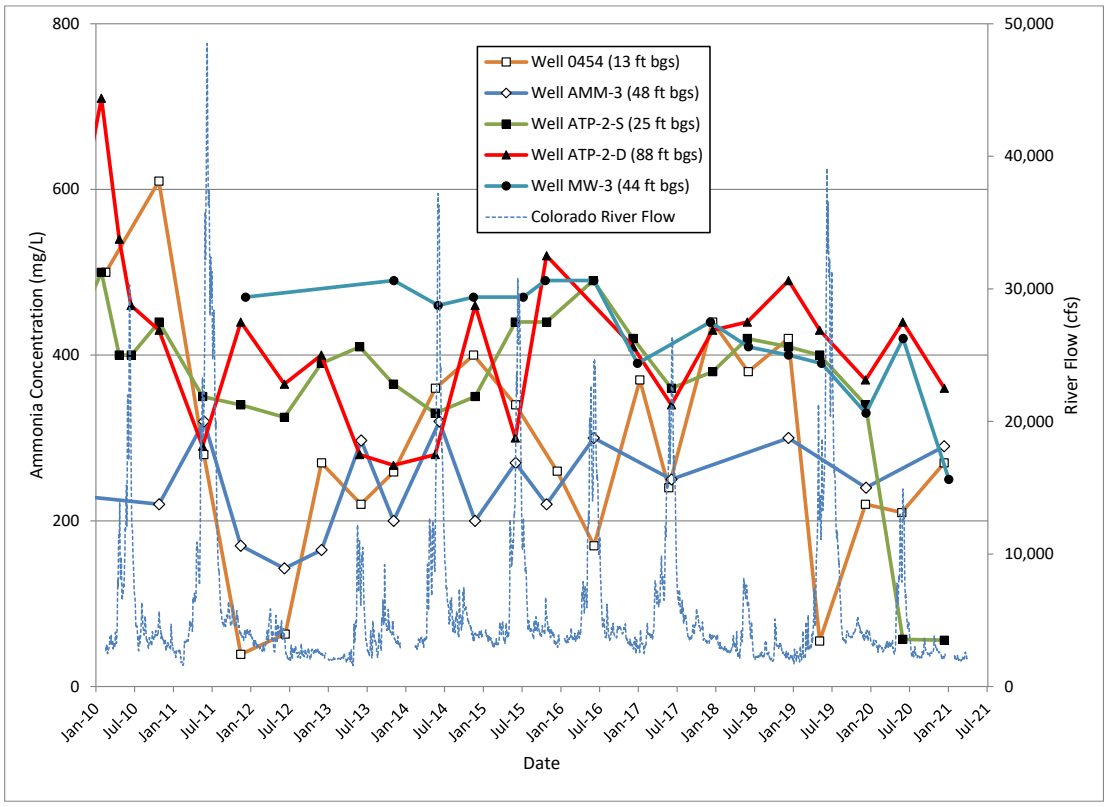

Figure 22. Base of Tailings Pile Observation Wells 0454, AMM-3, ATP-2-S, ATP-2-D, and MW-3 Time versus Ammonia Concentration Plot

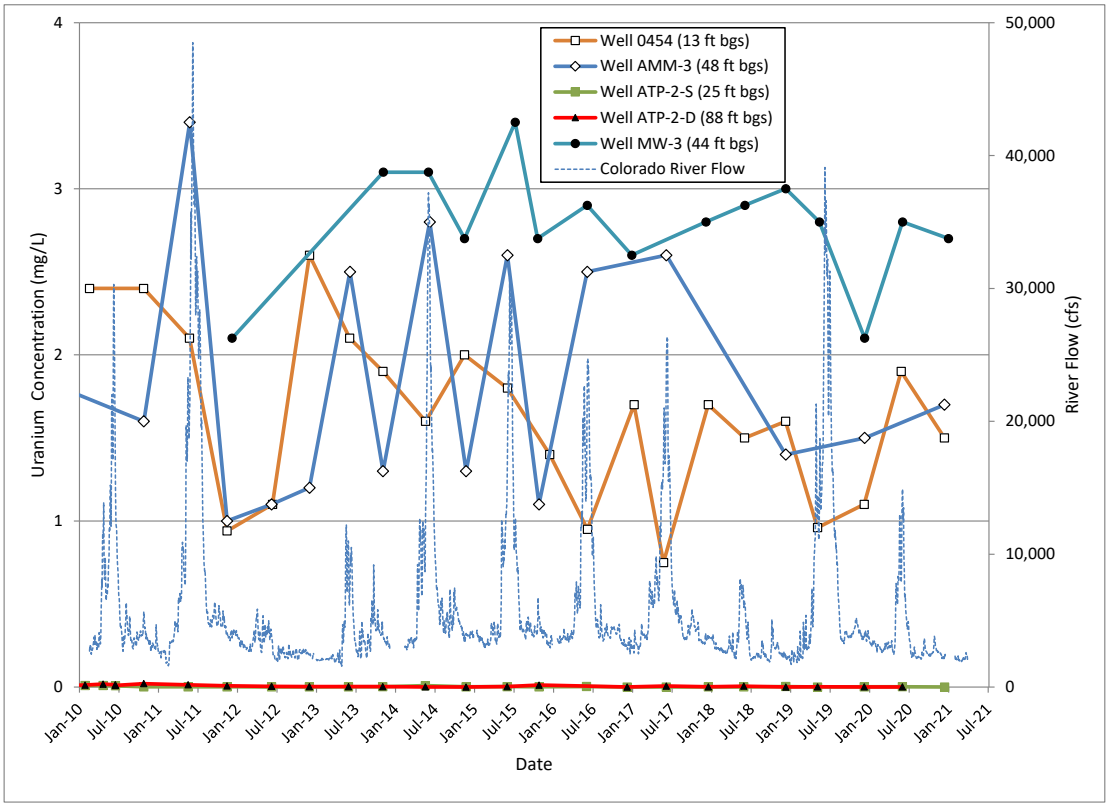

Figure 23. Base of Tailings Pile Observation Wells 0454, AMM-3, ATP-2-S, ATP-2-D, and MW-3 Time versus Uranium Concentration Plot

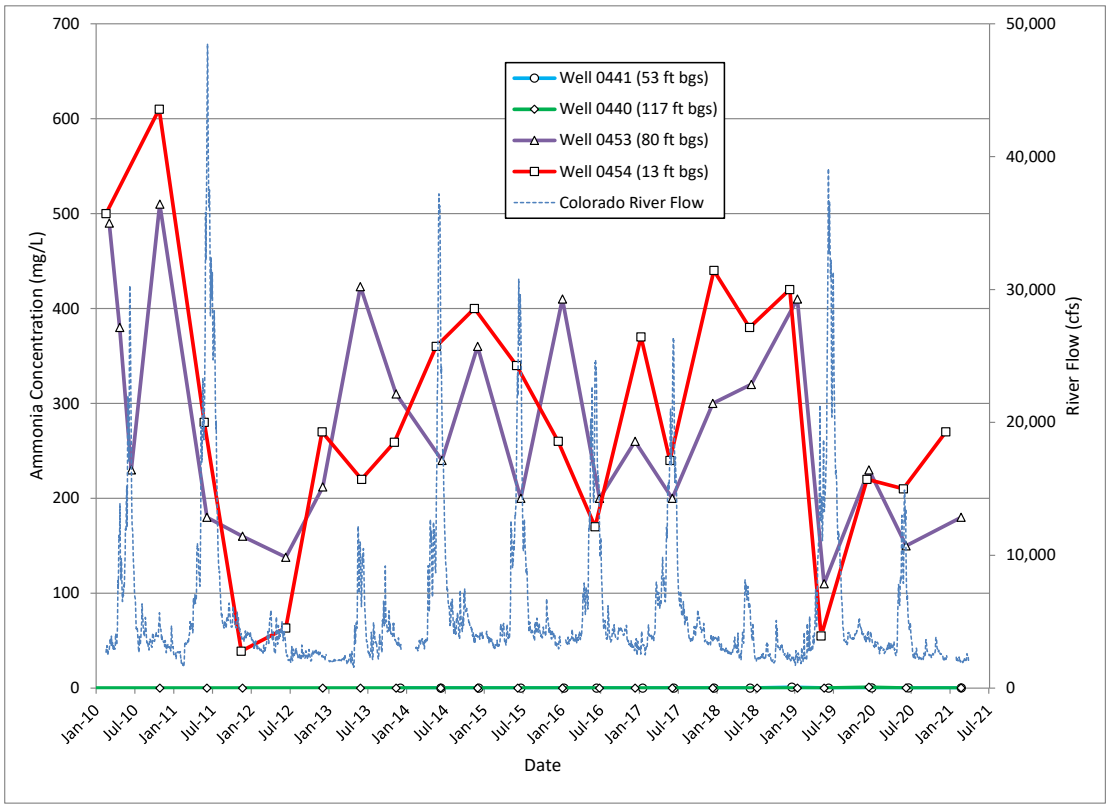

Figure 24. Southwestern Boundary Observation Wells 0453, 0454, and 0440 Time versus Ammonia Concentration Plot

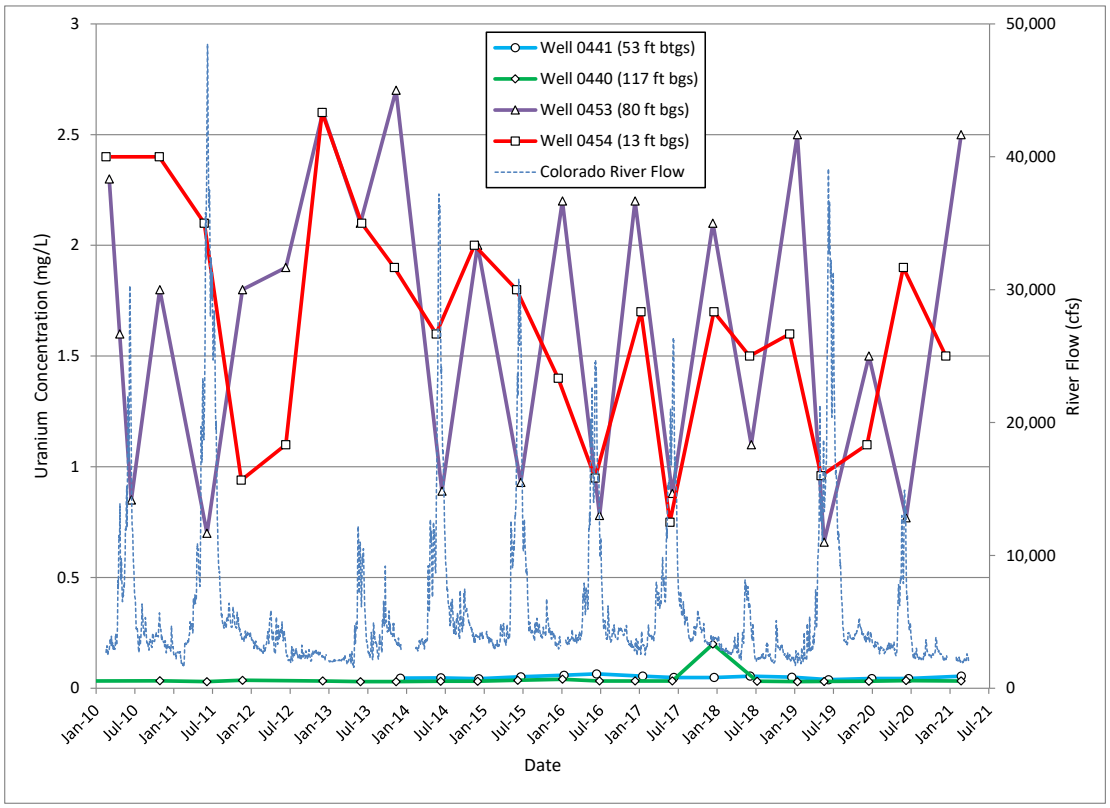

Figure 25. Southwestern Boundary Observation Wells 0453, 0454, and 0440 Time versus Uranium Concentration Plot

Both wells 0441 and 0440 are located upgradient of the ammonia plume, and there has been no evidence of plume migration since these wells were installed (2002 and 2010, respectively). Ammonia concentrations and fluctuations are similar in the samples collected from 0453 and 0454 (Figure 24). The river stage data plotted with the concentrations suggests the river stage impacts 0454 concentrations despite well 0453 being located more than 2,400 ft from the river and 0454 is approximately 1,100 ft away.

Wells 0453 and 0454 uranium concentrations (Figure 25) display significant seasonal fluctuations similar to those displayed by ammonia concentrations, with lower concentrations during the peak river flows and increased concentrations during river base flows. The sample collected from well 0440 (0.033 mg/L) is below the 0.044 mg/L uranium UMTRA standard, and the 0441 concentration measured from the sample collected during this most recent event is above the standard (0.055 mg/L). These data suggests there has been minimal change in the northwest corner of the plume.

4.3.5 Site Boundary along the Colorado River

Figures 26 and 27 are the time versus ammonia and uranium concentration plots, respectively, for the locations sampled along the riverbank. Wells TP-17, 0492, 0407, 0401, 0404, SMI-MW01, and TP-01 (listed from the south to the north) were sampled from depths ranging from 17 to 28 ft bgs. Because these wells are located along the riverbank, the water chemistry has historically been heavily influenced by the Colorado River stage fluctuations.

The results presented in Figure 26 suggest the ammonia plume started migrating to the south since 2017, based on the sample data collected from well 0492. Between November 2011 and January 2017 the ammonia concentrations associated with this location were below 10 mg/L. Since that time the concentrations have ranged from 16 to 250 mg/L, with the most recent sample having a concentration of 220 mg/L (the concentration decreased to 79 mg/L in response to the 2019 flooding event). It is possible that this increase is in response to low river stages between August 2017 and April 2019, allowing for uninhibited migration from the upgradient plume source. Ammonia concentration increases also occurred in the samples collected from wells 0401, 0407, and especially well 0404, which increased from 380 to 670 mg/L during this same timeframe. Ammonia concentrations have gradually decreased since the December 2018 peak in the samples from well 0404, with the most recent event having a concentration of 270 mg/L. The lowest ammonia concentrations were associated with the samples collected from the wells TP-17, SMI-MW01, and TP-01. The data suggests the plume is contained within the area bounded to the south by TP-17 and between SMI-MW01 and TP-01 to the north.

As displayed in Figure 27, the uranium concentrations from wells 0492 and 0407 have also increased between August 2017 and April 2019. The uranium concentrations in samples collected from 0401 and 0404 have remained consistent over the past five years (both between 1 and 2 mg/L), suggesting no significant plume migration in this area of the plume. Of this set of wells, the concentrations associated with SMI-MW01 (located downgradient of the northeast uranium plume) have been the highest, peaking with a concentration of 5.9 mg/L in 2010, but gradually decreasing to 2.5 based on the results from the most recent event.

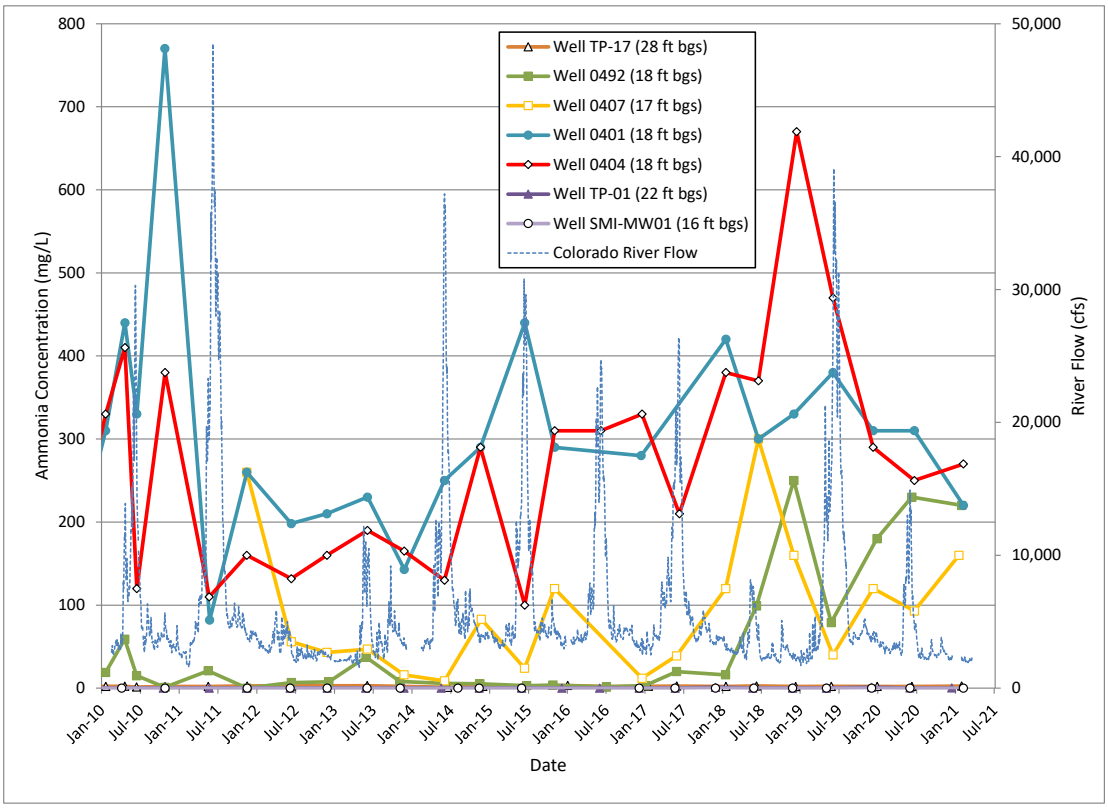

Figure 26. Riverbank Observation Wells TP-17, 0492, 0407, 0401, 0404, SMI-MW01, and TP-01 Time versus Ammonia Concentration Plot

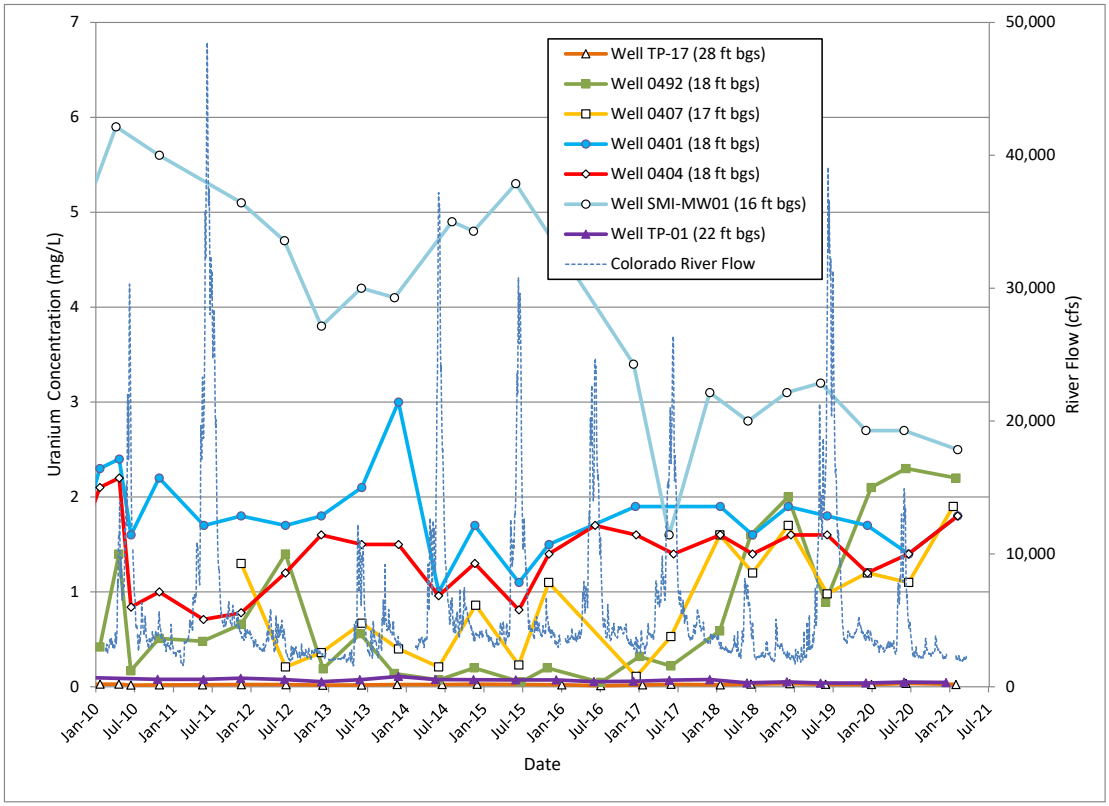

Figure 27. Riverbank Observation Wells TP-17, 0492, 0407, 0401, 0404, SMI-MW01, and TP-01 Time versus Uranium Concentration Plot

The results also suggest the uranium plume is bounded to the south near the location of well TP-17, where uranium concentrations have ranged from 0.012 to 0.037 since 2009. To the north, the results indicate the plume extent is in the vicinity of well TP-01, where the uranium concentrations have been below 0.1 mg/L since 2013 and above or just below the 0.044 mg/L UMTRA standard. Sample collection from this location during the most recent event was 0.046 mg/L. These data indicate the uranium plume has not significantly migrated to the north or south in the past 10 years.

4.3.6 Southern and Off-site Areas

Figures 28 and 29 are the plots for four locations sampled at the southern end of the site, wells TP-17, TP-20, TP-23, and 0454. Well TP-17 is located along the riverbank, TP-20 is located approximately 500 ft off the riverbank, and TP-23 and 0454 are located closer to the toe of the tailings pile. Sample depths range from 13 ft bgs (well 0454) to 32 ft bgs (TP-20).

Ammonia concentrations (Figure 28) in samples collected from wells TP-17 and TP-20 have consistently been below 5 mg/L since 2000, suggesting the ammonia plume has not significantly migrated past these locations during this time period. Groundwater flow is likely impeded by groundwater density differences related to the presence of the high density brine unit. During December 2020 specific conductance values were above 104,000 micro ohms per centimeter (µmhos/cm) at a depth of just 28 ft bgs and more than 137,000 µmhos/cm at a depth 32 ft bgs for wells TP-17 and -20 (respectively). These values suggest the brine unit is near the groundwater surface in this area of the site.

Ammonia concentrations in samples collected from well 0454 are impacted by flood events, as evidenced by the significant decrease observed in 2019. The specific conductance during this recent sampling event was more than 66,000 µmhos/cm at a depth of only 13 ft bgs, near the southwestern boundary of the groundwater system. Likewise, the sample from TP-23 was collected with a specific conductance of more than 30,000 µmhos/cm at a depth of 25 ft bgs. Well TP-23 is located 225 ft directly east of 0454, and the results from these samples provides insight into the ammonia concentration vertical differences in this portion of the ammonia plume.

Similar to the ammonia concentration results, uranium concentrations measured from wells TP-17 and TP-20 (Figure 29) suggest no uranium plume migration in this area of the site, likely for the same reason (presence of brine in near the groundwater surface). The sample collected from well TP-17 continues to be below the 0.044 mg/L UMTRA standard (since 2008), while the concentrations in samples from location TP-20 have been at or below this standard since 1997. Uranium concentrations associated with samples from well 0454 have consistently been lower compared to those in samples from TP-23, and this trend continued during this most recent event.

4.3.7 SMI-PW01 Cluster

During this most recent sampling event, all four wells associated with the SMI-PW01 cluster were sampled, with samples collected from 18, 40, 57, and 73 ft bgs. This cluster is located approximately 250 ft from the river bank. Figures 30 and 31 contain plots displaying the ammonia and uranium concentrations measured at these various depths.

When analyzing well cluster data, it is important to note the depth of the brine interface. This interface was established to be equal to a TDS concentration of 35,000 mg/L, as documented in the 2002 *Characterization of Groundwater Brine Zones at the Moab Project Site (Phase 1)*.

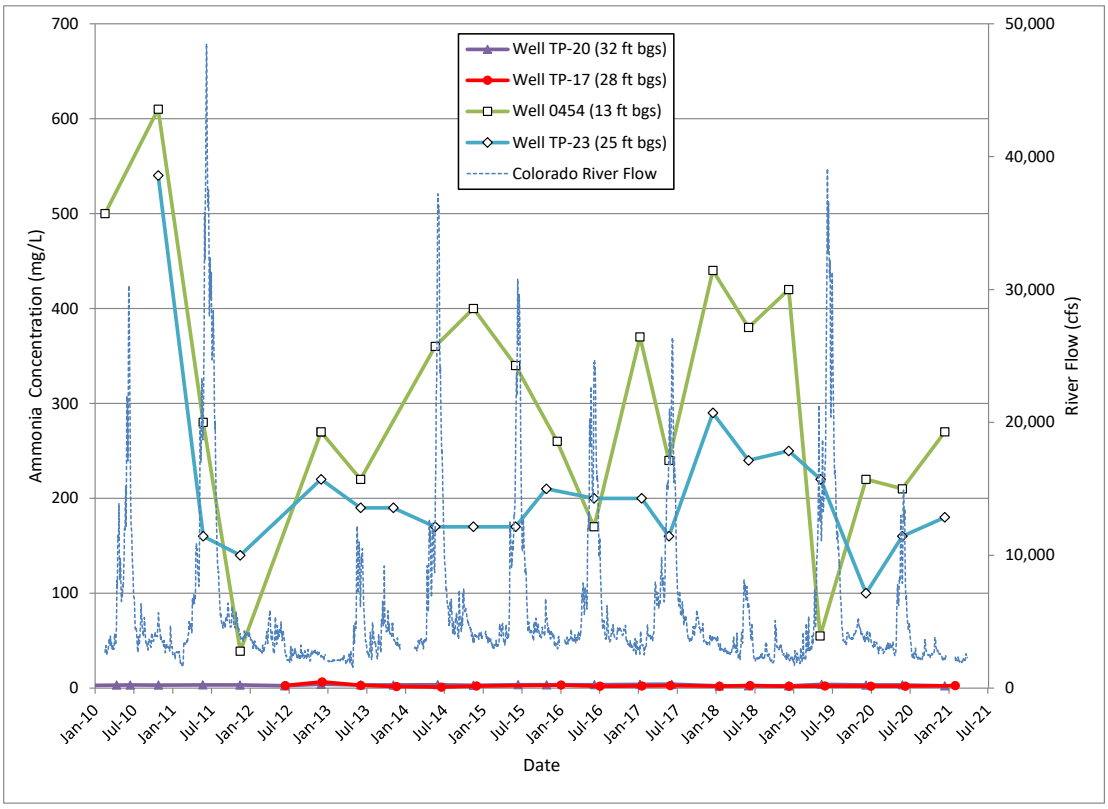

Figure 28. South of Site Observation Wells TP-17, TP-20, TP-23, and 0454 Time versus Ammonia Concentration Plot

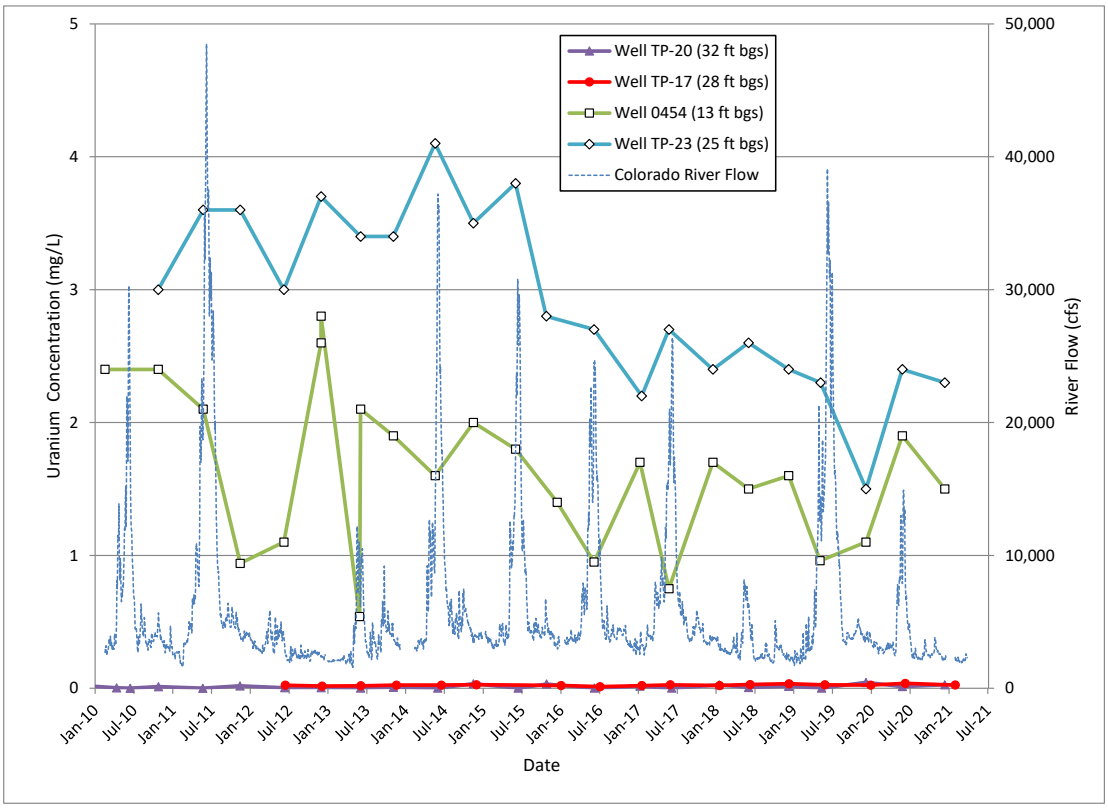

Figure 29. South of Site Observation Wells TP-17, TP-20, TP-23, and 0454 Time versus Uranium Concentration Plot

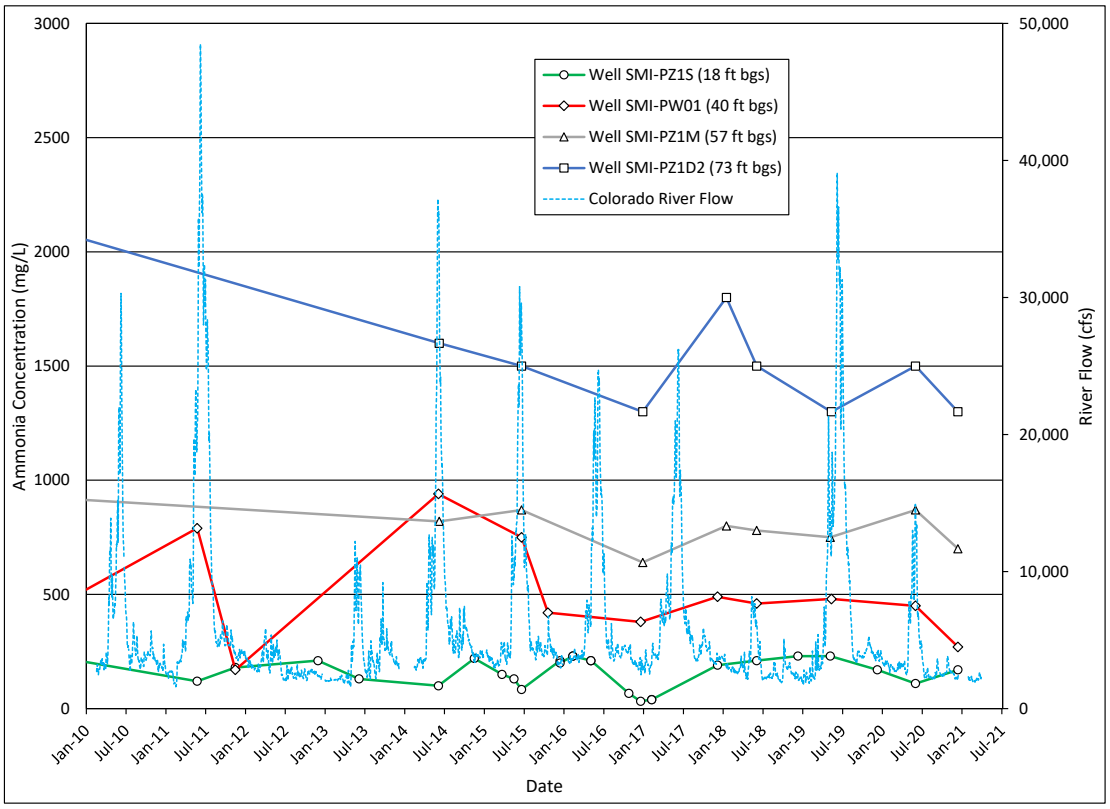

Figure 30. SMI-PW01 Well Cluster Time versus Ammonia Concentration Plot

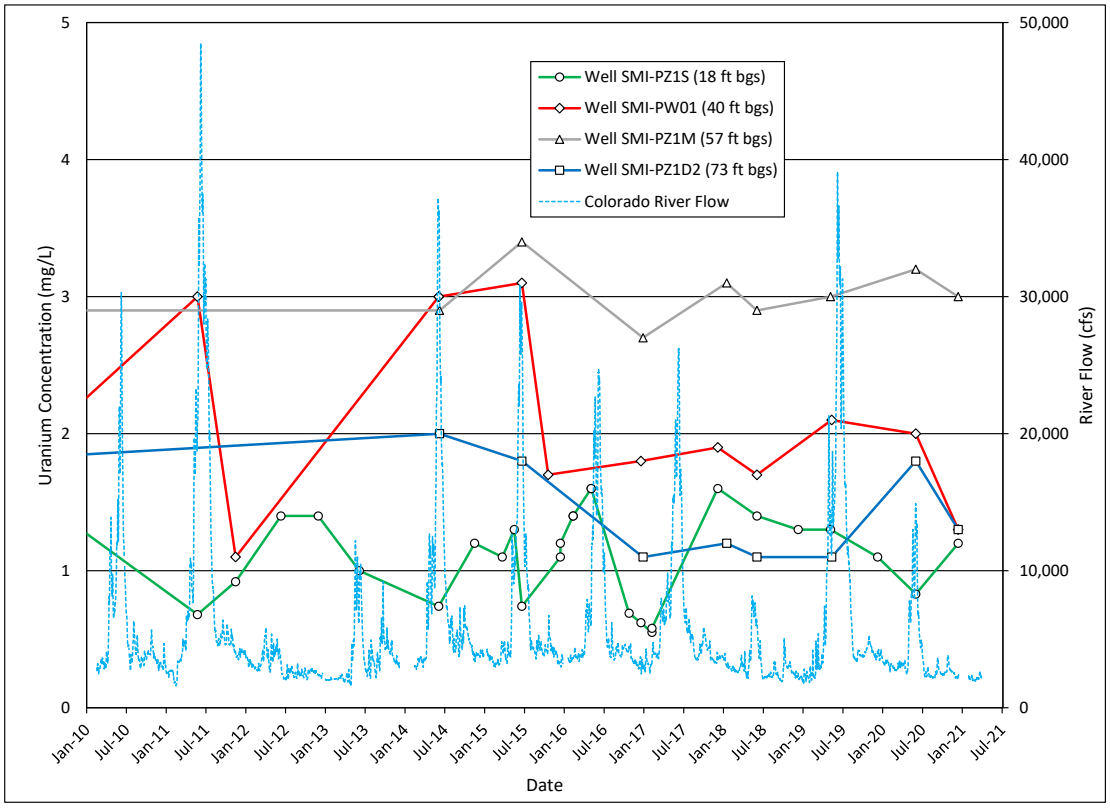

Figure 31. SMI-PW01 Well Cluster Time versus Uranium Concentration Plot

Vertical contaminant migration through the groundwater system is reduced due to density differences. Based on the results of this characterization sampling, a specific conductance of 59,000 µmhos/cm is equal to 35,000 mg/L TDS. Table 22 provides the sample depth, specific conductance, and both ammonia and uranium concentrations. Between 55 and 75 ft bgs the specific conductance increases from approximately 29,000 to 103,000 µmhos/cm, indicating the brine interface was present between these depths during this sampling event.

Table 22. December 2020 PW01 Cluster Sample Depths, Specific Conductance, Ammonia Concentrations, and Uranium Concentrations

Well	Sample Depth (ft bgs)	Specific Conductance (µmhos/cm)	Ammonia Concentration (mg/L)	Uranium Concentration (mg/L)
SMI-PZ1S	18	10,974	170	1.2
SMI-PW01	40	12,663	270	1.3
SMI-PZ1M	55	29,176	700	3.0
SMI-PZ1D2	73	103,666	1,300	1.3

As displayed in Figure 30, the sampling associated with this well cluster indicates that ammonia concentrations increase with depth, a trend that is consistent with the brine characterization report. During this most recent event, the ammonia concentrations ranged from 170 mg/L at a depth of 18 ft bgs to 1,300 mg/L at a depth of 73 ft bgs. Uranium concentrations (Figure 31) do not follow this same trend of increasing concentrations with depth, with highest concentrations associated with the samples collected from a depth of 55 ft bgs. Uranium appears to be less mobile compared to ammonia when coming in contact with the brine interface. This same vertical uranium profile is also consistent with the results of the 2002 characterization sampling. Uranium concentrations ranged from 1.2 to 3.0 mg/L in this area of the plume.

4.3.8 SMI-PW03 Cluster

The well PW-03 cluster consists of five wells. Well SMI- PW03 is screened from 20 to 60 ft bgs, and was sampled at a depth of 60 ft bgs. Samples were also collected from wells SMI-PZ3S, -PZ3M, and –PZ3D2 at depths of 25, 59, and 78 ft bgs, respectively. In addition, nearby well 0436 was sampled at a depth of 197 ft bgs to provide a more complete vertical profile of the groundwater system at this location. Figures 32 and 33 are the plots displaying the ammonia and uranium concentrations measured at these various depths. Similar to the PW01 cluster, the depth of the brine interface in this area of the groundwater system plays a role in the vertical distribution of the contaminants. Table 23 provides the sample depth, specific conductance, and both ammonia and uranium concentrations for the SMI-PW03 cluster sampling. Specific conductivity measurements during this sampling event indicate the brine interface was present between 78 and 197 ft bgs at this location.

Table 23. February 2021 SMI-PW03 Cluster Sample Depths, Specific Conductance, Ammonia Concentrations, and Uranium Concentrations

Well	Sample Depth (ft bgs)	Specific Conductance (µmhos/cm)	Ammonia Concentration (mg/L)	Uranium Concentration (mg/L)
SMI-PZ3S	25	4,563	1.7	0.8
SMI-PZ3M	59	8,618	19	0.31
SMI-PW03	60	10,237	33	0.36
SMI-PZ3D2	78	21,675	240	0.86
0436	197	116,770	2.4	0.0097

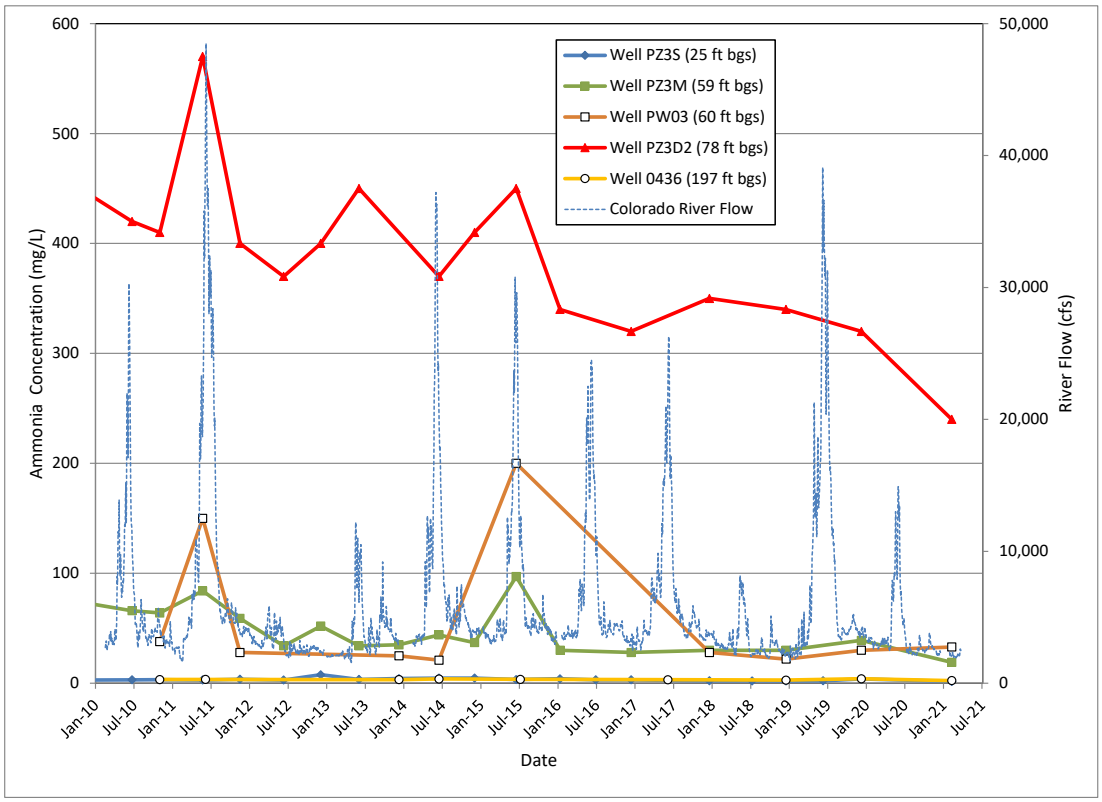

Figure 32. SMI-PW03 Well Cluster Time versus Ammonia Concentration Plot

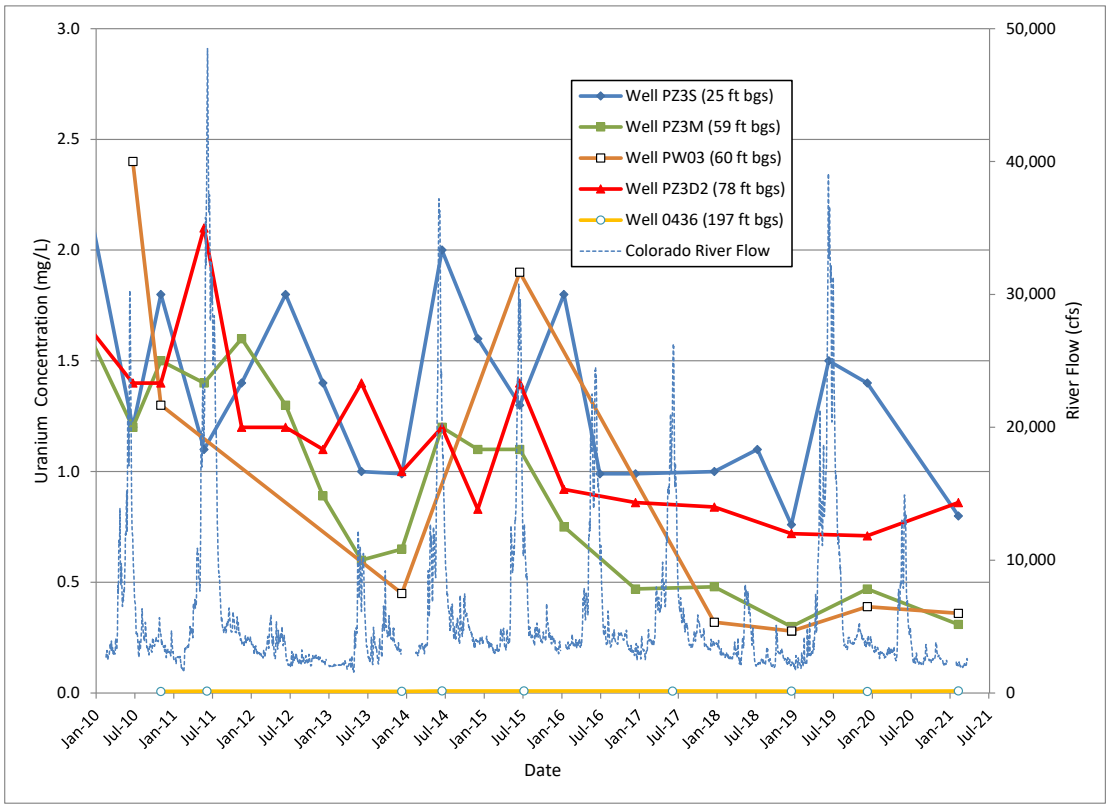

Figure 33. SMI-PW03 Well Cluster Time versus Uranium Concentration Plot

During the recent sampling event the ammonia concentrations (Figure 32) were highest in the sample collected from a depth of 78 ft bgs (the more shallow brine zone), which is consistent with the 2002 groundwater brine characterization results. Samples collected from 25 and 197 ft bgs had the lowest concentrations (less than 3 mg/L), while the samples collected from 59 and 60 ft bgs were similar (as expected, based on the sampling depths).

The uranium results are also consistent with the brine characterization study, with the samples collected from 25 and 78 ft bgs having the highest (and similar) uranium concentrations. Since 2010 the concentrations from SMI-PZ3S have ranged from 0.76 to 2.0 mg/L, while the concentrations from SMI-PZ3D2 have ranged from 0.71 to 2.1 mg/L. Based on Figure 33, concentrations at all depths in this location have in general been gradually decreasing since 2016.

4.3.9 ATP-1 Cluster

Wells ATP-1-S, ATP-1-IS, ATP-1-ID, and ATP-1-D comprise the ATP-1 cluster, and were sampled from 150, 213, 293, and 395 ft bgs, respectively. Due to the completion depths, these wells provide data associated within the deeper zones of the groundwater system in the vicinity of the base of the tailings pile. Previous to this site-wide sampling event, these wells were most recently sampled in 2014 and 2016.

Figures 34 and 35 are the plots displaying the ammonia and uranium concentrations (respectively) measured at these various depths since 2010. Most recent results, along with the specific conductance and sample depths, are presented in Table 24.

Table 24. January 2021 ATP-1 Cluster Sample Depths, Specific Conductance, Ammonia Concentrations, and Uranium Concentrations

Well	Sample Depth (ft bgs)	Specific Conductance (µmhos/cm)	Ammonia Concentration (mg/L)	Uranium Concentration (mg/L)
ATP-1-S	150	135,439	3.0	0.00019
ATP-1-IS	213	129,996	2.4	ND
ATP-1-ID	293	130,619	4.9	ND
ATP-1-D	395	141,490	8.5	0.00018

Note: ND = Concentration below 0.00002 mg/L detection limit

The data indicate minimal ammonia and essentially no uranium was present in the sample collected from this location. In addition, the concentrations have not significantly changed since 2014. As suspected, and based on other wells in this vicinity, the brine interface is above 150 ft bgs.

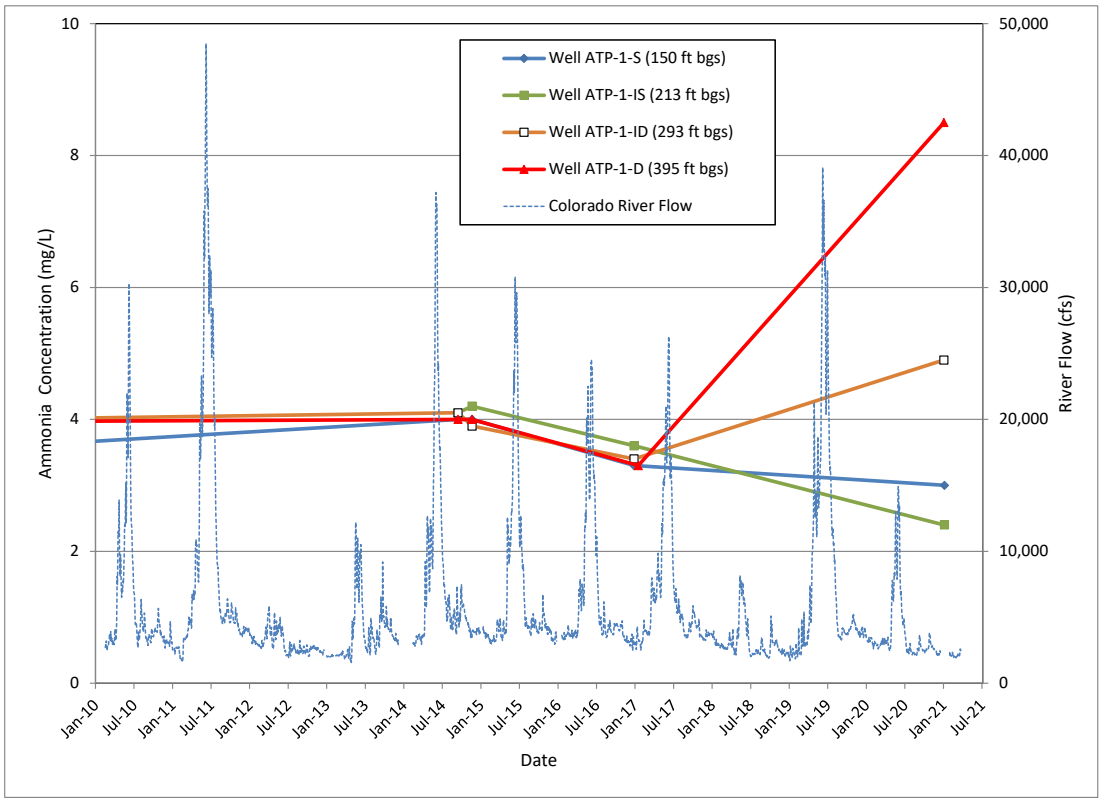

Figure 34. ATP-1 Well Cluster Time versus Ammonia Concentration Plot

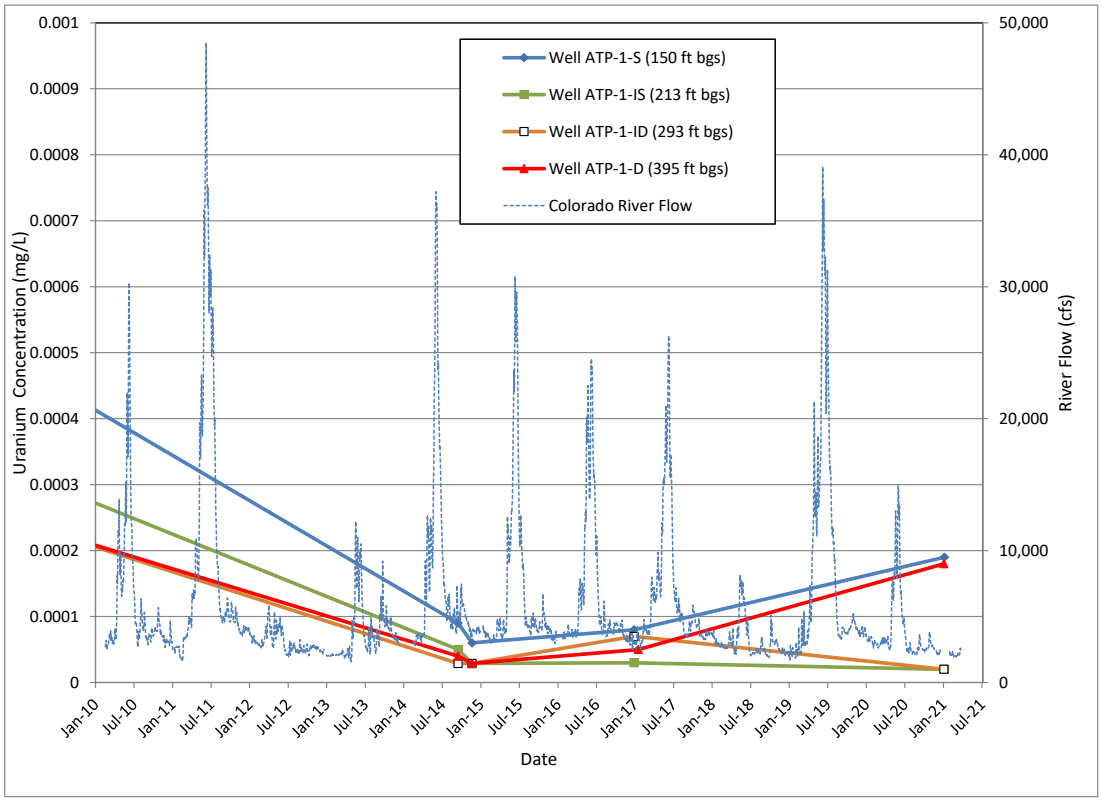

Figure 35. ATP-1 Well Cluster Time versus Uranium Concentration Plot

4.3.10 Response to CF5 Extraction

The sampling of wells AMM-2 and SMI-PZ2M2 provide some insight on how the CF5 extraction wells are impacting the groundwater system. Results from these monitoring wells are presented with the data collected from nearby extraction wells.

Monitoring well AMM-2 is located approximately 100 ft off extraction well 0813, and samples were collected from a depth of 48 ft bgs. Figures 36 and 37 present the ammonia and uranium concentrations (respectively), along with trend lines (linear) associated with the data collected from well AMM-2 and 0813. Figure 36 displays how the concentration fluctuations from the two wells generally are similar since 2009/2010, with the concentrations consistently higher in well AMM-2. Trend line data associated with the AMM-2 data set indicates the ammonia concentrations have on average decreased 12.5 mg/L per year since 2009, while extraction well 0813 has increased on average 6.9 mg/L per year (Table 15). Well field 2011 flooding in addition to the fact that monitoring well AMM-2 samples are collected below the screen interval of extraction well 0813 may explain this difference.

Figure 37 displays the uranium concentrations from both wells, and with the exception of the sample collected in May 2018, the AMM-2 concentrations are in general 0.5 mg/L higher compared to 0813. The trend line generated from the AMM-2 data set results in a uranium concentration increase of 0.05 mg/L per year on average, while the 0813 trend line indicates an increase of 0.06 mg/L per year (Table 16).

Monitoring well SMI-PZ2M2 is within the SMI-PW02 well cluster (less than 20 ft away), and samples were collected from a depth of 56 ft bgs. Figures 38 and 39 presents the ammonia and uranium concentrations (respectively) measured from samples collected from extraction well SMI-PW02 and monitoring well SMI-PZ2M2. Also provided on the plot is the linear trend line associated with the SMI-PZ2M2 data set. The results indicate ammonia concentrations (Figure 38) from both locations have gradually decreased since 2009, with SMI-PZ2M2 generally having the higher concentration. The trend line associated with well SMI-PZ2M2 ammonia concentrations exhibits a decrease in the ammonia concentration of 47.9 mg/L per year, while extraction well SMI-PW02 has decreased on average 13.1 mg/L per year (Table 15).

Figure 39 is a plot of the uranium concentrations for these locations. Results associated with the sampling from these locations indicate the SMI-PW02 the uranium concentrations are consistently higher compared to the SMI-PZ2M2 concentrations. The trend line associated with the SMI-PZ2M2 data set suggests the uranium concentration has increased on average 0.12 mg/L per year, while the SMI-PW02 concentration on average has not changed significantly (only decreasing 0.01 mg/L per year, as shown in Table 16).

Results from both these monitoring well locations indicate the CF5 extraction appears to impact the groundwater system close to the extraction wells, especially regarding ammonia concentrations. Results indicate ammonia concentrations have been gradually decreasing in the samples collected from these monitoring wells, a trend that is not apparent in wells located in areas outside of the influence of the CF5 extraction wells. Uranium concentrations, likely due to geochemical processes, have not displayed the same decrease over time. This trend is also displayed in the extraction well results (Table 16).

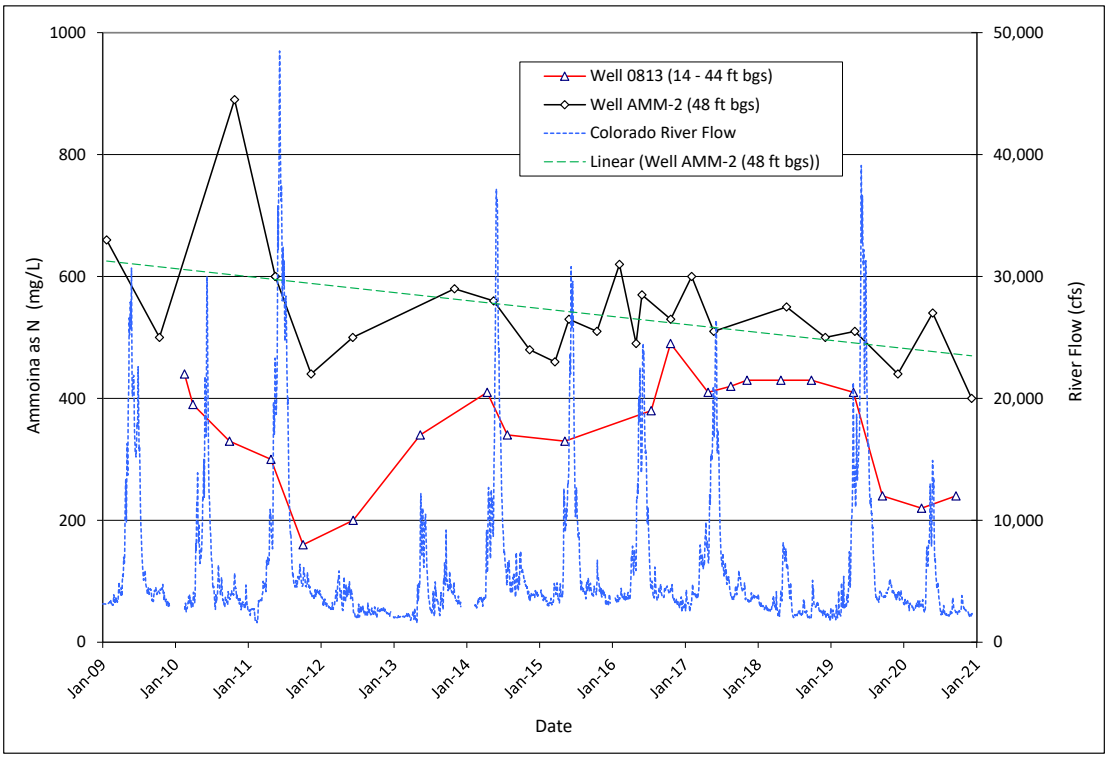

Figure 36. Monitoring Well AMM-2 and Extraction well 0813 Time versus Ammonia Concentration Plot and Trend Line

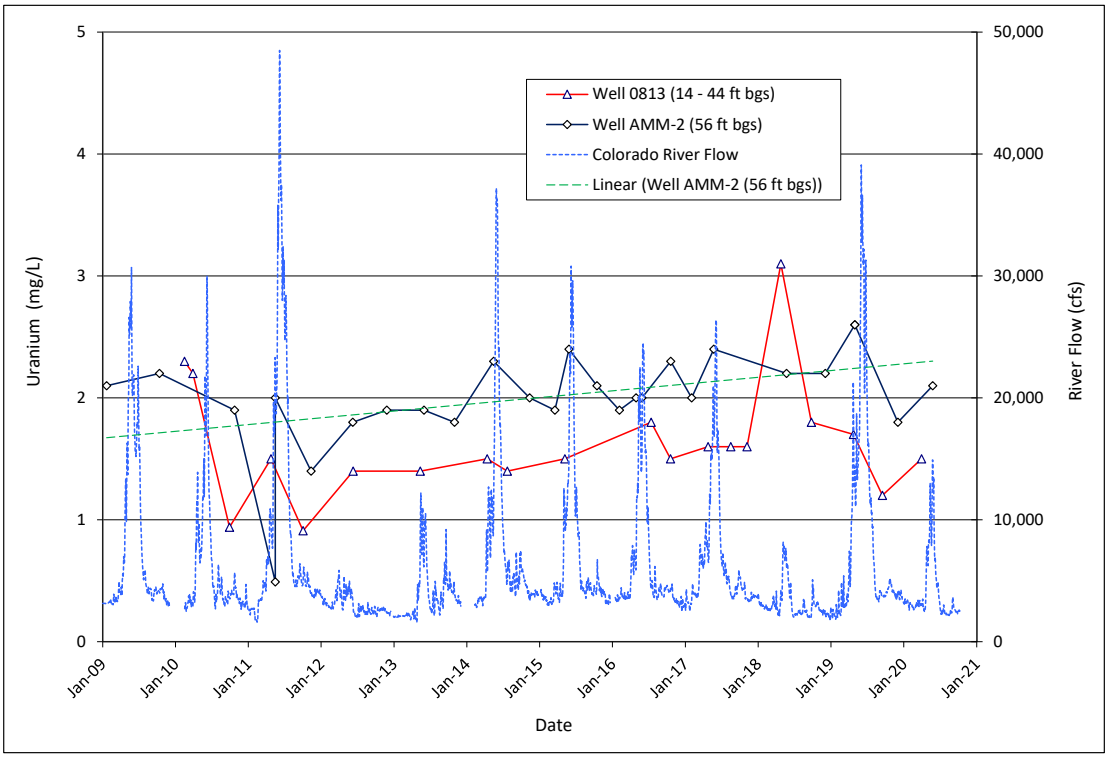

Figure 37. Monitoring Well AMM-2 and Extraction well 0813 Time versus Uranium Concentration Plot and Trend Line

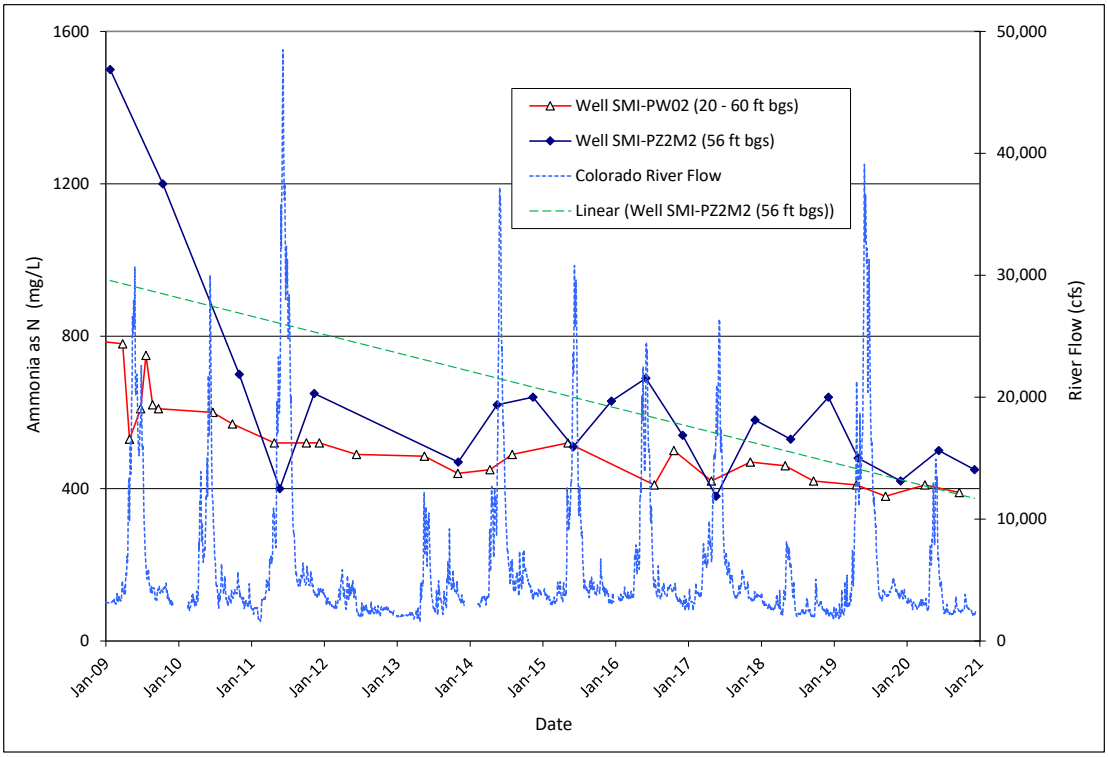

Figure 38. Monitoring Well SMI-PZ2M2 and Extraction well SMI-PW02 Time versus Ammonia Concentration Plot and Trend Line

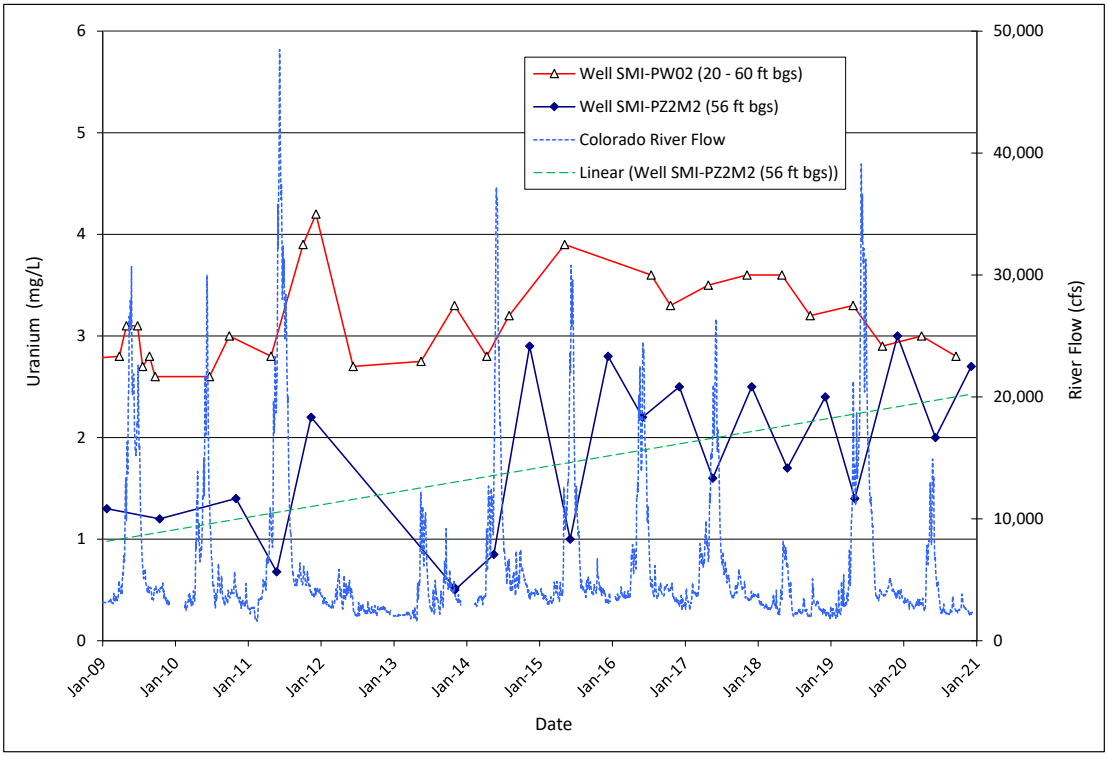

Figure 39. Monitoring Well SMI-PZ2M2 and Extraction well SMI-PW02 Time versus Uranium Concentration Plot and Trend Line

4.3.11 Surface Water Sampling Results

Table 25 presents the ammonia results from the surface water samples collected in January/February 2021 from locations 0201, 0218, 0226, CR1, CR2, CR3, and CR5 (as shown in Figure 5). Location 0274 (located with the side channel of CF4) is also typically sampled, but it was dry at the time of sampling due to below average river flows. The ammonia results are used along with the temperature and pH data to derive applicable EPA criteria for both acute and chronic levels. These criteria are presented with the ammonia results in Table 25 and represent a snapshot at the time the samples were collected. Appendix A details how these instantaneous criteria are used to derive monthly averages for habitat management.

Table 25. January/February 2021 Site-wide Surface Water Ammonia Concentrations and Comparisons to EPA Acute and Chronic Criteria

Location	Date	Temp (ºC)	pH	January/February 2021 Ammonia as N (mg/L)	EPA - Acute Total as N (mg/L)*	EPA - Chronic Total as N (mg/L)**
0201	1/27/21	1.2	7.38	<0.2	24	3.5
0218	1/27/21	0.9	7.86	<0.2	11	2.1
0226	2/1/21	2.5	8.48	<0.2	3.3	0.8
CR1	1/27/21	1.8	6.37	1.6	51	4.9
CR2	1/27/21	0.9	7.83	<0.2	13	2.3
CR3	2/1/21	2.3	8.35	0.35	4.1	0.95
CR5	1/27/21	0.7	7.57	<0.2	18	2.9

Notes: *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 0.2 mg/L detection limit in five of the seven locations, and the two above the detection limit were below 1.6 mg/L. All surface water ammonia concentrations are below the applicable EPA criteria for both acute and chronic concentrations.

4.4 Groundwater Surface Elevations

Water level data to generate the groundwater surface contour map were collected in early December 2020. The Colorado River mean daily flows during this time period ranged from 2,030 to 2,240 cfs, which translates into a river surface elevation at the southern end of the site of only 3,953.0 to 3,953.1 feet above mean sea level. These flows were significantly below normal (the average mean daily flows for these dates ranged from 3,340 to 3,500 cfs) in response to continued drought conditions experienced in this region.

Because river elevations fluctuated only 0.1 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 40. This contour map displays how the site groundwater system responds to the river during primarily gaining conditions, when groundwater discharges into the river. Groundwater flow direction and the gradient displayed in this contour map are comparable to historical contour maps generated using groundwater data collected during river base flow conditions.

4.5 Contaminant Distribution

Figures 41 and 42 are maps showing shallow groundwater ammonia and uranium plumes, respectively, using data collected during the December 2020/February 2021 site-wide event. Data collected typically from less than 50 ft bgs were used to generate these plume maps.

During river base flows, contaminant concentrations tend to rebound after being diluted during spring runoff peak flows. Minimal plume migration has occurred since the previous site-wide event, as discussed in Sections 4.3.4, 4.3.5, and 4.3.6. In general, the plume maps are comparable to previous plume maps generated using data collected during the river base flows.

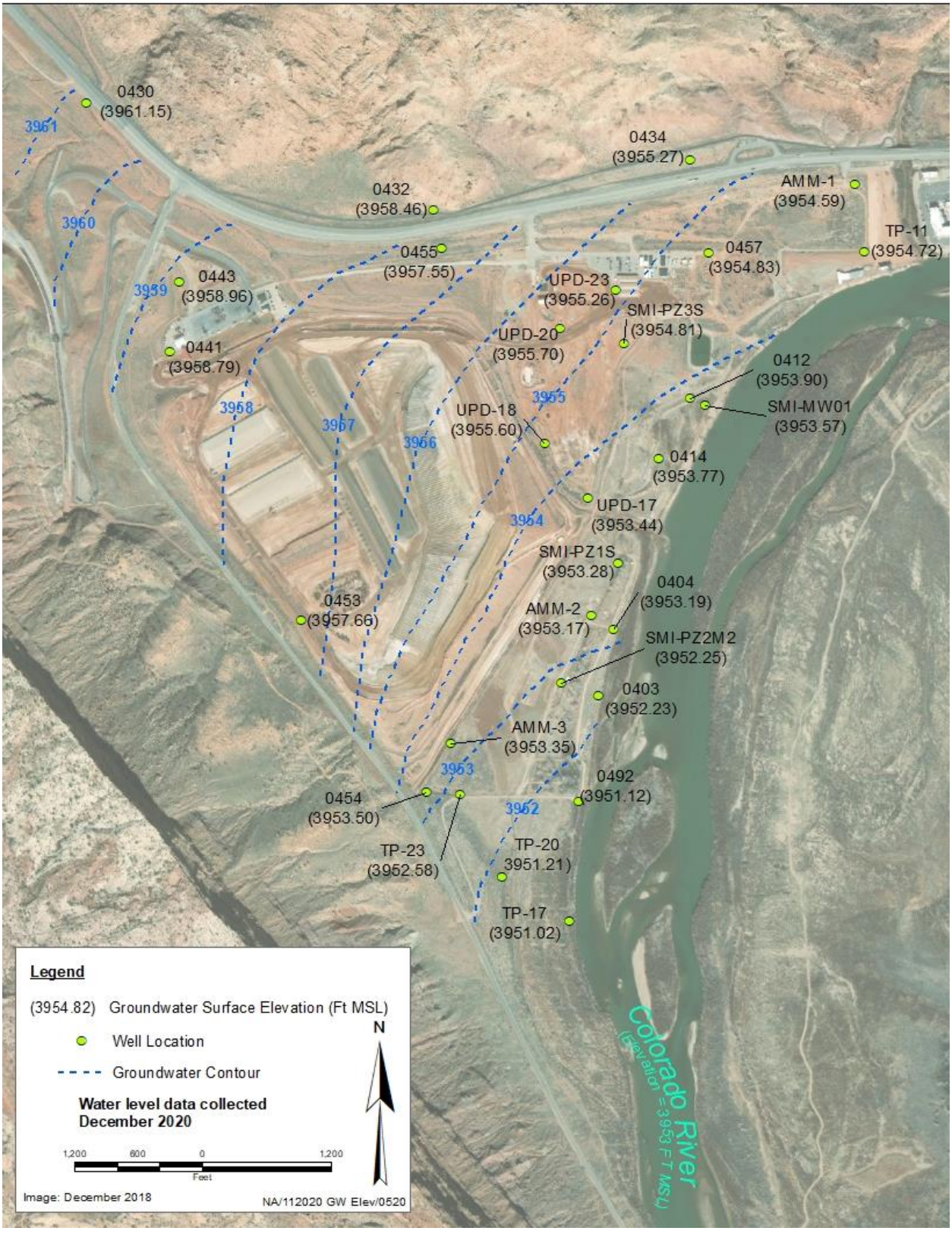

Figure 40. Site-wide Groundwater Elevations, December 2020

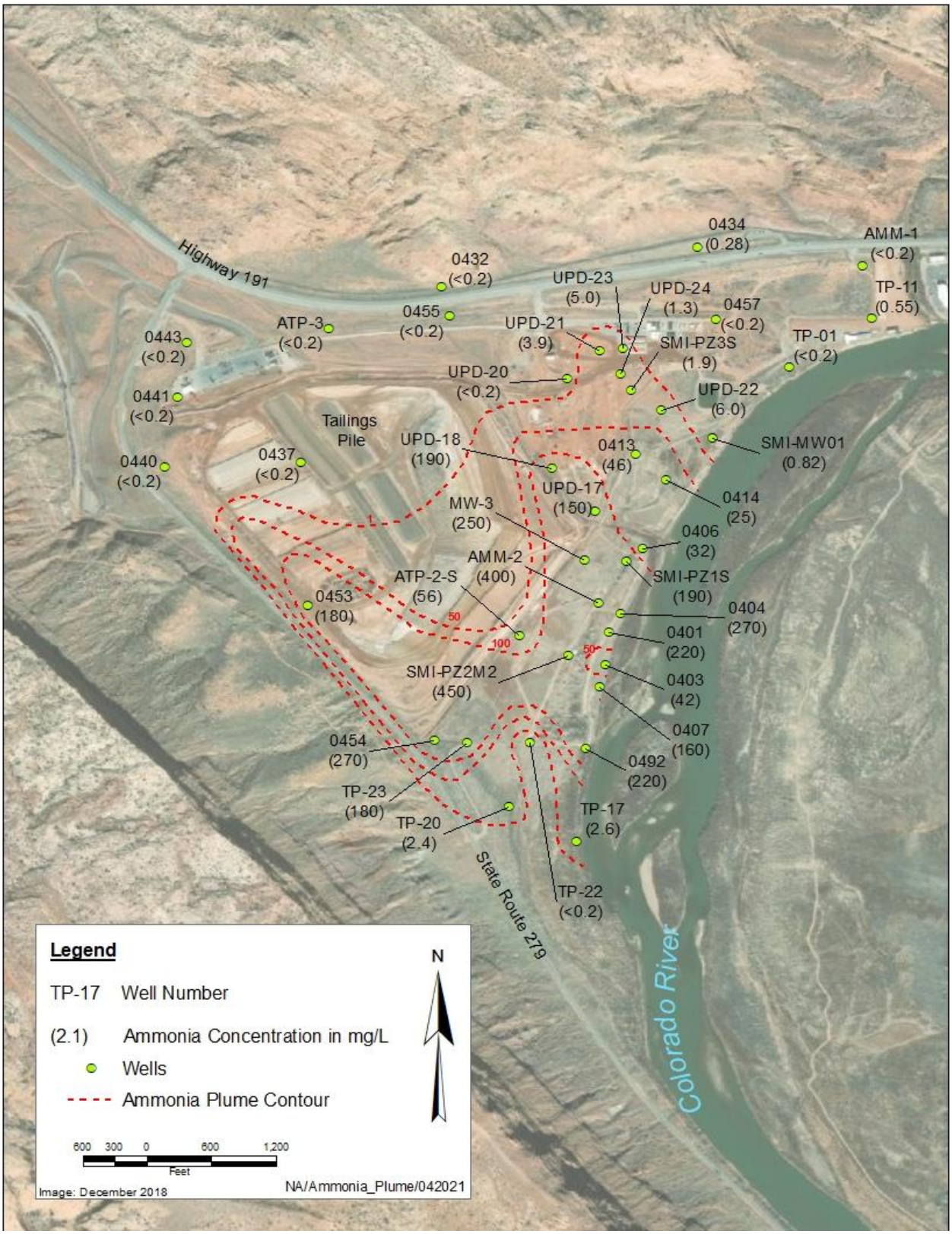

Figure 41. Ammonia Plume in Shallow Groundwater, December 2020-February 2021

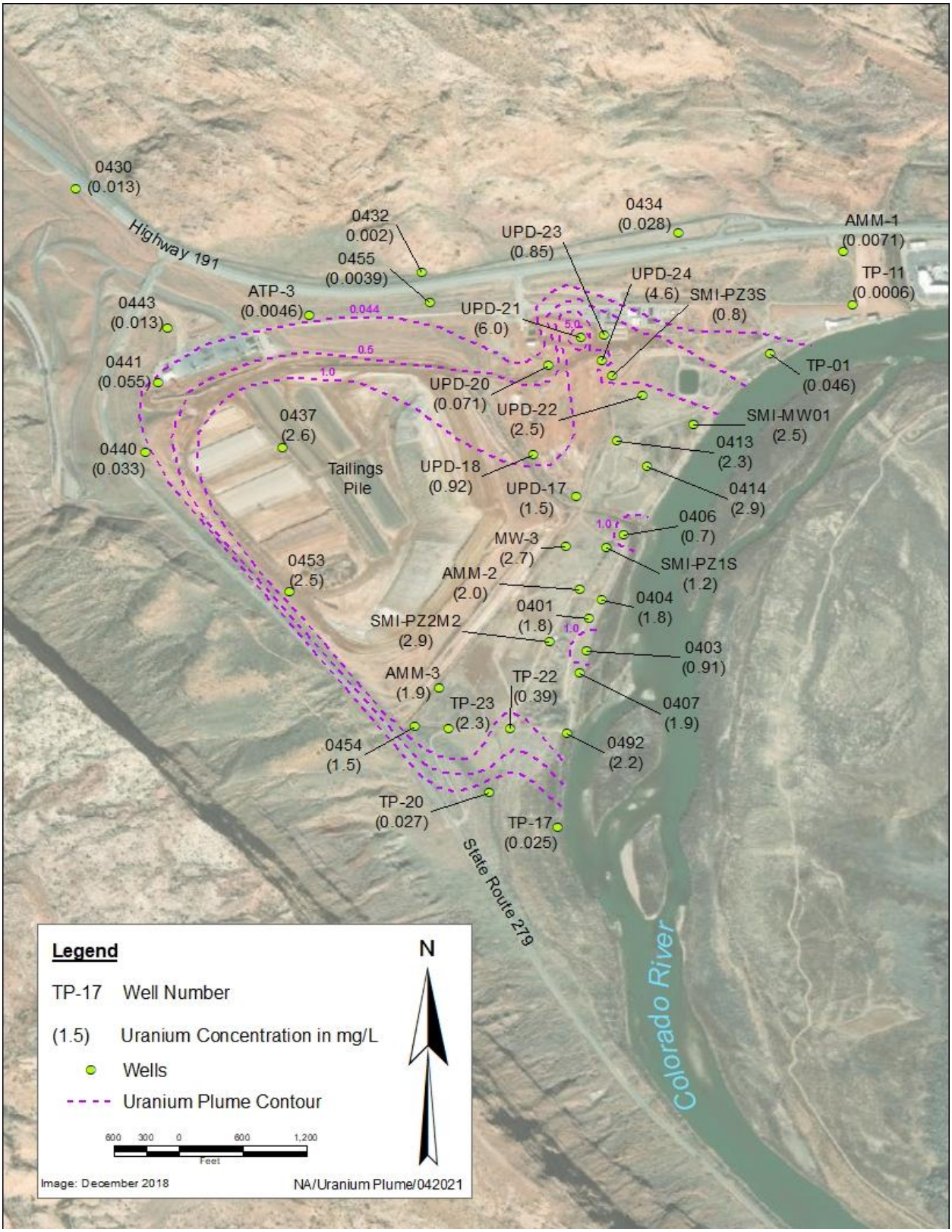

Figure 42. Uranium Plume in Shallow Groundwater, December 2020-February 2021

5.0 Conclusions

This report presents the results of sampling conducted at the Moab and Crescent Junction sites between December 2020 and February 2021. 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 17 for a complete list of the Moab site locations and associated uranium concentrations that exceeded this 0.044 mg/L uranium standard. Select locations were also analyzed for arsenic and selenium, which have EPA Drinking Water Standards of 0.01 and 0.05 mg/L, respectively. Tables 18 and 19 provide the locations and associated concentrations that exceeded these standards.

There were five anomalous data points associated with these three sampling events. One anomalous data point was associated with the sample collected from well 0205, with the uranium-234 result concentration more than 50% above the historical maximum. Four anomalous data points were associated with the site-wide event. Well 0414 had a selenium concentration 50% below the historical minimum, and well ATP-1-D had an ammonia concentration that was 50% above the historical maximum. In addition, surface water sampled from location CR-1 contained ammonia and uranium concentrations 50% above the historical maximums.

5.1 September 2020 Habitat, CF4, and CF5 Sampling Event

Samples were collected from a suitable habitat area in September. Sample splits were sent to the lab to confirm the ammonia probe, which was used to analyze the majority of the samples collected while the suitable habitat was present, provided representative results. The four results analyzed by the analytical laboratory were comparable, suggesting the ammonia probe results associated with samples collected while the habitat was present were accurate.

The collection of groundwater samples from observation wells surrounding the CF4 injection wells in September 2020 and January 2021 (as part of the site-wide event) was to determine how long the injection system impacted the groundwater system after minimal fresh water was injected into the CF4 wells. The analytical results indicate a significant reduction in ammonia concentrations in the downgradient (east) direction, particularly in the zone above 28 ft bgs. After 3 months of minimal injection the downgradient shallow zone still had reduced ammonia concentrations. However, after 3 additional months of minimal freshwater injection, the concentrations had returned to baseline levels.

All eight CF5 wells were sampled to monitor contaminant concentration trends over time and update the contaminant concentrations used for the mass removal calculations. Statistical analysis of the data collected from the CF5 wells during the past ten years indicates the ammonia concentrations on average have decreased 8 mg/L/yr, while during the same time period the uranium concentrations have on average increased 0.01 mg/L/yr.

5.2 December 2020 Crescent Junction Sampling Event

The rationale for collecting the groundwater sample from Crescent Junction monitoring well 0202 is to determine if the source of the water that recharges this location is the same as that which recharges well 0205. The sample collected from well 0205 was collected to determine if there were any changes to the source of the groundwater recharging this location. Both samples collected in December were part of the quarterly monitoring for the fourth quarter of 2020. In addition to the standard analytes, the samples were also analyzed for bicarbonate as $CaCO_3$, carbonate as $CaCO_3$, total alkalinity as $CaCO_3$, uranium-234, uranium-235, and uranium-238. The analyte concentrations in the samples collected from wells 0202 and 0205 are similar, suggesting both are recharged by precipitation events, and the water is not associated with leachate from the Crescent Junction disposal cell.

5.3 May/June 2019 Site-wide Sampling Event

The rationale for conducting the December 2020 through February 2021 site-wide sampling event was to collect data from the site during Colorado River base flows and to assess any changes in the contaminant plume migration or trends in the groundwater system water chemistry. The river flows were lower than average due to continue drought conditions this region has been experiencing. Surface water sampling was also conducted to assess surface water quality adjacent to the site compared to upstream and downstream water quality.

In general, there was minimal plume migration based on the samples collected from wells located along the plume boundaries. Ammonia concentrations from the seven surface water samples collected during this sampling event were below the applicable EPA criteria (for a suitable habitat) for both acute and chronic concentrations.

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), *Characterization of Groundwater Brine Zones at the Moab Project Site (Phase 1)* (GJO-2002-333-TAR, GJO-MOA 19.1.2-3).

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.
September 2020 Habitat, CF4, and CF5 Sampling Event

Habitat Ammonia Probe Results
Water Sampling Field Activities Verification
Minimums and Maximums Report
Water Quality Data
Water Level Data
Trip Report

Appendix A. September 2020 Habitat CF4, and CF5 Sampling Event
Habitat Ammonia Probe Results

On June 22, 2020, staff identified the channel closest to CF4 as a backwater fish habitat and immediately set up the surface water diversion manifold to begin diverting fresh water into the backwater channel. Samples BW01through BW03 (Figure A1) in this area were collected and analyzed twice before river flows decreased enough that the area dried up and was no considered a suitable habitat. It was also noted that once the diversion stopped running on July 8, fish were no longer present in the backwater. The surface water diversion system was utilized to dilute the ammonia concentrations at this location from June 22 through July 8.

A second habitat area was present from July 8 through July 13 and was sampled twice (from locations SC01 through SC06, Figure A1) while fish were present. The surface water diversion system was operational in this habitat area for the duration of its existence.

The third habitat area in 2020 was present from July 13 through October 1. Locations SC07 through SC09 were sampled eleven times during that time period and locations SC10 through SC13 were sampled nine times. All sample locations and habitat areas are provided on Figure A1.

Several other locations were sampled to collect Colorado River background ammonia concentration data. These locations include MC01 (main channel Colorado River), SWD01 (outflow of surface water diversion) and BG01 through BG04 (Figure A2). These background sample locations were selected since they were similar to habitats that exist which are 1) not impacted by groundwater discharge containing elevated ammonia concentrations, and 2) having the main channel river water simulating the impacts of the surface water diversion system. All results show low ammonia levels except for SWD01 (which is located between SC12 and SC13 on Figure A1) on July 30. A change in the river stage over a weekend impacted the manifold's ability to dilute the concentrations in this area. Therefore, it was not considered a representative background sample again until the manifold placement was adjusted that day.

Table A1. Sample results for background locations

Sample Location	Sample Date	Temperature	pH	Ammonia
BG01	8/20/2020	23.78	8.41	0.29
BG02	8/20/2020	24.1	8.85	0.09
BG03	8/20/2020	24.09	8.92	0.08
BG04	8/20/2020	23.99	8.5	0.09
MC01	7/15/2020	24.23	8.3	0.13
MC01	7/30/2020	24.66	8.35	0.16
MC01	8/4/2020	27.48	8.49	0.06
MC01	8/11/2020	22.35	8.18	0.14
SWD01	7/15/2020	25.55	7.96	0.29
SWD01	7/30/2020	24.63	8.14	1.01

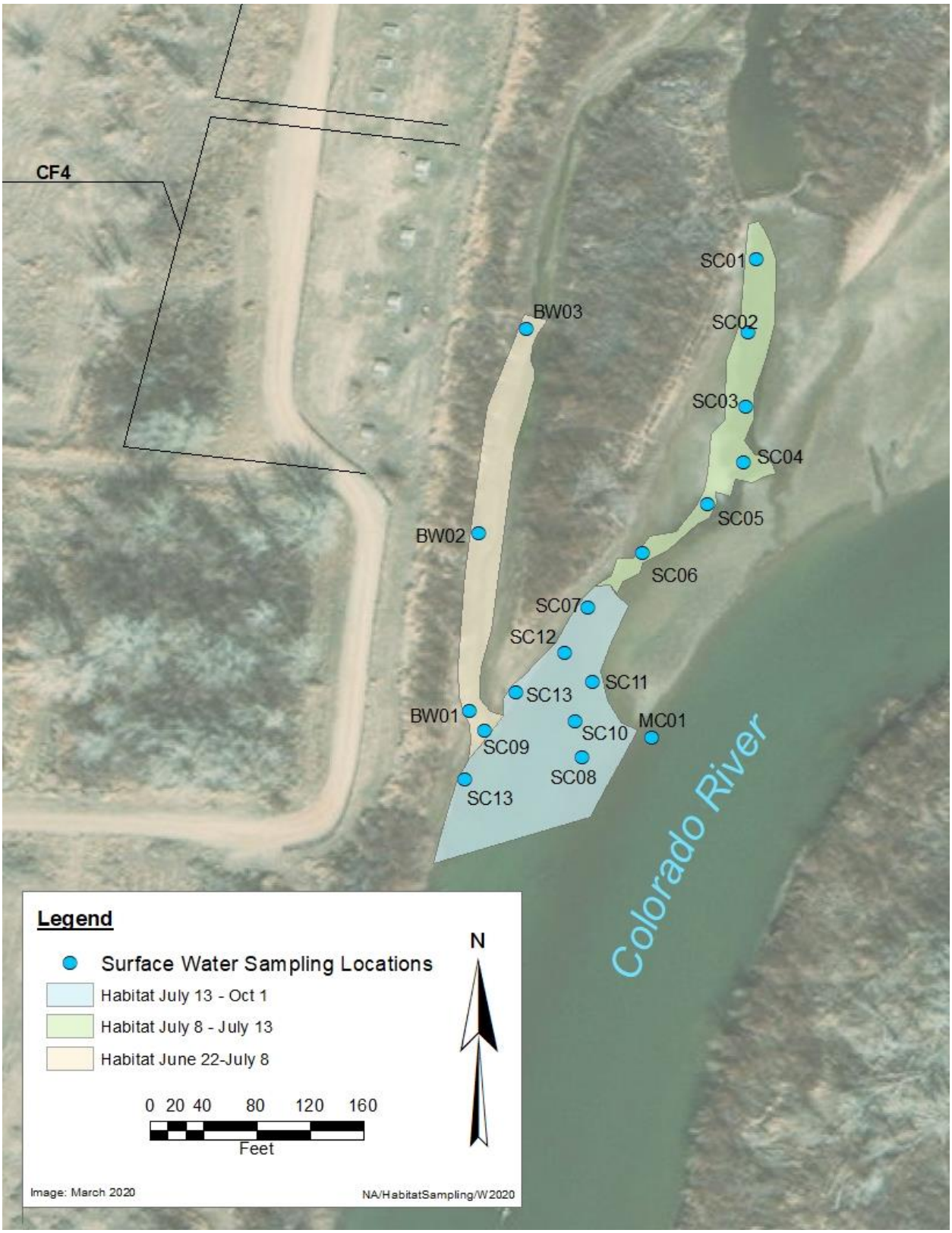

Figure A1. 2020 Habitat Sampling Locations

Figure A2. Upriver background data sample locations

Table A2. Upriver background data sample locations

Sample Location	River Flow Range (CFS)
BW01, BW02, and BW03 (CF4 backwater channel)	6,240 CFS – 4,560 CFS
SC01, SC02, and SC03 (side channel far side of island; upper section)	4,560 CFS – 3,570 CFS
SC04, SC05, and SC06 (side channel far side of island; middle section)	4,560 CFS – 3,570 CFS
SC07, SC08, and SC09 (side channel far side of island; lower section)	3,570 – 2,100 CFS
MC01 (Main channel Colorado River)	Always
SWD01 (Outflow of surface water diversion)	Whenever surface water diversion is running

The third suitable habitat, associated with locations SC07 through SC13, was the largest and the most challenging to adequately reduce ammonia concentrations throughout the season. One diversion manifold was originally placed, but quickly thereafter a second was added in hopes of further diluting the concentrations in a greater area. Two manifolds were run from July 28 through August 13, at which time a third was added. All three manifolds diverted freshwater into the habitat until October 1.

Throughout the season, 94 samples were collected in the different habitat areas and in background locations. Information gathered during these sampling events was used to dictate manifold placement. Table A3 shows all temperature, pH, and ammonia results from the various habitats.

Table A3. 2020 Ammonia sampling results

Sample Location	Sample Date	Temperature	pH	Ammonia
BW01	6/24/2020	21.56	7.35	0.1148
BW01	7/8/2020	22.87	8.05	0.959
BW02	6/24/2020	21.96	7.6	0.0348
BW02	7/8/2020	23.19	8.1	0.06
BW03	6/24/2020	18.39	7.67	0.1871
BW03	7/8/2020	23.8	8.11	0.084
SC01	7/8/2020	18.1	8	0.516
SC01	7/9/2020	20.57	7.62	0.927
SC02	7/8/2020	17.69	7.26	51.1
SC02	7/9/2020	23.44	6.9	118.6
SC03	7/8/2020	18.32	7.97	3.15
SC03	7/9/2020	22.26	7.52	17.7
SC04	7/9/2020	23.1	7.64	15.56
SC05	7/9/2020	24.21	7.93	11.56
SC06	7/9/2020	24.71	7.88	20
SC07	7/14/2020	22.91	8.08	0.879
SC07	7/15/2020	24.34	7.86	1.3
SC07	7/30/2020	25.33	8.12	3.05
SC07	8/4/2020	28.21	8.33	0.14
SC07	8/11/2020	22.49	8.06	0.25
SC07	8/20/2020	25.43	8.29	0.25
SC07	8/25/2020	25.21	8.14	0.43
SC07	9/3/2020	26.37	8.4	0.18
SC07	9/9/2020	18.31	8.11	0.065
SC07	9/17/2020	20.08	8.16	0.22
SC07	9/23/2020	18.95	8.03	0.14
SC08	7/14/2020	23.78	8.27	1.01
SC08	7/15/2020	24.47	8.27	0.91
SC08	7/30/2020	24.68	8.36	0.2
SC08	8/4/2020	28.01	8.5	0.37
SC08	8/11/2020	22.2	8.22	1.63
SC08	8/20/2020	24.12	8.25	0.43
SC08	8/25/2020	24.03	8.26	0.11
SC08	9/3/2020	24.37	8.39	0.1
SC08	9/9/2020	17.11	8.24	0.031
SC08	9/17/2020	19.97	8.23	0.12
SC08	9/23/2020	18.72	8.23	0.48

Table A3. 2020 Ammonia sampling results (continued)

SC09	7/14/2020	23.29	8.25	0.916
SC09	7/15/2020	24.47	8.36	0.86
SC09	7/30/2020	24.41	8.13	0.49
SC09	8/4/2020	28.76	8.41	0.7
SC09	8/11/2020	20.21	7.91	0.27
SC09	8/20/2020	24.21	8.06	0.56
SC09	8/25/2020	23.24	8.16	0.16
SC09	9/3/2020	25.18	8.36	0.17
SC09	9/9/2020	17.89	8.11	0.072
SC09	9/17/2020	19.84	7.89	0.01
SC09	9/23/2020	19.3	7.92	0.11
SC10	7/30/2020	24.62	8.28	0.92
SC10	8/4/2020	27.87	8.45	0.58
SC10	8/11/2020	21.8	7.96	1.13
SC10	8/20/2020	23.93	8.16	0.89
SC10	8/25/2020	24.36	8.18	0.74
SC10	9/3/2020	26.3	8.41	0.18
SC10	9/9/2020	18.68	8.25	0.012
SC10	9/17/2020	20.54	8.24	0.14
SC10	9/23/2020	18.73	8.18	0.64
SC11	7/30/2020	24.64	8.25	0.63
SC11	8/4/2020	28.83	8.24	0.21
SC11	8/11/2020	21.39	7.93	0.72
SC11	8/20/2020	23.66	8.1	0.52
SC11	8/25/2020	24.1	8.12	0.81
SC11	9/3/2020	26.25	8.38	0.18
SC11	9/9/2020	18.45	8.21	0.008
SC11	9/17/2020	20.58	8.22	0.39
SC11	9/23/2020	18.95	8.1	0.34
SC12	7/30/2020	24.6	8.32	0.29
SC12	8/4/2020	28.66	8.33	0.18
SC12	8/11/2020	22.24	8.02	0.38
SC12	8/20/2020	23.9	8.14	0.73
SC12	8/25/2020	24.47	8.19	0.12
SC12	9/3/2020	26.07	8.4	0.23
SC12	9/9/2020	18.28	8.09	0.003
SC12	9/17/2020	20.03	8.11	0.09
SC12	9/23/2020	19.98	8.02	0.13
SC13	7/30/2020	24.66	8.36	0.28
SC13	8/4/2020	28.73	8.19	0.68
SC13	8/11/2020	21.44	7.77	0.43
SC13	8/20/2020	23.82	8.89	0.61
SC13	8/25/2020	23.36	8.04	0.14
SC13	9/3/2020	25.5	8.33	0.27
SC13	9/9/2020	17.83	8.08	0.001
SC13	9/17/2020	19.72	7.65	0.04
SC13	9/23/2020	18.57	7.67	0.21

Temperature and pH were used to determine whether ammonia levels were at or near chronic and acute levels as stated in EPA Aquatic Life Ambient Quality Criteria for Ammonia, Tables N.4 and 6. However, since these tables are for habitats where unionid mussels (a species for which the EPA created more stringent guidelines in freshwater systems) are present, it is more stringent than necessary for our site. Ammonia concentrations and applicable instantaneous criteria from the table were used to determine optimal surface water diversion manifold placement.

On September 1, personnel were able to have a phone meeting with Chris Bittner, the standards coordinator for Utah Department of Environmental Quality (DEQ). Per his recommendation, the way that the criteria for chronic ammonia is calculated was adjusted to better represent averages as the EPA describes. As advised by DEQ, the procedure has been adjusted to calculate the chronic criteria as an average of all the derived chronic criteria for that month.

Once four sampling events are concluded in a month, a monthly average chronic criteria can be calculated by averaging the four chronic criteria (at each location). To determine what level is not to be exceeded, you must multiply the average by 2.5 to get the four day limit (Table A4). This four day limit represented the new chronic criteria for the site, which was sufficiently stringent for our site due to the absence of unionid mussels. Table A4 presents how our criteria was calculated for the 2020 season.

"The 30-day averaging period for chronic effects has been retained from the 1999 chronic criterion, as is the restriction that the highest 4-day average within the 30 days may be no greater than 2.5 times the chronic concentration (CCC) more than once every three years on average"

Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater 2013; EPA 822-R-18-002

On October 1, the diversion water was turned off and the manifolds were removed from this area. In total, during 2020 the surface water diversion system applied 14,195,995 gallons of fresh water into the habitat between June 22 and October 1.

Table A4. Monthly ammonia averages for 2020 season

SC09	Temperature	pH	Ammonia	Acute Limit	Chronic Limit
7/14/20	23.29	8.25	0.916	5.6	0.47
7/15/2020	24.47	8.36	0.86	4.2	0.32
7/30/2020	24.41	8.13	0.49	6.2	0.52
8/4/2020	28.76	8.41	0.7	1.6	0.23
8/11/2020	20.21	7.91	0.27	11	0.89
8/20/2020	24.21	8.06	0.56	6.2	0.52
8/25/2020	23.24	8.16	0.16	5.6	0.47
9/3/2020	25.18	8.36	0.17	3.2	0.3
9/9/2020	17.89	8.11	0.072	7.3	0.76
9/17/2020	19.84	7.89	0.01	11	0.89
9/23/2020	19.3	7.92	0.11	11	0.95

July Chronic Average	0.436667
Four Day Limit	1.091667
August Chronic Average	0.5275
Four Day Limit	1.31875
September Chronic Average	0.725
Four Day Limit	1.8125

Appendix A. September 2020 Habitat CF4, and CF5 Sampling Event *(continued)*
Water Sampling Field Activities Verification

Sampling Event/RIN	September 2020 Habitat, CF4, and CF5 Sampling Event/RIN 2009122	**Date(s) of Water Sampling**	September 22 - 28, 2020
Date(s) of Verification	April 22, 2021	**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?	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	
10. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 milliliters per minute?	NA	
Was one pump/tubing volume removed before sampling?	NA	
11. Were duplicates taken at a frequency of one per 20 samples?	Yes	A duplicate was collected from location 0814, given false ID of 2000.

Sampling Event/RIN	September 2020 Habitat, CF4, and CF5 Sampling Event/RIN 2009122	**Date(s) of Water Sampling**	September 22 - 28, 2020
Date(s) of Verification	April 22, 2021	**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	All samples 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?	Yes	
Was the true identity of the samples recorded on the quality assurance sample log?	Yes	
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?	Yes	
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 A. September 2020 Habitat, CF4, and CF5 Sampling Event *(continued)*
Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 2009122
Comparison: All Historical Data
Report Date: 4/21/2021 4:26 PM

				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	0814	09/28/2020	Ammonia Total as N	130			900		J	140			29	0

Note: All concentrations in mg/L

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 compound (TIC).
P > 25% difference in detected pesticide or Aroclor 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.

Appendix A. September 2020 Habitat, CF4, and 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: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/22/2020	0001	28.00	310		J	#	20	-
Oxidation Reduction Potential	mV	09/22/2020	N001	28.00	2			#	-	-
pH	s.u.	09/22/2020	N001	28.00	7.24			#	-	-
Specific Conductance	umhos/cm	09/22/2020	N001	28.00	18841			#	-	-
Temperature	C	09/22/2020	N001	28.00	14.66			#	-	-
Turbidity	NTU	09/22/2020	N001	28.00	2.89			#	-	-
Uranium	mg/L	09/22/2020	0001	28.00	2.400		J	#	0.00012	-

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

LOCATION: 0781 <well> Configuration 4

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/22/2020	0001	46.00	1500		J	#	100	-
Oxidation Reduction Potential	mV	09/22/2020	N001	46.00	40			#	-	-
pH	s.u.	09/22/2020	N001	46.00	7.00			#	-	-
Specific Conductance	umhos/cm	09/22/2020	N001	46.00	84311			#	-	-
Temperature	C	09/22/2020	N001	46.00	15.42			#	-	-
Turbidity	NTU	09/22/2020	N001	46.00	2.37			#	-	-
Uranium	mg/L	09/22/2020	0001	46.00	1.900		J	#	0.00012	-

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

LOCATION: 0782 <well> Configuration 4

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/22/2020	0001	33.00	440		J	#	100	-
Oxidation Reduction Potential	mV	09/22/2020	N001	33.00	28			#	-	-
pH	s.u.	09/22/2020	N001	33.00	7.15			#	-	-
Specific Conductance	umhos/cm	09/22/2020	N001	33.00	22777			#	-	-
Temperature	C	09/22/2020	N001	33.00	15.05			#	-	-
Turbidity	NTU	09/22/2020	N001	33.00	4.84			#	-	-
Uranium	mg/L	09/22/2020	0001	33.00	2.700		J	#	0.00012	-

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

LOCATION: 0783 <well> Configuration 4

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/23/2020	0001	18.00	4.1		J	#	0.2	-
Oxidation Reduction Potential	mV	09/23/2020	N001	18.00	-59			#	-	-
pH	s.u.	09/23/2020	N001	18.00	7.66			#	-	-
Specific Conductance	umhos/cm	09/23/2020	N001	18.00	3132			#	-	-
Temperature	C	09/23/2020	N001	18.00	14.79			#	-	-
Turbidity	NTU	09/23/2020	N001	18.00	3.84			#	-	-
Uranium	mg/L	09/23/2020	0001	18.00	0.250		J	#	1.2E-05	-

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

LOCATION: 0784 <well> Configuration 4

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/23/2020	0001	18.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	09/23/2020	N001	18.00	-138			#	-	-
pH	s.u.	09/23/2020	N001	18.00	7.79			#	-	-
Specific Conductance	umhos/cm	09/23/2020	N001	18.00	1655			#	-	-
Temperature	C	09/23/2020	N001	18.00	17.28			#	-	-
Turbidity	NTU	09/23/2020	N001	18.00	4.02			#	-	-
Uranium	mg/L	09/23/2020	0001	18.00	0.013		J	#	1.2E-05	-

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

LOCATION: 0785 <well> Configuration 4

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/23/2020	0001	18.00	3		J	#	0.2	-
Oxidation Reduction Potential	mV	09/23/2020	N001	18.00	-8			#	-	-
pH	s.u.	09/23/2020	N001	18.00	7.08			#	-	-
Specific Conductance	umhos/cm	09/23/2020	N001	18.00	9233			#	-	-
Temperature	C	09/23/2020	N001	18.00	16.68			#	-	-
Turbidity	NTU	09/23/2020	N001	18.00	8.48			#	-	-
Uranium	mg/L	09/23/2020	0001	18.00	0.470		J	#	1.2E-05	-

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

LOCATION: 0786 <well> Configuration 4

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/23/2020	0001	28.00	500		J	#	100	-
Oxidation Reduction Potential	mV	09/23/2020	N001	28.00	24			#	-	-
pH	s.u.	09/23/2020	N001	28.00	7.03			#	-	-
Specific Conductance	umhos/cm	09/23/2020	N001	28.00	25369			#	-	-
Temperature	C	09/23/2020	N001	28.00	15.99			#	-	-
Turbidity	NTU	09/23/2020	N001	28.00	0.82			#	-	-
Uranium	mg/L	09/23/2020	0001	28.00	2.700		J	#	0.00012	-

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

LOCATION: 0787 <well> Configuration 4

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/23/2020	0001	36.00	1900		J	#	100	-
Oxidation Reduction Potential	mV	09/23/2020	N001	36.00	41			#	-	-
pH	s.u.	09/23/2020	N001	36.00	6.96			#	-	-
Specific Conductance	umhos/cm	09/23/2020	N001	36.00	77384			#	-	-
Temperature	C	09/23/2020	N001	36.00	16.45			#	-	-
Turbidity	NTU	09/23/2020	N001	36.00	1.64			#	-	-
Uranium	mg/L	09/23/2020	0001	36.00	2.200		J	#	0.00012	-

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

LOCATION: 0810 <well, extraction well> Configuration 5

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/28/2020	0001	35.00	330		J	#	20	-
Oxidation Reduction Potential	mV	09/28/2020	N001	35.00	30			#	-	-
pH	s.u.	09/28/2020	N001	35.00	6.98			#	-	-
Specific Conductance	umhos/cm	09/28/2020	N001	35.00	29736			#	-	-
Temperature	C	09/28/2020	N001	35.00	17.18			#	-	-
Turbidity	NTU	09/28/2020	N001	35.00	19.10			#	-	-
Uranium	mg/L	09/28/2020	0001	35.00	2.700		J	#	0.00012	-

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

LOCATION: 0811 <well, extraction well> Configuration 5

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/28/2020	0001	35.00	350		J	#	20	-
Oxidation Reduction Potential	mV	09/28/2020	N001	35.00	31			#	-	-
pH	s.u.	09/28/2020	N001	35.00	7.01			#	-	-
Specific Conductance	umhos/cm	09/28/2020	N001	35.00	20853			#	-	-
Temperature	C	09/28/2020	N001	35.00	17.11			#	-	-
Turbidity	NTU	09/28/2020	N001	35.00	7.46			#	-	-
Uranium	mg/L	09/28/2020	0001	35.00	2.500		J	#	0.00012	-

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

LOCATION: 0812 <well, extraction well> Configuration 5

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/28/2020	0001	40.00	380		J	#	20	-
Oxidation Reduction Potential	mV	09/28/2020	N001	40.00	43			#	-	-
pH	s.u.	09/28/2020	N001	40.00	6.98			#	-	-
Specific Conductance	umhos/cm	09/28/2020	N001	40.00	17181			#	-	-
Temperature	C	09/28/2020	N001	40.00	16.64			#	-	-
Turbidity	NTU	09/28/2020	N001	40.00	1.00			#	-	-
Uranium	mg/L	09/28/2020	0001	40.00	2.000		J	#	0.00012	-

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

LOCATION: 0813 <well, extraction well> Configuration 5

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/28/2020	0001	40.00	240		J	#	20	-
Oxidation Reduction Potential	mV	09/28/2020	N001	40.00	34			#	-	-
pH	s.u.	09/28/2020	N001	40.00	6.96			#	-	-
Specific Conductance	umhos/cm	09/28/2020	N001	40.00	14008			#	-	-
Temperature	C	09/28/2020	N001	40.00	19.57			#	-	-
Turbidity	NTU	09/28/2020	N001	40.00	0.58			#	-	-
Uranium	mg/L	09/28/2020	0001	40.00	1.600		J	#	0.00012	-

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

LOCATION: 0814 <well, extraction well> Configuration 5

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/28/2020	0001	40.00	140	N	J	#	20	-
Ammonia Total as N	mg/L	09/28/2020	0002	40.00	130		J	#	20	-
Oxidation Reduction Potential	mV	09/28/2020	N001	40.00	23			#	-	-
pH	s.u.	09/28/2020	N001	40.00	7.04			#	-	-
Specific Conductance	umhos/cm	09/28/2020	N001	40.00	22425			#	-	-
Temperature	C	09/28/2020	N001	40.00	17.80			#	-	-
Turbidity	NTU	09/28/2020	N001	40.00	0.96			#	-	-
Uranium	mg/L	09/28/2020	0001	40.00	2.700		J	#	0.00012	-
Uranium	mg/L	09/28/2020	0002	40.00	2.700		J	#	0.00012	-

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

LOCATION: 0815 <well, extraction well> Configuration 5

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/28/2020	0001	45.00	150		J	#	20	-
Oxidation Reduction Potential	mV	09/28/2020	N001	45.00	34			#	-	-
pH	s.u.	09/28/2020	N001	45.00	7.06			#	-	-
Specific Conductance	umhos/cm	09/28/2020	N001	45.00	24465			#	-	-
Temperature	C	09/28/2020	N001	45.00	17.00			#	-	-
Turbidity	NTU	09/28/2020	N001	45.00	1.45			#	-	-
Uranium	mg/L	09/28/2020	0001	45.00	2.900		J	#	0.00012	-

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

LOCATION: 0816 <well, extraction well> Configuration 5

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/28/2020	0001	45.00	130		J	#	20	-
Oxidation Reduction Potential	mV	09/28/2020	N001	45.00	35			#	-	-
pH	s.u.	09/28/2020	N001	45.00	7.03			#	-	-
Specific Conductance	umhos/cm	09/28/2020	N001	45.00	23021			#	-	-
Temperature	C	09/28/2020	N001	45.00	16.96			#	-	-
Turbidity	NTU	09/28/2020	N001	45.00	1.98			#	-	-
Uranium	mg/L	09/28/2020	0001	45.00	2.500		J	#	0.00012	-

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

LOCATION: SC08 <surface location, river> Second Channel (SC) out from Configuration 4, on eastern bank at the confluence with the main channel.

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/23/2020	0001	0.00 - 0.00	0.24		J	#	0.2	-
Oxidation Reduction Potential	mV	09/23/2020	N001	0.00 - 0.00	24			#	-	-
pH	s.u.	09/23/2020	N001	0.00 - 0.00	8.23			#	-	-
Specific Conductance	umhos/cm	09/23/2020	N001	0.00 - 0.00	1393			#	-	-
Temperature	C	09/23/2020	N001	0.00 - 0.00	18.72			#	-	-
Turbidity	NTU	09/23/2020	N001	0.00 - 0.00	96.30			#	-	-

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

LOCATION: SC11 <surface location, river> Second Channel (SC) out from Configuration 4, on eastern shore in from main channel and north of confluence.

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/23/2020	0001	0.00 - 0.00	0.2	U		#	0.2	-
Oxidation Reduction Potential	mV	09/23/2020	N001	0.00 - 0.00	40			#	-	-
pH	s.u.	09/23/2020	N001	0.00 - 0.00	8.10			#	-	-
Specific Conductance	umhos/cm	09/23/2020	N001	0.00 - 0.00	1395			#	-	-
Temperature	C	09/23/2020	N001	0.00 - 0.00	18.95			#	-	-
Turbidity	NTU	09/23/2020	N001	0.00 - 0.00	15.10			#	-	-

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

LOCATION: SC12 <surface location, river> Second Channel (SC) out from Configuration 4, upstream from first channel confluence.

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/23/2020	0001	0.00 - 0.00	0.2	U		#	0.2	-
Oxidation Reduction Potential	mV	09/23/2020	N001	0.00 - 0.00	60			#	-	-
pH	s.u.	09/23/2020	N001	0.00 - 0.00	8.02			#	-	-
Specific Conductance	umhos/cm	09/23/2020	N001	0.00 - 0.00	1387			#	-	-
Temperature	C	09/23/2020	N001	0.00 - 0.00	18.98			#	-	-
Turbidity	NTU	09/23/2020	N001	0.00 - 0.00	14.20			#	-	-

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

LOCATION: SC13 <surface location, river> Second Channel (SC) out from Configuration 4 along western shore south of confluence of first channel.

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/23/2020	0001	0.00 - 0.00	0.2	U		#	0.2	-
Oxidation Reduction Potential	mV	09/23/2020	N001	0.00 - 0.00	108			#	-	-
pH	s.u.	09/23/2020	N001	0.00 - 0.00	7.67			#	-	-
Specific Conductance	umhos/cm	09/23/2020	N001	0.00 - 0.00	1306			#	-	-
Temperature	C	09/23/2020	N001	0.00 - 0.00	18.57			#	-	-
Turbidity	NTU	09/23/2020	N001	0.00 - 0.00	25.90			#	-	-

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

LOCATION: SMI-PW02 <well>

REPORT DATE: 4/21/2021 3:36 PM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	09/28/2020	0001	55.00	390		J	#	20	-
Oxidation Reduction Potential	mV	09/28/2020	N001	55.00	86			#	-	-
pH	s.u.	09/28/2020	N001	55.00	6.72			#	-	-
Specific Conductance	umhos/cm	09/28/2020	N001	55.00	29408			#	-	-
Temperature	C	09/28/2020	N001	55.00	16.36			#	-	-
Turbidity	NTU	09/28/2020	N001	55.00	1.63			#	-	-
Uranium	mg/L	09/28/2020	0001	55.00	2.800		J	#	0.00012	-

RECORDS: SELECTED FROM USEE105 WHERE RIN = '1907116' AND (DataValidationQualifiers IS NULL OR (DataValidationQualifiers NOT LIKE '%N%' AND DataValidationQualifiers NOT LIKE '%R%' AND DataValidationQualifiers NOT LIKE '%X%'))

Appendix A. September 2020 Habitat, CF4, and CF5 Sampling Event *(continued)*
Water Quality Data *(continued)*

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 compound (TIC).
P	> 25% difference in detected pesticide or Aroclor 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. September 2020 Habitat, CF4, and CF5 Sampling Event (*continued*)

Water Level Data

STATIC WATER LEVELS (USEE700) FOR SITE CJ

REPORT DATE: 11/24/2020

Location Code	Flow Code	Ground Surface Elevation (Ft)	Measurement Date Time	Depth From Top of Casing (Ft)	Approximate Water Elevation (MSL)	Water Level Flag
0780		3968.45	9/22/2020	16.83	3951.62	
0781		3968.56	9/22/2020	15.48	3953.08	
0782		3968.46	9/22/2020	16.7	3951.76	
0783		3966.16	9/23/2020	14.78	3951.38	
0784		3968.73	9/23/2020	16.67	3952.06	
0785		3969.24	9/23/2020	17.1	3952.14	
0786		3968.14	9/23/2020	16.49	3951.65	
0787		3968.43	9/23/2020	16.57	3951.86	

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

Date: March 25, 2021
To: Ken Pill
From: James Ritchey
Subject: September 2020 Habitat, CF4, and CF5 Sampling Event

Site: Moab
Date of Sampling Event: September 22 – 28, 2020
Team Members: N. Andrews and J. Ritchey
RIN Number Assigned: All samples were assigned to RIN 2009122
Sample Shipment: One sample coolers was shipped overnight UPS to ALS Laboratory from Moab, Utah on October 1, 2020 (Tracking number 1Z5W1Y510195207061).

September 2020 Configuration 4 Sampling

Number of Locations Sampled: Eight observation wells (0780, 0781, 0782, 0783, 0784, 0785, 0786, and 0787) were sampled during the September 2020 Sampling Event. Also, four surface water samples were collected of the bank of the CF4 area (SC08, SC11, SC12 and SC13) in correlation with surface water and habitat monitoring.

Locations Not Sampled: None.

Field Variance: None.

Quality Control Sample Cross Reference: None.

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	9/22/2020	15:40	16.83	28
0781	9/22/2020	15:55	15.48	46
0782	9/22/2020	16:05	16.70	32
0783	9/23/2020	10:25	14.78	18
0784	9/23/2020	10:45	16.67	18
0785	9/23/2020	11:00	17.10	18
0786	9/23/2020	11:30	16.49	28
0787	9/23/2020	11:45	16.57	36

Location Specific Information – Surface Water Locations: All surface water locations were sampled using an open container. Samples were then filtered and preserved in the lab.

Location	Date	Time	Depth to Water (ft btoc)	Sample Depth (ft bgs)
SC08	9/23/2020	8:50	NA	NA
SC11	9/23/2020	8:45	NA	NA
SC12	9/23/2020	8:35	NA	NA
SC13	9/23/2020	8:30	NA	NA

September 2020 Configuration 5 Sampling

Number of Locations Sampled: Eight extraction wells (0810, 0811, 0812, 0813, 0814, 0815, 0816, and SMI-PW02) and one duplicate were sampled during the September 2020 Monthly 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	0814	Duplicate from 12.4 - 42.4 ft bgs	Ground Water	SEP 019

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	Screen Interval (ft bgs)	Pump Intake Depth (ft bgs)
0810	9/28/2020	14:30	10.4 – 40.4	35
0811	9/28/2020	15:00	8.6 – 38.6	35
0812	9/28/2020	12:05	14.2 – 44.2	40
0813	9/28/2020	12:20	14.4 – 44.4	40
0814	9/28/2020	14:10	12.4 – 42.4	40
0815	9/28/2020	13:55	21.7 – 51.7	45
0816	9/28/2020	12:30	20.9 – 50.9	45
SMI-PW02	9/28/2020	11:50	20.0 – 60.0	55

*Depths to water were not collected for wells.

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)
9/22/2020	2,650
9/23/2020	2,620
9/24/2020	2,580
9/25/2020	2,550
9/26/2020	2,500
9/27/2020	2,440
9/28/2020	2,490

Equipment Issues: None.

Corrective Action Required/Taken: None.

Appendix B.
December 2020 Crescent Junction Sampling Event

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

Appendix B. December 2020 Crescent Junction Sampling Event
Water Sampling Field Activities Verification

Sampling Event/RIN	December 2020 CJ Sampling Event /2012123	**Date(s) of Water Sampling**	December 8, 2020
Date(s) of Verification	April 22, 2021	**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?	Yes	
7.	Were the following conditions met when purging a Category I well: Was one pump/tubing volume purged before sampling?	NA	
	Did the water level stabilize before sampling?	NA	
	Did pH, specific conductance, and turbidity measurements stabilize before sampling?	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	
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 proper frequency?	Yes	Only two samples were collected, duplicate was not required

Appendix B. December 2020 Crescent Junction Sampling Event *(continued)*
Water Sampling Field Activities Verification (*continued*)

Sampling Event/RIN	December 2020 CJ Sampling Event /2012123	**Date(s) of Water Sampling**	December 8, 2020
Date(s) of Verification	April 22, 2021	**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?	NA	
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 B. December 2020 Crescent Junction Sampling Event *(continued)*
Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 2012123
Comparison: All Historical Data
Report Date: 4/21/2021 4:26 PM

				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	0202	12/08/2020	Ammonia Total as N	11			17			14			5	0
CRJ01	0202	12/08/2020	Calcium	440			410			200			5	0
CRJ01	0202	12/08/2020	Magnesium	810			730			94		LQ	5	0
CRJ01	0202	12/08/2020	Manganese	0.55			0.51			0.017	B		5	0
CRJ01	0202	12/08/2020	Total Dissolved Solids	22000			39000			24000			5	0
CRJ01	0202	12/08/2020	Uranium	0.029			0.028			0.00041		LQ	5	1
CRJ01	0205	12/08/2020	BICARBONATE AS CaCO3	890			1100			950			12	0
CRJ01	0205	12/08/2020	TOTAL ALKALINITY AS CaCO3	890			1100			950			12	0
CRJ01	0205	12/08/2020	Total Dissolved Solids	19000			48000			21000			15	0
CRJ01	0205	12/08/2020	Uranium	0.043			0.037			2.9E-05	U		16	3
CRJ01	0205	12/08/2020	Uranium-234	63	M3		35.7			27.1			9	0
CRJ01	0205	12/08/2020	Uranium-238	14.3	M3		12.2			9.2			9	0

Note: All concentrations in mg/L, with the exception of U-234 and U-238 (pCi/L).

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 compound (TIC).
P > 25% difference in detected pesticide or Aroclor 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.

Appendix B. December 2020 Crescent Junction Sampling Event *(continued)*
Water Quality Data

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE CRJ01, Crescent Junction Site

LOCATION: 0202 <well>

REPORT DATE: 11/19/2020 1:16 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	12/08/2020	0001	60.00	11		J	#	2	-
Arsenic	mg/L	12/08/2020	0001	60.00	0.039	U	J	#	0.039	-
BICARBONATE AS CaCO3	mg/L	12/08/2020	0001	60.00	1100		J	#	20	-
BORON	ug/L	12/08/2020	0001	60.00	1500		J	#	31	-
Bromide	mg/L	12/08/2020	0001	60.00	20	U	J	#	20	-
Cadmium	mg/L	12/08/2020	0001	60.00	0.0033	U	J	#	0.0033	-
Calcium	mg/L	12/08/2020	0001	60.00	440.000		J	#	0.12	-
CARBONATE AS CaCO3	mg/L	12/08/2020	0001	60.00	20	U	J	#	20	-
Chloride	mg/L	12/08/2020	0001	60.00	6900		J	#	100	-
Chromium	mg/L	12/08/2020	0001	60.00	0.0051	U	J	#	0.0051	-
Copper	mg/L	12/08/2020	0001	60.00	0.0097	U	J	#	0.0097	-
Fluoride	mg/L	12/08/2020	0001	60.00	10	U	J	#	10	-
Iron	mg/L	12/08/2020	0001	60.00	0.049	U	J	#	0.049	-
Lead	mg/L	12/08/2020	0001	60.00	0.013	U	J	#	0.013	-
Magnesium	mg/L	12/08/2020	0001	60.00	810.000		J	#	0.13	-
Manganese	mg/L	12/08/2020	0001	60.00	0.550		J	#	0.0011	-
MOLYBDENUM	ug/L	12/08/2020	0001	60.00	11	U	J	#	11	-
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2020	0001	60.00	500		J	#	10	-

Appendix B. December 2020 Crescent Junction Sampling Event *(continued)*
Water Quality Data *(continued)*

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	12/08/2020	N001	60.00	92			#	-	-
pH	s.u.	12/08/2020	N001	60.00	6.55			#	-	-
Potassium	mg/L	12/08/2020	0001	60.00	90.000		J	#	1.1	-
Selenium	mg/L	12/08/2020	0001	60.00	0.027	U	J	#	0.027	-
Sodium	mg/L	12/08/2020	0001	60.00	10000.000		J	#	0.66	-
Specific Conductance	umhos/cm	12/08/2020	N001	60.00	45078			#	-	-
Sulfate	mg/L	12/08/2020	0001	60.00	19000		J	#	200	-
Temperature	C	12/08/2020	N001	60.00	13.99			#	-	-
TOTAL ALKALINITY AS CaCO3	mg/L	12/08/2020	0001	60.00	1100		J	#	20	-
Total Dissolved Solids	mg/L	12/08/2020	0001	60.00	22000		J	#	1000	-
Turbidity	NTU	12/08/2020	N001	60.00	5.64			#	-	-
Uranium	mg/L	12/08/2020	0001	60.00	0.029		J	#	1.2E-05	-
Uranium-234	pCi/L	12/08/2020	0001	60.00	41.8	M3	J	#	0.2	±7.30
Uranium-235	pCi/L	12/08/2020	0001	60.00	0.95	M3	J	#	0.22	±0.39
Uranium-238	pCi/L	12/08/2020	0001	60.00	9	M3	J	#	0.2	±1.80

Appendix B. December 2020 Crescent Junction Sampling Event *(continued)*
Water Quality Data *(continued)*

GENERAL WATER QUALITY DATA BY LOCATION (USEE105) FOR SITE CRJ01, Crescent Junction Site

LOCATION: 0205 <well>

REPORT DATE: 11/19/2020 1:16 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	12/08/2020	0001	68.00	15			#	2	-
Arsenic	mg/L	12/08/2020	0001	68.00	0.039	U	J	#	0.039	-
BICARBONATE AS CaCO3	mg/L	12/08/2020	0001	68.00	890		J	#	20	-
BORON	ug/L	12/08/2020	0001	68.00	1300		J	#	31	-
Bromide	mg/L	12/08/2020	0001	68.00	20	U	J	#	20	-
Cadmium	mg/L	12/08/2020	0001	68.00	0.0033	U	J	#	0.0033	-
Calcium	mg/L	12/08/2020	0001	68.00	350.000		J	#	0.12	-
CARBONATE AS CaCO3	mg/L	12/08/2020	0001	68.00	20	U	J	#	20	-
Chloride	mg/L	12/08/2020	0001	68.00	4400		J	#	50	-
Chromium	mg/L	12/08/2020	0001	68.00	0.0051	U	J	#	0.0051	-
Copper	mg/L	12/08/2020	0001	68.00	0.0097	U	J	#	0.0097	-
Fluoride	mg/L	12/08/2020	0001	68.00	10	U	J	#	10	-
Iron	mg/L	12/08/2020	0001	68.00	0.049	U	J	#	0.049	-
Lead	mg/L	12/08/2020	0001	68.00	0.013	U	J	#	0.013	-
Magnesium	mg/L	12/08/2020	0001	68.00	1000.000		J	#	0.13	-
Manganese	mg/L	12/08/2020	0001	68.00	0.310		J	#	0.0011	-
MOLYBDENUM	ug/L	12/08/2020	0001	68.00	11	U	J	#	11	-
Nitrate + Nitrite as Nitrogen	mg/L	12/08/2020	0001	68.00	530		J	#	10	-

Appendix B. December 2020 Crescent Junction Sampling Event *(continued)*
Water Quality Data *(continued)*

UNITS	PARAMETER	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Oxidation Reduction Potential	mV	12/08/2020	N001	68.00	23			#	-	-
pH	s.u.	12/08/2020	N001	68.00	7.09			#	-	-
Potassium	mg/L	12/08/2020	0001	68.00	70.000		J	#	1.1	-
Selenium	mg/L	12/08/2020	0001	68.00	2.500		J	#	0.027	-
Sodium	mg/L	12/08/2020	0001	68.00	9700.000		J	#	0.66	-
Specific Conductance	umhos/cm	12/08/2020	N001	68.00	42646			#	-	-
Sulfate	mg/L	12/08/2020	0001	68.00	23000		J	#	250	-
Temperature	C	12/08/2020	N001	68.00	14.52			#	-	-
TOTAL ALKALINITY AS CaCO3	mg/L	12/08/2020	0001	68.00	890		J	#	20	-
Total Dissolved Solids	mg/L	12/08/2020	0001	68.00	19000		J	#	1000	-
Turbidity	NTU	12/08/2020	N001	68.00	9.33			#	-	-
Uranium	mg/L	12/08/2020	0001	68.00	0.043		J	#	1.2E-05	-
Uranium-234	pCi/L	12/08/2020	0001	68.00	63	M3	J	#	-	±11.00
Uranium-235	pCi/L	12/08/2020	0001	68.00	1.16	M3	J	#	0.2	±0.45
Uranium-238	pCi/L	12/08/2020	0001	68.00	14.3	M3	J	#	0.3	±2.70

Appendix B. December 2020 Crescent Junction Sampling Event *(continued)*
Water Quality Data *(continued)*

RECORDS: SELECTED FROM USEE105 WHERE RIN = '1909117' 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 compound (TIC).
- P > 25% difference in detected pesticide or Aroclor 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 B. December 2020 Crescent Junction Sampling Event *(continued)*
Water Level Data

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

REPORT DATE: 4/22/2021 8:20 AM

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
0202	O	4960.0	02/262020		50.56	4909.44	
0205	O	4945.9	02/262020		47.56	4898.34	

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: March 25, 2021
To: Ken Pill
From: James Ritchey
Subject: December 2020 CJ Sampling Event

Site: Crescent Junction – Wells 0202 and 0205
Date of Sampling Event: December 8, 2020
Team Members: N. Andrews, K. Pill, and J. Ritchey
RIN Number Assigned: All samples were assigned to RIN 2012123.
Sample Shipment: The sample was shipped overnight UPS to ALS Laboratory from Moab, Utah on December 11 of 2020 (Tracking number: 1Z5W1Y510192581288).

Number of Locations Sampled: One sample was collected from each well 0202 and 0205 during the December 2020 CJ sampling event.

Locations Not Sampled/Reason: None.

Field Variance: None.

Quality Control Sample Cross Reference: None.

Location Specific Information: Well 0202 and 0205 were sampled using a non-dedicated submersible pump with non-dedicated tubing. The table below provides additional information:

Location	Date	Sample Depth (ft btoc)	Depth to Water (ft btoc)	Comments
0202	12/08/2020	60	50.56	Water has yellow color.
0205	12/08/2020	68	47.56	Water has yellow color.

Notes: ft btoc = feet below top of casing.

Well Inspection Summary: A well inspection was not conducted.

Equipment: None.

Regulatory: None.

Site Issues: None.

Corrective Action Required/Taken: None.

Appendix C.
December 2020 – February 2021 Site-wide Sampling Event

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

Appendix C. December 2020 – February 2021 Site-wide Sampling Event
Water Sampling Field Activities Verification

Sampling Event/RIN	Dec 2020 – Feb 2021 Site-wide Sampling Event/2012124	**Date(s) of Water Sampling**	Dec 14, 2020 – Feb 25, 2021
Date(s) of Verification	April 22, 2021	**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?	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?	NA	
8. Were the following conditions met when purging a Category II well:		
Was the flow rate less than 500 milliliters per minute?	Yes	
Was one pump/tubing volume removed before sampling?	Yes	
9. Were duplicates taken at a frequency of one per 20 samples?	Yes	Five duplicates were collected for this sampling event.

Appendix C. December 2020 – February 2021 Site-wide Sampling Event *(continued)*
Water Sampling Field Activities Verification *(continued)*

Sampling Event/RIN	Dec 2020 – Feb 2021 Site-wide Sampling Event/2012124	**Date(s) of Water Sampling**	Dec 14, 2020 – Feb 25, 2021
Date(s) of Verification	April 22, 2021	**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 7 surface water samples, all other samples were collected using dedicated equipment. (location 2003)
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 SMI-PZ1D2 (2000), 0407 (2001), 0492 (2002), UPD-24 (2004), and 0433 (2005)
Was the true identity of the samples recorded on the quality assurance sample log?	Yes	
13. Were samples collected in the containers specified?	Yes	
14. Were samples filtered and preserved as specified?	Yes	
15. Were the number and types of samples collected as specified?	Yes	
16. Were COC records completed, and was sample custody maintained?	Yes	
17. Are field data sheets signed and dated by both team members?	Yes	
18. Was all other pertinent information documented on the field data sheets?	Yes	
19. Was the presence or absence of ice in the cooler documented at every sample location?	Yes	
20. Were water levels measured at the locations specified in the planning documents?	Yes	Water levels were measured December 10, 2020, plus just prior to sample collection

Appendix C. December 2020 – February 2021 Site-wide Sampling Event *(continued)*
Minimums and Maximums Report

Data Validation Minimums and Maximums Report - No Field Parameters
Laboratory: ALS
RIN: 2005121
Comparison: All Historical Data
Report Date: 10/27/2020 4:29 PM

				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	0414	02/09/2021	Arsenic	0.016			0.361		F	0.017			5	0
MOA01	0414	02/09/2021	Selenium	0.022			0.205		F	0.045			10	0
MOA01	0434	02/23/2021	Uranium	0.028			0.027			0.0149		F	18	0
MOA01	0436	02/11/2021	Ammonia Total as N	2.4			950			2.9			18	0
MOA01	0440	02/24/2021	Selenium	0.067			0.064			0.034		J	9	0
MOA01	ATP-1-D	01/05/2021	Ammonia Total as N	8.5			4			3.3			5	0
MOA01	ATP-1-ID	01/05/2021	Ammonia Total as N	4.9			4.1			3.4			5	0
MOA01	ATP-1-ID	01/05/2021	Uranium	2E-05	J		0.00227			2.9E-05	U		7	3
MOA01	ATP-1-IS	01/07/2021	Uranium	2E-05	J		0.00199			2.9E-05	U		5	2
MOA01	ATP-1-S	01/07/2021	Ammonia Total as N	3	N		4.62			3.106		F	8	0
MOA01	ATP-1-S	01/07/2021	Arsenic	0.00075	J		0.1	U		0.001			28	13
MOA01	ATP-2-S	12/15/2020	Ammonia Total as N	56			1130			57			52	0
MOA01	ATP-2-S	12/15/2020	Selenium	0.00085	J		0.5	U		0.0009	J		64	21
MOA01	CR1	01/27/2021	Ammonia Total as N	1.6			1	U		0.003	U	J	56	47
MOA01	CR1	01/27/2021	Uranium	0.048			0.008			0.0013			56	1
MOA01	MW-3	01/05/2021	Ammonia Total as N	250			1190			330			23	0
MOA01	SMI-MW01	02/09/2021	Uranium	2.5			17.6			2.7			26	0
MOA01	SMI-PZ3M	02/11/2021	Ammonia Total as N	19			97			28			22	0
MOA01	SMI-PZ3S	02/11/2021	Ammonia Total as N	1.7			11.491		F	2.1			31	0

Note: All concentrations in mg/L

Appendix C. December 2020 – February 2021 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 C. December 2020 – February 2021 Site-wide Sampling Event *(continued)*
Blanks Report

Laboratory: ALS
RIN: 2012124
Report Date: 04/22/2012 4:29 PM

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	2003	2/3/2021	0001	mg/L	0.2	U		0.2		E
Uranium	MOA01	2003	2/3/2021	0001	mg/L	0.00011	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: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/27/2021	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	01/27/2021	N001	0.00 - 0.00	55			#	-	-
pH	s.u.	01/27/2021	N001	0.00 - 0.00	7.38			#	-	-
Specific Conductance	umhos/cm	01/27/2021	N001	0.00 - 0.00	1412			#	-	-
Temperature	C	01/27/2021	N001	0.00 - 0.00	1.21			#	-	-
Turbidity	NTU	01/27/2021	N001	0.00 - 0.00	8.25			#	-	-
Uranium	mg/L	01/27/2021	0001	0.00 - 0.00	0.0051		J	#	1.2E-05	-

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

LOCATION: 0218 <surface location, river>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/27/2021	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	01/27/2021	N001	0.00 - 0.00	15			#	-	-
pH	s.u.	01/27/2021	N001	0.00 - 0.00	7.86			#	-	-
Specific Conductance	umhos/cm	01/27/2021	N001	0.00 - 0.00	1407			#	-	-
Temperature	C	01/27/2021	N001	0.00 - 0.00	0.87			#	-	-
Turbidity	NTU	01/27/2021	N001	0.00 - 0.00	4.25			#	-	-
Uranium	mg/L	01/27/2021	0001	0.00 - 0.00	0.0051		J	#	1.2E-05	-

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

LOCATION: 0226 <surface location, river>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/01/2021	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	02/01/2021	N001	0.00 - 0.00	-35			#	-	-
pH	s.u.	02/01/2021	N001	0.00 - 0.00	8.48			#	-	-
Specific Conductance	umhos/cm	02/01/2021	N001	0.00 - 0.00	1450			#	-	-
Temperature	C	02/01/2021	N001	0.00 - 0.00	2.45			#	-	-
Turbidity	NTU	02/01/2021	N001	0.00 - 0.00	17.20			#	-	-
Uranium	mg/L	02/01/2021	0001	0.00 - 0.00	0.0066		J	#	1.2E-05	-

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

LOCATION: 0401 <well> Configuration 2

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/09/2021	0001	18.00	220		J	#	20	-
Oxidation Reduction Potential	mV	02/09/2021	N001	18.00	20			#	-	-
pH	s.u.	02/09/2021	N001	18.00	6.74			#	-	-
Specific Conductance	umhos/cm	02/09/2021	N001	18.00	14500			#	-	-
Temperature	C	02/09/2021	N001	18.00	16.23			#	-	-
Turbidity	NTU	02/09/2021	N001	18.00	4.37			#	-	-
Uranium	mg/L	02/09/2021	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: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/09/2021	0001	18.00	42		J	#	2	-
Oxidation Reduction Potential	mV	02/09/2021	N001	18.00	18			#	-	-
pH	s.u.	02/09/2021	N001	18.00	6.70			#	-	-
Specific Conductance	umhos/cm	02/09/2021	N001	18.00	9301			#	-	-
Temperature	C	02/09/2021	N001	18.00	15.77			#	-	-
Turbidity	NTU	02/09/2021	N001	18.00	3.89			#	-	-
Uranium	mg/L	02/09/2021	0001	18.00	0.710		J	#	1.2E-05	-

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

LOCATION: 0404 <well> Configuration 3

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/09/2021	0001	18.00	270	N	J	#	20	-
Oxidation Reduction Potential	mV	02/09/2021	N001	18.00	17			#	-	-
pH	s.u.	02/09/2021	N001	18.00	6.78			#	-	-
Specific Conductance	umhos/cm	02/09/2021	N001	18.00	13704			#	-	-
Temperature	C	02/09/2021	N001	18.00	16.95			#	-	-
Turbidity	NTU	02/09/2021	N001	18.00	3.06			#	-	-
Uranium	mg/L	02/09/2021	0001	18.00	1.800		J	#	0.00012	-

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

LOCATION: 0406 <well> Baseline Area

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/13/2021	0001	18.00	32	N	J	#	10	-
Oxidation Reduction Potential	mV	01/13/2021	N001	18.00	16			#	-	-
pH	s.u.	01/13/2021	N001	18.00	8.06			#	-	-
Specific Conductance	umhos/cm	01/13/2021	N001	18.00	5495			#	-	-
Temperature	C	01/13/2021	N001	18.00	15.07			#	-	-
Turbidity	NTU	01/13/2021	N001	18.00	3.68			#	-	-
Uranium	mg/L	01/13/2021	0001	18.00	0.700		J	#	0.00012	-

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

LOCATION: 0407 <well> Configuration 1

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/19/2021	0001	17.00	160		J	#	10	-
Ammonia Total as N	mg/L	01/19/2021	0002	17.00	160		J	#	10	-
Oxidation Reduction Potential	mV	01/19/2021	N001	17.00	128			#	-	-
pH	s.u.	01/19/2021	N001	17.00	6.04			#	-	-
Specific Conductance	umhos/cm	01/19/2021	N001	17.00	14220			#	-	-
Temperature	C	01/19/2021	N001	17.00	15.64			#	-	-
Turbidity	NTU	01/19/2021	N001	17.00	1.28			#	-	-
Uranium	mg/L	01/19/2021	0001	17.00	1.900		J	#	0.00012	-
Uranium	mg/L	01/19/2021	0002	17.00	1.900		J	#	0.00012	-

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

LOCATION: 0413 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/05/2021	0001	10.50	46		J	#	2	-
Arsenic	mg/L	01/05/2021	0001	10.50	0.041		J	#	0.00012	-
Oxidation Reduction Potential	mV	01/05/2021	N001	10.50	26			#	-	-
pH	s.u.	01/05/2021	N001	10.50	7.42			#	-	-
Selenium	mg/L	01/05/2021	0001	10.50	0.092		J	#	0.00066	-
Specific Conductance	umhos/cm	01/05/2021	N001	10.50	7672			#	-	-
Temperature	C	01/05/2021	N001	10.50	13.04			#	-	-
Turbidity	NTU	01/05/2021	N001	10.50	8.68			#	-	-
Uranium	mg/L	01/05/2021	0001	10.50	2.300		J	#	0.00012	-

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

LOCATION: 0414 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/09/2021	0001	7.50	25		J	#	2	-
Arsenic	mg/L	02/09/2021	0001	7.50	0.016		J	#	0.00012	-
Oxidation Reduction Potential	mV	02/09/2021	N001	7.50	-18			#	-	-
pH	s.u.	02/09/2021	N001	7.50	7.25			#	-	-
Selenium	mg/L	02/09/2021	0001	7.50	0.022		J	#	0.00066	-
Specific Conductance	umhos/cm	02/09/2021	N001	7.50	9867			#	-	-
Temperature	C	02/09/2021	N001	7.50	12.20			#	-	-
Turbidity	NTU	02/09/2021	N001	7.50	9.32			#	-	-
Uranium	mg/L	02/09/2021	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: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/23/2021	0001	101.00	0.2	UN	J	#	0.2	-
Oxidation Reduction Potential	mV	02/23/2021	N001	101.00	-5			#	-	-
pH	s.u.	02/23/2021	N001	101.00	7.25			#	-	-
Specific Conductance	umhos/cm	02/23/2021	N001	101.00	6588			#	-	-
Temperature	C	02/23/2021	N001	101.00	18.43			#	-	-
Turbidity	NTU	02/23/2021	N001	101.00	2.31			#	-	-
Uranium	mg/L	02/23/2021	0001	101.00	0.013		J	#	1.2E-05	-

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

LOCATION: 0432 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/23/2021	0001	55.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	02/23/2021	N001	55.00	0			#	-	-
pH	s.u.	02/23/2021	N001	55.00	7.53			#	-	-
Specific Conductance	umhos/cm	02/23/2021	N001	55.00	3451			#	-	-
Temperature	C	02/23/2021	N001	55.00	19.49			#	-	-
Turbidity	NTU	02/23/2021	N001	55.00	2.70			#	-	-
Uranium	mg/L	02/23/2021	0001	55.00	0.002		J	#	1.2E-05	-

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

LOCATION: 0433 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/23/2021	0001	99.00	0.2	U	J	#	0.2	-
Ammonia Total as N	mg/L	02/23/2021	0002	99.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	02/23/2021	N001	99.00	22			#	-	-
pH	s.u.	02/23/2021	N001	99.00	7.51			#	-	-
Specific Conductance	umhos/cm	02/23/2021	N001	99.00	4943			#	-	-
Temperature	C	02/23/2021	N001	99.00	18.67			#	-	-
Turbidity	NTU	02/23/2021	N001	99.00	3.30			#	-	-
Uranium	mg/L	02/23/2021	0001	99.00	0.002		J	#	1.2E-05	-
Uranium	mg/L	02/23/2021	0002	99.00	0.002		J	#	1.2E-05	-

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

LOCATION: 0434 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/23/2021	0001	35.00	0.28		J	#	0.2	-
Oxidation Reduction Potential	mV	02/23/2021	N001	35.00	-63			#	-	-
pH	s.u.	02/23/2021	N001	35.00	7.19			#	-	-
Specific Conductance	umhos/cm	02/23/2021	N001	35.00	51791			#	-	-
Temperature	C	02/23/2021	N001	35.00	18.91			#	-	-
Turbidity	NTU	02/23/2021	N001	35.00	1.84			#	-	-
Uranium	mg/L	02/23/2021	0001	35.00	0.028		J	#	1.2E-05	-

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

LOCATION: 0435 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/09/2021	0001	173.00	1.8		J	#	0.2	-
Oxidation Reduction Potential	mV	02/09/2021	N001	173.00	-222			#	-	-
pH	s.u.	02/09/2021	N001	173.00	7.68			#	-	-
Specific Conductance	umhos/cm	02/09/2021	N001	173.00	122815			#	-	-
Temperature	C	02/09/2021	N001	173.00	16.40			#	-	-
Turbidity	NTU	02/09/2021	N001	173.00	5.94			#	-	-
Uranium	mg/L	02/09/2021	0001	173.00	0.027		J	#	1.2E-05	-

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

LOCATION: 0436 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/11/2021	0001	197.00	2.4		J	#	0.2	-
Arsenic	mg/L	02/11/2021	0001	197.00	0.0018	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	02/11/2021	N001	197.00	-277			#	-	-
pH	s.u.	02/11/2021	N001	197.00	7.80			#	-	-
Selenium	mg/L	02/11/2021	0001	197.00	0.0014	J	J	#	0.00066	-
Specific Conductance	umhos/cm	02/11/2021	N001	197.00	116770			#	-	-
Temperature	C	02/11/2021	N001	197.00	17.91			#	-	-
Turbidity	NTU	02/11/2021	N001	197.00	3.54			#	-	-
Uranium	mg/L	02/11/2021	0001	197.00	0.0097		J	#	1.2E-05	-

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

LOCATION: 0437 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/24/2021	0001	90.00 - 100.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	02/24/2021	N001	90.00 - 100.00	1			#	-	-
pH	s.u.	02/24/2021	N001	90.00 - 100.00	7.96			#	-	-
Selenium	mg/L	02/24/2021	0001	90.00 - 100.00	0.086		J	#	0.00066	-
Specific Conductance	umhos/cm	02/24/2021	N001	90.00 - 100.00	12470			#	-	-
Temperature	C	02/24/2021	N001	90.00 - 100.00	16.79			#	-	-
Turbidity	NTU	02/24/2021	N001	90.00 - 100.00	4.13			#	-	-
Uranium	mg/L	02/24/2021	0001	90.00 - 100.00	2.600		J	#	0.00012	-

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

LOCATION: 0440 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/24/2021	0001	117.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	02/24/2021	N001	117.00	41			#	-	-
pH	s.u.	02/24/2021	N001	117.00	7.34			#	-	-
Selenium	mg/L	02/24/2021	0001	117.00	0.067		J	#	0.00066	-
Specific Conductance	umhos/cm	02/24/2021	N001	117.00	8955			#	-	-
Temperature	C	02/24/2021	N001	117.00	17.95			#	-	-
Turbidity	NTU	02/24/2021	N001	117.00	33.30			#	-	-
Uranium	mg/L	02/24/2021	0001	117.00	0.033		J	#	1.2E-05	-

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

LOCATION: 0441 <well> Queue/Support Area

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/25/2021	0001	53.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	02/25/2021	N001	53.00	28			#	-	-
pH	s.u.	02/25/2021	N001	53.00	7.19			#	-	-
Specific Conductance	umhos/cm	02/25/2021	N001	53.00	167			#	-	-
Temperature	C	02/25/2021	N001	53.00	17.30			#	-	-
Turbidity	NTU	02/25/2021	N001	53.00	2.27			#	-	-
Uranium	mg/L	02/25/2021	0001	53.00	0.055		J	#	1.2E-05	-

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

LOCATION: 0443 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/25/2021	0001	73.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	02/25/2021	N001	73.00	86			#	-	-
pH	s.u.	02/25/2021	N001	73.00	6.93			#	-	-
Specific Conductance	umhos/cm	02/25/2021	N001	73.00	6923			#	-	-
Temperature	C	02/25/2021	N001	73.00	18.01			#	-	-
Turbidity	NTU	02/25/2021	N001	73.00	4.56			#	-	-
Uranium	mg/L	02/25/2021	0001	73.00	0.013		J	#	1.2E-05	-

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

LOCATION: 0444 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/03/2021	0001	116.00	1.9		J	#	0.2	-
Oxidation Reduction Potential	mV	02/03/2021	N001	116.00	-177			#	-	-
pH	s.u.	02/03/2021	N001	116.00	7.54			#	-	-
Specific Conductance	umhos/cm	02/03/2021	N001	116.00	114693			#	-	-
Temperature	C	02/03/2021	N001	116.00	16.49			#	-	-
Turbidity	NTU	02/03/2021	N001	116.00	5.08			#	-	-
Uranium	mg/L	02/03/2021	0001	116.00	0.017		J	#	1.2E-05	-

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

LOCATION: 0453 <well> Contaminated Area

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/24/2021	0001	80.00	180		J	#	10	-
Oxidation Reduction Potential	mV	02/24/2021	N001	80.00	34			#	-	-
pH	s.u.	02/24/2021	N001	80.00	7.29			#	-	-
Selenium	mg/L	02/24/2021	0001	80.00	0.290		J	#	0.0066	-
Specific Conductance	umhos/cm	02/24/2021	N001	80.00	31964			#	-	-
Temperature	C	02/24/2021	N001	80.00	19.95			#	-	-
Turbidity	NTU	02/24/2021	N001	80.00	1.96			#	-	-
Uranium	mg/L	02/24/2021	0001	80.00	2.500		J	#	0.00012	-

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

LOCATION: 0454 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/14/2020	0001	13.00	270		J	#	20	-
Oxidation Reduction Potential	mV	12/14/2020	N001	13.00	-78			#	-	-
pH	s.u.	12/14/2020	N001	13.00	7.07			#	-	-
Specific Conductance	umhos/cm	12/14/2020	N001	13.00	66667			#	-	-
Temperature	C	12/14/2020	N001	13.00	17.33			#	-	-
Turbidity	NTU	12/14/2020	N001	13.00	8.05			#	-	-
Uranium	mg/L	12/14/2020	0001	13.00	1.500		J	#	0.00012	-

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

LOCATION: 0455 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/23/2021	0001	46.00	0.2	UN	J	#	0.2	-
Oxidation Reduction Potential	mV	02/23/2021	N001	46.00	-6			#	-	-
pH	s.u.	02/23/2021	N001	46.00	7.57			#	-	-
Specific Conductance	umhos/cm	02/23/2021	N001	46.00	3075			#	-	-
Temperature	C	02/23/2021	N001	46.00	17.56			#	-	-
Turbidity	NTU	02/23/2021	N001	46.00	999.00			#	-	-
Uranium	mg/L	02/23/2021	0001	46.00	0.0039		J	#	1.2E-05	-

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

LOCATION: 0457 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/03/2021	0001	29.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	02/03/2021	N001	29.00	-109			#	-	-
pH	s.u.	02/03/2021	N001	29.00	7.87			#	-	-
Specific Conductance	umhos/cm	02/03/2021	N001	29.00	5814			#	-	-
Temperature	C	02/03/2021	N001	29.00	17.04			#	-	-
Turbidity	NTU	02/03/2021	N001	29.00	2.32			#	-	-
Uranium	mg/L	02/03/2021	0001	29.00	0.0022		J	#	1.2E-05	-

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

LOCATION: 0492 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/01/2021	0001	18.00	220		J	#	20	-
Ammonia Total as N	mg/L	02/01/2021	0002	18.00	220		J	#	20	-
Oxidation Reduction Potential	mV	02/01/2021	N001	18.00	17			#	-	-
pH	s.u.	02/01/2021	N001	18.00	6.94			#	-	-
Specific Conductance	umhos/cm	02/01/2021	N001	18.00	16800			#	-	-
Temperature	C	02/01/2021	N001	18.00	15.99			#	-	-
Turbidity	NTU	02/01/2021	N001	18.00	1.84			#	-	-
Uranium	mg/L	02/01/2021	0001	18.00	2.200		J	#	0.00012	-
Uranium	mg/L	02/01/2021	0002	18.00	2.200		J	#	0.00012	-

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

LOCATION: 0780 <well> Configuration 4

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/12/2021	0001	28.00	250		J	#	20	-
Oxidation Reduction Potential	mV	01/12/2021	N001	28.00	30			#	-	-
pH	s.u.	01/12/2021	N001	28.00	7.73			#	-	-
Specific Conductance	umhos/cm	01/12/2021	N001	28.00	21612			#	-	-
Temperature	C	01/12/2021	N001	28.00	13.74			#	-	-
Turbidity	NTU	01/12/2021	N001	28.00	2.58			#	-	-
Uranium	mg/L	01/12/2021	0001	28.00	2.600		J	#	0.00012	-

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

LOCATION: 0781 <well> Configuration 4

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/12/2021	0001	46.00	1200		J	#	100	-
Oxidation Reduction Potential	mV	01/12/2021	N001	46.00	48			#	-	-
pH	s.u.	01/12/2021	N001	46.00	7.61			#	-	-
Specific Conductance	umhos/cm	01/12/2021	N001	46.00	67575			#	-	-
Temperature	C	01/12/2021	N001	46.00	13.44			#	-	-
Turbidity	NTU	01/12/2021	N001	46.00	3.40			#	-	-
Uranium	mg/L	01/12/2021	0001	46.00	2.900		J	#	0.00012	-

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

LOCATION: 0782 <well> Configuration 4

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/12/2021	0001	33.00	290	N	J	#	20	-
Oxidation Reduction Potential	mV	01/12/2021	N001	33.00	27			#	-	-
pH	s.u.	01/12/2021	N001	33.00	7.73			#	-	-
Specific Conductance	umhos/cm	01/12/2021	N001	33.00	20131			#	-	-
Temperature	C	01/12/2021	N001	33.00	13.46			#	-	-
Turbidity	NTU	01/12/2021	N001	33.00	2.06			#	-	-
Uranium	mg/L	01/12/2021	0001	33.00	2.800		J	#	0.00012	-

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

LOCATION: 0783 <well> Configuration 4

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/13/2021	0001	18.00	60		J	#	10	-
Oxidation Reduction Potential	mV	01/13/2021	N001	18.00	79			#	-	-
pH	s.u.	01/13/2021	N001	18.00	7.40			#	-	-
Specific Conductance	umhos/cm	01/13/2021	N001	18.00	14361			#	-	-
Temperature	C	01/13/2021	N001	18.00	14.03			#	-	-
Turbidity	NTU	01/13/2021	N001	18.00	9.96			#	-	-
Uranium	mg/L	01/13/2021	0001	18.00	1.600		J	#	0.00012	-

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

LOCATION: 0784 <well> Configuration 4

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/11/2021	0001	18.00	5.1		J	#	2	-
Oxidation Reduction Potential	mV	01/11/2021	N001	18.00	-66			#	-	-
pH	s.u.	01/11/2021	N001	18.00	8.07			#	-	-
Specific Conductance	umhos/cm	01/11/2021	N001	18.00	3096			#	-	-
Temperature	C	01/11/2021	N001	18.00	12.67			#	-	-
Turbidity	NTU	01/11/2021	N001	18.00	13.50			#	-	-
Uranium	mg/L	01/11/2021	0001	18.00	0.270		J	#	1.2E-05	-

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

LOCATION: 0785 <well> Configuration 4

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/12/2021	0001	18.00	88		J	#	10	-
Oxidation Reduction Potential	mV	01/12/2021	N001	18.00	88			#	-	-
pH	s.u.	01/12/2021	N001	18.00	7.35			#	-	-
Specific Conductance	umhos/cm	01/12/2021	N001	18.00	13444			#	-	-
Temperature	C	01/12/2021	N001	18.00	13.95			#	-	-
Turbidity	NTU	01/12/2021	N001	18.00	2.47			#	-	-
Uranium	mg/L	01/12/2021	0001	18.00	1.500		J	#	0.00012	-

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

LOCATION: 0786 <well> Configuration 4

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/07/2021	0001	28.00	450		J	#	20	-
Oxidation Reduction Potential	mV	01/07/2021	N001	28.00	-24			#	-	-
pH	s.u.	01/07/2021	N001	28.00	7.85			#	-	-
Specific Conductance	umhos/cm	01/07/2021	N001	28.00	28597			#	-	-
Temperature	C	01/07/2021	N001	28.00	13.79			#	-	-
Turbidity	NTU	01/07/2021	N001	28.00	3.63			#	-	-
Uranium	mg/L	01/07/2021	0001	28.00	3.100		J	#	0.00012	-

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

LOCATION: 0787 <well> Configuration 4

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/07/2021	0001	36.00	1200		J	#	100	-
Oxidation Reduction Potential	mV	01/07/2021	N001	36.00	-5			#	-	-
pH	s.u.	01/07/2021	N001	36.00	7.75			#	-	-
Specific Conductance	umhos/cm	01/07/2021	N001	36.00	80723			#	-	-
Temperature	C	01/07/2021	N001	36.00	12.55			#	-	-
Turbidity	NTU	01/07/2021	N001	36.00	4.64			#	-	-
Uranium	mg/L	01/07/2021	0001	36.00	2.200		J	#	0.00012	-

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

LOCATION: 0999 <borehole> EQUIPMENT BLANK

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/03/2021	0002	0.00 - 0.00	0.2	U	J	#	0.2	-
Uranium	mg/L	02/03/2021	0002	0.00 - 0.00	0.00011		J	#	1.2E-05	-

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

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

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/16/2020	0001	19.00	0.2	U	J	#	0.2	-
Arsenic	mg/L	12/16/2020	0001	19.00	0.00068	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	12/16/2020	N001	19.00	51			#	-	-
pH	s.u.	12/16/2020	N001	19.00	7.23			#	-	-
Selenium	mg/L	12/16/2020	0001	19.00	0.013		J	#	0.00066	-
Specific Conductance	umhos/cm	12/16/2020	N001	19.00	12171			#	-	-
Temperature	C	12/16/2020	N001	19.00	16.97			#	-	-
Turbidity	NTU	12/16/2020	N001	19.00	0.80			#	-	-
Uranium	mg/L	12/16/2020	0001	19.00	0.0071		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: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/14/2020	0001	48.00	400		J	#	20	-
Oxidation Reduction Potential	mV	12/14/2020	N001	48.00	-4			#	-	-
pH	s.u.	12/14/2020	N001	48.00	7.02			#	-	-
Specific Conductance	umhos/cm	12/14/2020	N001	48.00	18470			#	-	-
Temperature	C	12/14/2020	N001	48.00	16.06			#	-	-
Turbidity	NTU	12/14/2020	N001	48.00	4.15			#	-	-
Uranium	mg/L	12/14/2020	0001	48.00	2.000		J	#	0.00012	-

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

LOCATION: AMM-3 <well> Near SE corner of pile.

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/14/2020	0001	48.00	290		J	#	20	-
Oxidation Reduction Potential	mV	12/14/2020	N001	48.00	-157			#	-	-
pH	s.u.	12/14/2020	N001	48.00	7.35			#	-	-
Specific Conductance	umhos/cm	12/14/2020	N001	48.00	20075			#	-	-
Temperature	C	12/14/2020	N001	48.00	18.88			#	-	-
Turbidity	NTU	12/14/2020	N001	48.00	8.58			#	-	-
Uranium	mg/L	12/14/2020	0001	48.00	1.700		J	#	0.00012	-

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

LOCATION: ATP-1-D <well, piezometer> Piezometer; see boring ATP-1 east of pile.

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/05/2021	0001	395.00	8.5		J	#	2	-
Arsenic	mg/L	01/05/2021	0001	395.00	0.00034	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	01/05/2021	N001	395.00	-274			#	-	-
pH	s.u.	01/05/2021	N001	395.00	9.05			#	-	-
Selenium	mg/L	01/05/2021	0001	395.00	0.00097	J	J	#	0.00066	-
Specific Conductance	umhos/cm	01/05/2021	N001	395.00	14190			#	-	-
Temperature	C	01/05/2021	N001	395.00	15.94			#	-	-
Turbidity	NTU	01/05/2021	N001	395.00	8.65			#	-	-
Uranium	mg/L	01/05/2021	0001	395.00	0.00018		J	#	1.2E-05	-

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

LOCATION: ATP-1-ID <well, piezometer> East of pile.

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/05/2021	0001	293.00	4.9		J	#	2	-
Arsenic	mg/L	01/05/2021	0001	293.00	0.00022	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	01/05/2021	N001	293.00	-314			#	-	-
pH	s.u.	01/05/2021	N001	293.00	8.75			#	-	-
Selenium	mg/L	01/05/2021	0001	293.00	0.00075	J	J	#	0.00066	-
Specific Conductance	umhos/cm	01/05/2021	N001	293.00	130619			#	-	-
Temperature	C	01/05/2021	N001	293.00	16.00			#	-	-
Turbidity	NTU	01/05/2021	N001	293.00	2.17			#	-	-
Uranium	mg/L	01/05/2021	0001	293.00	0.00002	J	J	#	1.2E-05	-

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

LOCATION: ATP-1-IS <well, piezometer> East of pile.

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/07/2021	0001	213.00	2.4		J	#	0.2	-
Arsenic	mg/L	01/07/2021	0001	213.00	0.00032	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	01/07/2021	N001	213.00	-258			#	-	-
pH	s.u.	01/07/2021	N001	213.00	9.82			#	-	-
Selenium	mg/L	01/07/2021	0001	213.00	0.00072	J	J	#	0.00066	-
Specific Conductance	umhos/cm	01/07/2021	N001	213.00	129996			#	-	-
Temperature	C	01/07/2021	N001	213.00	15.88			#	-	-
Turbidity	NTU	01/07/2021	N001	213.00	4.57			#	-	-
Uranium	mg/L	01/07/2021	0001	213.00	0.00002	J	J	#	1.2E-05	-

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

LOCATION: ATP-1-S <well, piezometer> Piezometer; see boring ATP-1 east of pile.

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/07/2021	0001	145.00 - 155.00	3	N	J	#	0.2	-
Arsenic	mg/L	01/07/2021	0001	145.00 - 155.00	0.00075	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	01/07/2021	0001	145.00 - 155.00	-291			#		
pH	s.u.	01/07/2021	0001	145.00 - 155.00	9.67			#		
Selenium	mg/L	01/07/2021	0001	145.00 - 155.00	0.00066	U	J	#	0.00066	-
Specific Conductance	umhos/cm	01/07/2021	0001	145.00 - 155.00	135439			#		
Temperature	C	01/07/2021	0001	145.00 - 155.00	16.14			#		
Turbidity	NTU	01/07/2021	0001	145.00 - 155.00	5.19			#		
Uranium	mg/L	01/07/2021	0001	145.00 - 155.00	0.00019		J	#	1.2E-05	-

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: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/15/2020	0001	80.00 - 95.00	360		J	#	20	-
Oxidation Reduction Potential	mV	12/15/2020	0001	80.00 - 95.00	-296		J	#	1.2E-05	-
pH	s.u.	12/15/2020	0001	80.00 - 95.00	9.00			#		
Specific Conductance	umhos/cm	12/15/2020	0001	80.00 - 95.00	117820			#		
Temperature	C	12/15/2020	0001	80.00 - 95.00	16.42			#		
Turbidity	NTU	12/15/2020	0001	80.00 - 95.00	17.2			#		
Uranium	mg/L	12/15/2020	0001	80.00 - 95.00	0.00066		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: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/15/2020	0001	25.00	56			#	20	-
Arsenic	mg/L	12/15/2020	0001	25.00	0.0013	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	12/15/2020	N001	25.00	-195			#	-	-
pH	s.u.	12/15/2020	N001	25.00	9.51			#	-	-
Selenium	mg/L	12/15/2020	0001	25.00	0.00085	J	J	#	0.00066	-
Specific Conductance	umhos/cm	12/15/2020	N001	25.00	4165			#	-	-
Temperature	C	12/15/2020	N001	25.00	15.14			#	-	-
Turbidity	NTU	12/15/2020	N001	25.00	8.59			#	-	-
Uranium	mg/L	12/15/2020	0001	25.00	0.00073		J	#	1.2E-05	-

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

LOCATION: ATP-3 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/23/2021	0001	51.00	0.2	U	J	#	0.2	-
Arsenic	mg/L	02/23/2021	0001	51.00	0.0019	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	02/23/2021	N001	51.00	56			#	-	-
pH	s.u.	02/23/2021	N001	51.00	7.20			#	-	-
Specific Conductance	umhos/cm	02/23/2021	N001	51.00	2500			#	-	-
Temperature	C	02/23/2021	N001	51.00	18.65			#	-	-
Turbidity	NTU	02/23/2021	N001	51.00	5.63			#	-	-
Uranium	mg/L	02/23/2021	0001	51.00	0.0046		J	#	1.2E-05	-

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

LOCATION: CR1 <surface location, river>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/27/2021	0001	0.00 - 0.00	1.6		J	#	0.2	-
Oxidation Reduction Potential	mV	01/27/2021	N001	0.00 - 0.00	180			#	-	-
pH	s.u.	01/27/2021	N001	0.00 - 0.00	6.37			#	-	-
Specific Conductance	umhos/cm	01/27/2021	N001	0.00 - 0.00	1410			#	-	-
Temperature	C	01/27/2021	N001	0.00 - 0.00	1.76			#	-	-
Turbidity	NTU	01/27/2021	N001	0.00 - 0.00	6.73			#	-	-
Uranium	mg/L	01/27/2021	0001	0.00 - 0.00	0.048		J	#	1.2E-05	-

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

LOCATION: CR2 <surface location, river>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/27/2021	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	01/27/2021	N001	0.00 - 0.00	17			#	-	-
pH	s.u.	01/27/2021	N001	0.00 - 0.00	7.83			#	-	-
Specific Conductance	umhos/cm	01/27/2021	N001	0.00 - 0.00	1410			#	-	-
Temperature	C	01/27/2021	N001	0.00 - 0.00	0.90			#	-	-
Turbidity	NTU	01/27/2021	N001	0.00 - 0.00	3.76			#	-	-
Uranium	mg/L	01/27/2021	0001	0.00 - 0.00	0.009		J	#	1.2E-05	-

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

LOCATION: CR3 <surface location, river>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/01/2021	0001	0.00 - 0.00	0.35		J	#	0.2	-
Oxidation Reduction Potential	mV	02/01/2021	N001	0.00 - 0.00	-21			#	-	-
pH	s.u.	02/01/2021	N001	0.00 - 0.00	8.35			#	-	-
Specific Conductance	umhos/cm	02/01/2021	N001	0.00 - 0.00	1439			#	-	-
Temperature	C	02/01/2021	N001	0.00 - 0.00	2.33			#	-	-
Turbidity	NTU	02/01/2021	N001	0.00 - 0.00	19.00			#	-	-
Uranium	mg/L	02/01/2021	0001	0.00 - 0.00	0.008		J	#	1.2E-05	-

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

LOCATION: CR5 <surface location, river>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/27/2021	0001	0.00 - 0.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	01/27/2021	N001	0.00 - 0.00	28			#	-	-
pH	s.u.	01/27/2021	N001	0.00 - 0.00	7.57			#	-	-
Specific Conductance	umhos/cm	01/27/2021	N001	0.00 - 0.00	1443			#	-	-
Temperature	C	01/27/2021	N001	0.00 - 0.00	0.69			#	-	-
Turbidity	NTU	01/27/2021	N001	0.00 - 0.00	10.80			#	-	-
Uranium	mg/L	01/27/2021	0001	0.00 - 0.00	0.0062		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: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/05/2021	0001	44.00	250		J	#	20	-
Oxidation Reduction Potential	mV	01/05/2021	N001	44.00	28			#	-	-
pH	s.u.	01/05/2021	N001	44.00	6.91			#	-	-
Selenium	mg/L	01/05/2021	0001	44.00	0.0033	J	J	#	0.00066	-
Specific Conductance	umhos/cm	01/05/2021	N001	44.00	26523			#	-	-
Temperature	C	01/05/2021	N001	44.00	15.76			#	-	-
Turbidity	NTU	01/05/2021	N001	44.00	1.83			#	-	-
Uranium	mg/L	01/05/2021	0001	44.00	2.700		J	#	0.00012	-

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

LOCATION: SMI-MW01 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/09/2021	0001	16.00	0.82		J	#	0.2	-
Arsenic	mg/L	02/09/2021	0001	16.00	0.0021		J	#	0.00012	-
Oxidation Reduction Potential	mV	02/09/2021	N001	16.00	-69			#	-	-
pH	s.u.	02/09/2021	N001	16.00	7.54			#	-	-
Specific Conductance	umhos/cm	02/09/2021	N001	16.00	5738			#	-	-
Temperature	C	02/09/2021	N001	16.00	15.54			#	-	-
Turbidity	NTU	02/09/2021	N001	16.00	19.50			#	-	-
Uranium	mg/L	02/09/2021	0001	16.00	2.500		J	#	0.00012	-

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

LOCATION: SMI-PW01 <well> Baseline Area

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/15/2020	0001	40.00	270		J	#	20	-
Oxidation Reduction Potential	mV	12/15/2020	N001	40.00	12			#	-	-
pH	s.u.	12/15/2020	N001	40.00	6.92			#	-	-
Specific Conductance	umhos/cm	12/15/2020	N001	40.00	12663			#	-	-
Temperature	C	12/15/2020	N001	40.00	13.18			#	-	-
Turbidity	NTU	12/15/2020	N001	40.00	2.99			#	-	-
Uranium	mg/L	12/15/2020	0001	40.00	1.300		J	#	0.00012	-

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

LOCATION: SMI-PW03 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/11/2021	0001	60.00	33		J	#	2	-
Oxidation Reduction Potential	mV	02/11/2021	N001	60.00	-29			#	-	-
pH	s.u.	02/11/2021	N001	60.00	7.44			#	-	-
Specific Conductance	umhos/cm	02/11/2021	N001	60.00	10237			#	-	-
Temperature	C	02/11/2021	N001	60.00	18.16			#	-	-
Turbidity	NTU	02/11/2021	N001	60.00	9.90			#	-	-
Uranium	mg/L	02/11/2021	0001	60.00	0.360		J	#	1.2E-05	-

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

LOCATION: SMI-PZ1D2 <well> Baseline Area

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/15/2020	0001	73.00	1300		J	#	100	-
	mg/L	12/15/2020	0002	73.00	1300		J	#	100	-
Oxidation Reduction Potential	mV	12/15/2020	N001	73.00	25			#	-	-
pH	s.u.	12/15/2020	N001	73.00	6.81			#	-	-
Specific Conductance	umhos/cm	12/15/2020	N001	73.00	103666			#	-	-
Temperature	C	12/15/2020	N001	73.00	15.36			#	-	-
Turbidity	NTU	12/15/2020	N001	73.00	7.09			#	-	-
Uranium	mg/L	12/15/2020	0001	73.00	1.300		J	#	0.00012	-
	mg/L	12/15/2020	0002	73.00	1.300		J	#	0.00012	-

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

LOCATION: SMI-PZ1M <well> Baseline Area

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/15/2020	0001	55.00	700		J	#	100	-
Oxidation Reduction Potential	mV	12/15/2020	N001	55.00	24			#	-	-
pH	s.u.	12/15/2020	N001	55.00	6.93			#	-	-
Specific Conductance	umhos/cm	12/15/2020	N001	55.00	29176			#	-	-
Temperature	C	12/15/2020	N001	55.00	14.90			#	-	-
Turbidity	NTU	12/15/2020	N001	55.00	6.35			#	-	-
Uranium	mg/L	12/15/2020	0001	55.00	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: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/15/2020	0001	18.00	170		J	#	20	-
Oxidation Reduction Potential	mV	12/15/2020	N001	18.00	-6			#	-	-
pH	s.u.	12/15/2020	N001	18.00	7.04			#	-	-
Specific Conductance	umhos/cm	12/15/2020	N001	18.00	10749			#	-	-
Temperature	C	12/15/2020	N001	18.00	15.54			#	-	-
Turbidity	NTU	12/15/2020	N001	18.00	8.04			#	-	-
Uranium	mg/L	12/15/2020	0001	18.00	1.200		J	#	0.00012	-

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

LOCATION: SMI-PZ2M2 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/14/2020	0001	56.00	450		J	#	100	-
Oxidation Reduction Potential	mV	12/14/2020	N001	56.00	-29			#	-	-
pH	s.u.	12/14/2020	N001	56.00	7.15			#	-	-
Specific Conductance	umhos/cm	12/14/2020	N001	56.00	63973			#	-	-
Temperature	C	12/14/2020	N001	56.00	14.99			#	-	-
Turbidity	NTU	12/14/2020	N001	56.00	3.00			#	-	-
Uranium	mg/L	12/14/2020	0001	56.00	2.700		J	#	0.00012	-

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

LOCATION: SMI-PZ3D2 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/11/2021	0001	78.00	240		J	#	20	-
Oxidation Reduction Potential	mV	02/11/2021	N001	78.00	-14			#	-	-
pH	s.u.	02/11/2021	N001	78.00	7.09			#	-	-
Specific Conductance	umhos/cm	02/11/2021	N001	78.00	21675			#	-	-
Temperature	C	02/11/2021	N001	78.00	17.86			#	-	-
Turbidity	NTU	02/11/2021	N001	78.00	5.01			#	-	-
Uranium	mg/L	02/11/2021	0001	78.00	0.860		J	#	1.2E-05	-

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

LOCATION: SMI-PZ3M <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/11/2021	0001	59.00	19		J	#	2	-
Oxidation Reduction Potential	mV	02/11/2021	N001	59.00	-34			#	-	-
pH	s.u.	02/11/2021	N001	59.00	7.48			#	-	-
Specific Conductance	umhos/cm	02/11/2021	N001	59.00	8618			#	-	-
Temperature	C	02/11/2021	N001	59.00	17.61			#	-	-
Turbidity	NTU	02/11/2021	N001	59.00	8.56			#	-	-
Uranium	mg/L	02/11/2021	0001	59.00	0.310		J	#	1.2E-05	-

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

LOCATION: SMI-PZ3S <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/11/2021	0001	25.00	1.7		J	#	0.2	-
Arsenic	mg/L	02/11/2021	0001	25.00	0.021		J	#	0.00012	-
Oxidation Reduction Potential	mV	02/11/2021	N001	25.00	-47			#	-	-
pH	s.u.	02/11/2021	N001	25.00	8.05			#	-	-
Selenium	mg/L	02/11/2021	0001	25.00	0.032		J	#	0.00066	-
Specific Conductance	umhos/cm	02/11/2021	N001	25.00	4563			#	-	-
Temperature	C	02/11/2021	N001	25.00	18.42			#	-	-
Turbidity	NTU	02/11/2021	N001	25.00	8.41			#	-	-
Uranium	mg/L	02/11/2021	0001	25.00	0.800		J	#	1.2E-05	-

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

LOCATION: TP-01 <well> (ORNL 1/9/98)

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/16/2020	0001	22.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	12/16/2020	N001	22.00	-99			#	-	-
pH	s.u.	12/16/2020	N001	22.00	7.92			#	-	-
Specific Conductance	umhos/cm	12/16/2020	N001	22.00	7422			#	-	-
Temperature	C	12/16/2020	N001	22.00	16.81			#	-	-
Turbidity	NTU	12/16/2020	N001	22.00	1.31			#	-	-
Uranium	mg/L	12/16/2020	0001	22.00	0.046		J	#	1.2E-05	-

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

LOCATION: TP-11 <well> (ORNL 1/9/98);PWC_Moab.mdb chemistry data in both HLA Surface Water and HLA Groundwater tables

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/16/2020	0001	30.00	0.55		J	#	0.2	-
Oxidation Reduction Potential	mV	12/16/2020	N001	30.00	-175			#	-	-
pH	s.u.	12/16/2020	N001	30.00	8.06			#	-	-
Specific Conductance	umhos/cm	12/16/2020	N001	30.00	16777			#	-	-
Temperature	C	12/16/2020	N001	30.00	16.35			#	-	-
Turbidity	NTU	12/16/2020	N001	30.00	9.01			#	-	-
Uranium	mg/L	12/16/2020	0001	30.00	0.00061		J	#	1.2E-05	-

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

LOCATION: TP-17 <well> (ORNL 1/9/98)

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/01/2021	0001	28.00	2.6		J	#	0.2	-
Oxidation Reduction Potential	mV	02/01/2021	N001	28.00	-142			#	-	-
pH	s.u.	02/01/2021	N001	28.00	7.73			#	-	-
Specific Conductance	umhos/cm	02/01/2021	N001	28.00	104564			#	-	-
Temperature	C	02/01/2021	N001	28.00	13.58			#	-	-
Turbidity	NTU	02/01/2021	N001	28.00	19.00			#	-	-
Uranium	mg/L	02/01/2021	0001	28.00	0.025		J	#	1.2E-05	-

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

LOCATION: TP-20 <well> (ORNL 1/9/98)

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/14/2020	0001	32.00	2.4		J	#	0.2	-
Oxidation Reduction Potential	mV	12/14/2020	N001	32.00	-287			#	-	-
pH	s.u.	12/14/2020	N001	32.00	7366.00			#	-	-
Specific Conductance	umhos/cm	12/14/2020	N001	32.00	137210			#	-	-
Temperature	C	12/14/2020	N001	32.00	16.71			#	-	-
Turbidity	NTU	12/14/2020	N001	32.00	2.60			#	-	-
Uranium	mg/L	12/14/2020	0001	32.00	0.027		J	#	1.2E-05	-

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

LOCATION: TP-22 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/15/2020	0001	17.00	0.2	U	J	#	0.2	-
Oxidation Reduction Potential	mV	12/15/2020	N001	17.00	4			#	-	-
pH	s.u.	12/15/2020	N001	17.00	7.15			#	-	-
Specific Conductance	umhos/cm	12/15/2020	N001	17.00	30636			#	-	-
Temperature	C	12/15/2020	N001	17.00	17.76			#	-	-
Turbidity	NTU	12/15/2020	N001	17.00	15.90			#	-	-
Uranium	mg/L	12/15/2020	0001	17.00	0.390		J	#	1.2E-05	-

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

LOCATION: TP-23 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	12/14/2020	0001	26.00	180		J	#	20	-
Oxidation Reduction Potential	mV	12/14/2020	N001	26.00	-52			#	-	-
pH	s.u.	12/14/2020	N001	26.00	7.17			#	-	-
Specific Conductance	umhos/cm	12/14/2020	N001	26.00	30552			#	-	-
Temperature	C	12/14/2020	N001	26.00	18.33			#	-	-
Turbidity	NTU	12/14/2020	N001	26.00	9.90			#	-	-
Uranium	mg/L	12/14/2020	0001	26.00	2.300		J	#	0.00012	-

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

LOCATION: UPD-17 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/11/2021	0001	14.50	150		J	#	10	-
Arsenic	mg/L	02/11/2021	0001	14.50	0.017		J	#	0.00012	-
Oxidation Reduction Potential	mV	02/11/2021	N001	14.50	18			#	-	-
pH	s.u.	02/11/2021	N001	14.50	6.68			#	-	-
Selenium	mg/L	02/11/2021	0001	14.50	0.110		J	#	0.00066	-
Specific Conductance	umhos/cm	02/11/2021	N001	14.50	10290			#	-	-
Temperature	C	02/11/2021	N001	14.50	15.74			#	-	-
Turbidity	NTU	02/11/2021	N001	14.50	1.83			#	-	-
Uranium	mg/L	02/11/2021	0001	14.50	1.500		J	#	1.2E-05	-

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

LOCATION: UPD-18 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/11/2021	0001	13.00	170		J	#	10	-
Arsenic	mg/L	02/11/2021	0001	13.00	0.018		J	#	0.00012	-
Oxidation Reduction Potential	mV	02/11/2021	N001	13.00	19			#	-	-
pH	s.u.	02/11/2021	N001	13.00	6.89			#	-	-
Selenium	mg/L	02/11/2021	0001	13.00	0.075		J	#	0.00066	-
Specific Conductance	umhos/cm	02/11/2021	N001	13.00	8953			#	-	-
Temperature	C	02/11/2021	N001	13.00	16.52			#	-	-
Turbidity	NTU	02/11/2021	N001	13.00	5.91			#	-	-
Uranium	mg/L	02/11/2021	0001	13.00	0.920		J	#	1.2E-05	-

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

LOCATION: UPD-20 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/24/2021	0001	32.00	0.2	U	J	#	0.2	-
Arsenic	mg/L	02/24/2021	0001	32.00	0.00048	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	02/24/2021	N001	32.00	-1			#	-	-
pH	s.u.	02/24/2021	N001	32.00	7.99			#	-	-
Selenium	mg/L	02/24/2021	0001	32.00	0.0094	J	J	#	0.00066	-
Specific Conductance	umhos/cm	02/24/2021	N001	32.00	4052			#	-	-
Temperature	C	02/24/2021	N001	32.00	17.81			#	-	-
Turbidity	NTU	02/24/2021	N001	32.00	9.13			#	-	-
Uranium	mg/L	02/24/2021	0001	32.00	0.071		J	#	1.2E-05	-

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

LOCATION: UPD-21 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/24/2021	0001	25.00	2.9	N	J	#	0.2	-
Arsenic	mg/L	02/24/2021	0001	25.00	0.0012	J	J	#	0.00012	-
Oxidation Reduction Potential	mV	02/24/2021	N001	25.00	10			#	-	-
pH	s.u.	02/24/2021	N001	25.00	7.66			#	-	-
Selenium	mg/L	02/24/2021	0001	25.00	0.140		J	#	0.00066	-
Specific Conductance	umhos/cm	02/24/2021	N001	25.00	5149			#	-	-
Temperature	C	02/24/2021	N001	25.00	16.99			#	-	-
Turbidity	NTU	02/24/2021	N001	25.00	3.71			#	-	-
Uranium	mg/L	02/24/2021	0001	25.00	6.000		J	#	0.00012	-

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

LOCATION: UPD-22 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/05/2021	0001	9.00	6.1		J	#	2	-
Arsenic	mg/L	01/05/2021	0001	9.00	0.0048		J	#	0.00012	-
Oxidation Reduction Potential	mV	01/05/2021	N001	9.00	49			#	-	-
pH	s.u.	01/05/2021	N001	9.00	7.53			#	-	-
Selenium	mg/L	01/05/2021	0001	9.00	0.022		J	#	0.00066	-
Specific Conductance	umhos/cm	01/05/2021	N001	9.00	3720			#	-	-
Temperature	C	01/05/2021	N001	9.00	17.08			#	-	-
Turbidity	NTU	01/05/2021	N001	9.00	7.31			#	-	-
Uranium	mg/L	01/05/2021	0001	9.00	2.500		J	#	0.00012	-

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

LOCATION: UPD-23 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	01/20/2021	0001	26.00	5		J	#	2	-
Arsenic	mg/L	01/20/2021	0001	26.00	0.0026		J	#	0.00012	-
Oxidation Reduction Potential	mV	01/20/2021	N001	26.00	195			#	-	-
pH	s.u.	01/20/2021	N001	26.00	6.80			#	-	-
Selenium	mg/L	01/20/2021	0001	26.00	0.068		J	#	0.00066	-
Specific Conductance	umhos/cm	01/20/2021	N001	26.00	4057			#	-	-
Temperature	C	01/20/2021	N001	26.00	16.68			#	-	-
Turbidity	NTU	01/20/2021	N001	26.00	147.00			#	-	-
Uranium	mg/L	01/20/2021	0001	26.00	0.850		J	#	1.2E-05	-

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

LOCATION: UPD-24 <well>

REPORT DATE: 4/22/2021 10:08 AM

PARAMETER	UNITS	SAMPLE: DATE	ID	DEPTH RANGE (FT BLS)	RESULT	QUALIFIERS: LAB	DATA	QA	DETECTION LIMIT	UN-CERTAINTY
Ammonia Total as N	mg/L	02/11/2021	0001	27.00	1.3		J	#	0.2	-
Ammonia Total as N	mg/L	02/11/2021	0002	27.00	1.2		J	#	0.2	-
Arsenic	mg/L	02/11/2021	0001	27.00	0.230		J	#	0.00012	-
Arsenic	mg/L	02/11/2021	0002	27.00	0.230		J	#	0.00012	-
Oxidation Reduction Potential	mV	02/11/2021	N001	27.00	-50			#	-	-
pH	s.u.	02/11/2021	N001	27.00	7.76			#	-	-
Selenium	mg/L	02/11/2021	0001	27.00	0.071		J	#	0.00066	-
Selenium	mg/L	02/11/2021	0002	27.00	0.077		J	#	0.00066	-
Specific Conductance	umhos/cm	02/11/2021	N001	27.00	4453			#	-	-
Temperature	C	02/11/2021	N001	27.00	18.62			#	-	-
Turbidity	NTU	02/11/2021	N001	27.00	1.65			#	-	-
Uranium	mg/L	02/11/2021	0001	27.00	4.600		J	#	0.00012	-
Uranium	mg/L	02/11/2021	0002	27.00	4.900		J	#	0.00012	-

RECORDS: SELECTED FROM USEE105 WHERE RIN = '2012124' 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 compound (TIC).

P > 25% difference in detected pesticide or Aroclor 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

X Location is undefined.

R Unusable result.

U Parameter analyzed for but was not detected.

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

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

REPORT DATE: 4/8/2020 12:54 PM

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
401		3967.36	2/9/2021		13.98	3953.38	
403		3968.95	2/9/2021		16.06	3952.89	
404		3968.3	2/9/2021		14.98	3953.32	
406		3964.59	1/13/2021		11.25	3953.34	
407		3969.09	1/19/2021		17.35	3951.74	
413		3963.19	1/5/2021		8.99	3954.2	
414		3959.2	2/9/2021		5.32	3953.88	
430		4022.1	2/23/2021		61.16	3960.94	
432		4001.47	2/23/2021		43.09	3958.38	
433		3989.99	2/23/2021		32.72	3957.27	
434		3990.21	2/23/2021		35.07	3955.14	
435		3971.67	2/9/2021		15.39	3956.28	
436		3970.8	2/11/2021		11.27	3959.53	
440		4070.71	2/24/2021		112.77	3957.94	
441		4008.77	2/25/2021		50.2	3958.57	
443		4006.72	2/25/2021		47.91	3958.81	
444		3970.99	2/3/2021		15.77	3955.22	
453		4031.29	2/24/2021		73.78	3957.51	
454		3966.53	12/14/2020		13.12	3953.41	
455		3990.2	2/23/2021		33.1	3957.1	
457		3971.3	2/3/2021		16.42	3954.88	
492		3967.56	2/1/2021		16.45	3951.11	
780		3968.45	1/12/2021		16.19	3952.26	
781		3968.56	1/12/2021		15.83	3952.73	
782		3968.46	1/12/2021		16.1	3952.36	
783		3966.16	1/13/2021		14.34	3951.82	
784		3968.73	1/11/2021		19.9	3948.83	
785		3969.24	1/12/2021		16.7	3952.54	
786		3968.14	1/7/2021		16.28	3951.86	
787		3968.43	1/7/2021		16.31	3952.12	

Appendix C. December 2020 – February 2021 Site-wide Sampling Event *(continued)*
Water Level Data

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
AMM-1		3972.02	12/16/2020			17.44	3954.58
AMM-2		3964.09	12/14/2020			10.8	3953.29
AMM-3		3962.9	12/14/2020			9.37	3953.53
ATP-1-D		3970.73	1/5/2021			8.49	3962.24
ATP-1-ID		3970.87	1/5/2021			8.4	3962.47
ATP-1-IS		3971	1/7/2021			8.47	3962.53
ATP-1-S		3971.14	1/7/2021			8.53	3962.61
ATP-2-D		3962.17	12/15/2020			7.41	3954.76
ATP-2-S		3962.17	12/15/2020			11.42	3950.75
ATP-3		3998.29	2/23/2021			39.96	3958.33
MW-3		3965.98	1/5/2021			12.35	3953.63
SMI-MW01		3960.22	2/9/2021			6.74	3953.48
SMI-PW01		3963.96	12/15/2020			10.68	3953.28
SMI-PW02		3966.73	2/11/2021			20.11	3946.62
SMI-PZ1D2		3963.77	12/15/2020			10.4	3953.37
SMI-PZ1M		3963.16	12/15/2020			9.53	3953.63
SMI-PZ1S		3964.13	12/15/2020			10.89	3953.24
SMI-PZ2M2		3967.18	12/14/2020			14.79	3952.39
SMI-PZ3D2		3975.13	2/11/2021			20.26	3954.87
SMI-PZ3M		3975.23	2/11/2021			20.26	3954.97
SMI-PZ3S		3975.03	2/11/2021			20.11	3954.92
TP-01		3969.39	12/16/2020			14.2	3955.19
TP-11		3967.51	12/16/2020			12.84	3954.67
TP-17		3963.69	2/1/2021			12.6	3951.09
TP-20		3967.55	12/14/2020			15.86	3951.69
TP-22		3966.51	12/14/2020			14.35	3952.16
TP-23		3962.6	12/14/2020			9.84	3952.76

Appendix C. December 2020 – February 2021 Site-wide Sampling Event *(continued)*
Water Level Data

LOCATION CODE	FLOW CODE	TOP OF CASING ELEVATION (FT)	MEASUREMENT DATE	MEASUREMENT TIME	DEPTH FROM TOP OF CASING (FT)	WATER ELEVATION (FT)	WATER LEVEL FLAG
UPD-17		3967.4	7/11/202			13.95	3953.49
UPD-18	O	3969	2/11/2021			13.61	3955.39
UPD-20	O	3978.73	2/24/2021			23.17	3955.56
UPD-21	O	3981.45	2/24/2021			26.08	3955.37
UPD-22	O	3966.2	1/5/2021			11.63	3954.57
UPD-23	O	3982.38	1/20/2021			27.3	3955.08
UPD-24	O	3977.1	2/11/2021			22.05	3955.05

RECORDS: SELECTED FROM USEE700 WHERE Log Date BETWEEN '12/03/2019' AND '12/31/2019'

FLOW CODES:
D : DOWN GRADIENT
O : ON-SITE
U : UPGRADIENT

WATER LEVEL FLAGS:

Date: April 8, 2021
To: Ken Pill
From: James Ritchey
Subject: December 2020 through February 2021 Site Wide Sampling Event

Site: Moab – Site Wide Sampling Event
Date of Sampling Event: Dec 14, 2020 – Feb 25, 2021
Team Members: N. Andrews and J. Ritchey
RIN Number Assigned: All samples were assigned to RIN 2012124.
Sample Shipment: Three coolers were shipped overnight UPS to ALS Laboratory from Moab, Utah on December 17, 2020 and on January 19, February 4, and February 25 2021 (Tracking numbers, 1Z5W1Y510191815376, 1Z5W1Y510191997804, 1Z5W1Y510194231429, and 1Z5W1Y510199608399).

December 2020 Site Wide Sampling

Number of Locations Sampled: The purpose of the Site Wide Sampling Event is to update contaminant plume maps. A total of 72 locations (seven surface samples and 65 monitoring wells) were sampled during this event. Including five duplicates and an equipment blank, a total of 78 samples were collected during the December 2020 through February 2021 Site Wide Sampling Event.

Locations Not Sampled/Reason: Wells 0410 and 0412 were not sampled this event due to low recharge. Well 0456 was not sampled due to a faulty foot-valve preventing the use of the inertia pump sample method. All three wells were sampled in the following event (RIN 2102125). Well 0439 was also not sampled due to a damaged well casing preventing the bladder pump from being installed.

Field Variance: Well UPD-23 was sampled utilizing the inertia pump method in hopes to more effectively purge water. The static water level in this well is often too low for the peristaltic pump to pull water to the surface.

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	SMI-PZ1D2	Duplicate from 73 ft bgs	Ground Water
2001	0407	Duplicate from 17 bgs	Ground Water
2002	0492	Duplicate from 18 bgs	Ground Water
2003	NA	Equipment Blank	DI Water
2004	UPD-24	Duplicate from 27 ft bgs	Ground Water
2005	0433	Duplicate from 99 ft 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 table below provides additional information:

Location	Date	Sample Depth (ft bgs)	Comments
0201	1/27/2021	NA	Sandy bottom. Some rocks. High velocity cut. ~6ft deep.
0218	1/27/2021	NA	Silty rocks. Moderate current. ~3ft deep.
0226	2/1/2021	NA	6ft deep. Silty/sand. Moderate flow.
0401	2/9/2021	18	Floaties!
0403	2/9/2021	18	
0404	2/9/2021	18	
0406	1/13/2021	18	
0407	1/19/2021	17	Duplicate 2001 as DEC 036 @ 12:00.
0413	1/5/2021	10.5	
0414	2/9/2021	7.5	
0430	2/23/2021	101	
0432	2/23/2021	55	
0433	2/23/2021	99	Duplicate 2005, DEC 072 at 16:10.
0434	2/23/2021	35	Sulfur smell.
0435	2/9/2021	173	
0436	2/11/2021	197	
0437	2/24/2021	*	Sample depth consistent with previous historical samples.
0440	2/24/2021	117	Turbidity high but stabilized.
0441	2/25/2021	53	
0443	2/25/2021	73	
0444	2/3/2021	116	
0453	2/24/2021	80	
0454	12/14/2020	13	
0455	2/23/2021	46	Inertia pump. Small amount of water in tubing, slight effect on water level. Turbidity out of range.
0457	2/3/2021	29	Sulfur smell.
0492	2/1/2021	18	Duplicate 2002. DEC 046 @ 14:45.
AMM-1	12/16/2020	19	
AMM-2	12/14/2020	48	
AMM-3	12/14/2020	48	
ATP-1-D	1/5/2021	395	Pumped extra water out to ensure collection of well water instead of tubing water.
ATP-1-ID	1/5/2021	293	Purged 6 L pre-readings.
ATP-1-IS	1/7/2021	213	Purged 4L prior to readings.
ATP-1-S	1/7/2021	25	
ATP-2-D	12/15/2020	88	Gray water. Too many floaties to get lower turbidity.
ATP-2-S	12/15/2020	25	Water level dropping significantly. Cannot stabilize conductivity prior to water. Too low to sample.
ATP-3	2/23/2021	51	
CR1	1/27/2021	NA	2ft deep, 6-8 ft out. Cobble. Moderate flow.
CR2	1/27/2021	NA	Silty cobble. Low flow. ~2ft deep.
CR3	2/1/2021	NA	Silty sand. Low flow. 2ft deep.
CR5	1/27/2021	NA	Rocky bottom. Moderate current. ~4ft deep.
MW-3	1/5/2021	44	
SMI-MW01	2/9/2021	16	Turbidity stable.
SMI-PW01	12/15/2020	40	
SMI-PW02	2/11/2021	60	

SMI-PZ1D2	12/15/2020	73	Duplicate: DEC 013 at 15:35 False ID: 2000
SMI-PZ1M	12/15/2020	55	
SMI-PZ1S	12/15/2020	18	
SMI-PZ2M2	12/14/2020	56	
SMI-PZ3D2	2/11/2021	78	
SMI-PZ3M	2/11/2021	59	
SMI-PZ3S	2/11/2021	25	
TP-01	12/16/2020	22	
TP-11	12/16/2020	30	
TP-17	2/1/2021	28	Sulfur stink. Black floaties. Turbidity stabilized.
TP-20	12/14/2020	32	
TP-22	12/14/2020	17	Dewatered at 1.5L
TP-23	12/14/2020	26	
UPD-17	7/11/2021	14.5	
UPD-18	2/11/2021	13	
UPD-20	2/24/2021	32	
UPD-21	2/24/2021	25	
UPD-22	1/5/2021	9	
UPD-23	1/20/2021	26	Filtered in lab. Switched out tubing to use inertia pump.
UPD-24	2/11/2021	27	Duplicate 2004, DEC 062 at 13:10.

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	2/9/2021	13.98
0403	2/9/2021	16.06
0404	2/9/2021	14.98
0406	1/13/2021	11.25
0407	1/19/2021	17.35
0413	1/5/2021	8.99
0414	2/9/2021	5.32
0430	2/23/2021	61.16
0432	2/23/2021	43.09
0433	2/23/2021	32.72
0434	2/23/2021	35.07
0435	2/9/2021	15.39
0436	2/11/2021	11.27
0437	2/24/2021	49.02
0440	2/24/2021	112.77
0441	2/25/2021	50.2
0443	2/25/2021	47.91
0444	2/3/2021	15.77
0453	2/24/2021	73.78
0454	12/14/2020	13.12
0455	2/23/2021	33.1
0457	2/3/2021	16.42
0492	2/1/2021	16.45
AMM-1	12/16/2020	17.44
AMM-2	12/14/2020	10.8
AMM-3	12/14/2020	9.37
ATP-1-D	1/5/2021	8.49
ATP-1-ID	1/5/2021	8.4
ATP-1-IS	1/7/2021	8.47
ATP-1-S	1/7/2021	8.53

ATP-2-D	12/15/2020	7.41
ATP-2-S	12/15/2020	11.42
ATP-3	2/23/2021	39.96
MW-3	1/5/2021	12.35
SMI-MW01	2/9/2021	6.74
SMI-PW01	12/15/2020	10.68
SMI-PW02	2/11/2021	20.11
SMI-PZ1D2	12/15/2020	10.4
SMI-PZ1M	12/15/2020	9.53
SMI-PZ1S	12/15/2020	10.89
SMI-PZ2M2	12/14/2020	14.79
SMI-PZ3D2	2/11/2021	20.26
SMI-PZ3M	2/11/2021	20.26
SMI-PZ3S	2/11/2021	20.11
TP-01	12/16/2020	14.2
TP-11	12/16/2020	12.84
TP-17	2/1/2021	12.6
TP-20	12/14/2020	15.86
TP-22	12/14/2020	14.35
TP-23	12/14/2020	9.84
UPD-17	7/11/2021	13.95
UPD-18	2/11/2021	13.61
UPD-20	2/24/2021	23.17
UPD-21	2/24/2021	26.08
UPD-22	1/5/2021	11.63
UPD-23	1/20/2021	27.3
UPD-24	2/11/2021	22.05

December 2020 Configuration 4 Sampling

Number of Locations Sampled: Eight observation wells (0780, 0781, 0782, 0783, 0784, 0785, 0786, and 0787) were sampled during the December 2020 Sampling Event.

Locations Not Sampled: None.

Field Variance: A root growth was discovered in well 0784. This was cleared prior to sampling, but may have impacted the sample.

Quality Control Sample Cross Reference: None.

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	1/12/2021	14:20	16.19	28
0781	1/12/2021	14:35	15.83	46
0782	1/12/2021	14:50	16.1	33
0783	1/13/2021	13:55	14.34	18
0784	1/11/2021	15:10	19.9	18
0785	1/12/2021	12:10	16.7	18
0786	1/7/2021	13:50	16.28	28
0787	1/7/2021	13:35	16.31	36

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)
12/14/2020	2,050
12/15/2020	2,080
12/16/2020	2,110
12/17/2020	2,130
12/18/2020	2,150
12/19/2020	2,170
12/20/2020	2,160
12/21/2020	2,150
12/22/2020	2,110
12/23/2020	2,080
12/24/2020	2,060
12/25/2020	2,030
12/26/2020	2,020
12/27/2020	2,010
12/28/2020	2,000
12/29/2020	1,980
12/30/2020	1,960
12/31/2020	1,950
1/1/2021	1,960
1/2/2021	1,970
1/3/2021	2,040
1/4/2021	2,110
1/5/2021	2,160
1/6/2021	2,180
1/7/2021	2,190
1/8/2021	2,190
1/9/2021	2,180
1/10/2021	2,180
1/11/2021	2,150
1/12/2021	2,110
1/13/2021	2,080
1/14/2021	2,070
1/15/2021	2,080
1/16/2021	2,100

1/17/2021	2,110
1/18/2021	2,130
1/19/2021	2,150
1/20/2021	2,160
1/21/2021	2,160
1/22/2021	2,160
1/23/2021	2,160
1/24/2021	2,160
1/25/2021	2,160
1/26/2021	2,150
1/27/2021	2,140
1/28/2021	2,140
1/29/2021	2,130
1/30/2021	2,120
1/31/2021	2,110
2/1/2021	2,110
2/2/2021	2,100
2/3/2021	2,070
2/4/2021	2,130
2/5/2021	2,250
2/6/2021	2,160
2/7/2021	2,080
2/8/2021	2,080
2/9/2021	2,080
2/10/2021	2,060
2/11/2021	2,080
2/12/2021	2,150
2/13/2021	2,190
2/14/2021	2,270
2/15/2021	2,350
2/16/2021	2,140
2/17/2021	2,060
2/18/2021	2,140
2/19/2021	2,060
2/20/2021	2,050
2/21/2021	1,970
2/22/2021	2,070
2/23/2021	2,090
2/24/2021	2,070
2/25/2021	2,070

Corrective Action Required/Taken: None.