

# TECHNICAL MEMORANDUM

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**To:** Nevada Environmental Response Trust

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**Cc:** Nevada Division of Environmental Protection  
United States Environmental Protection Agency

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**From:** Chris Hayes and Dana Grady

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**Date:** March 28, 2023

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**Subject:** Unit 4 Source Area In-Situ Bioremediation Treatability Study Monthly Progress Report

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At the direction of the Nevada Environmental Response Trust (NERT or Trust), Tetra Tech, Inc. (Tetra Tech) has prepared this memorandum to summarize Tetra Tech's progress during February 2023 toward successfully implementing the Unit 4 Source Area In-Situ Bioremediation (ISB) Treatability Study.

## Task Progress Update: February 2023

### Task M21 – Unit 4 Source Area ISB Treatability Study

- Current Status –

Phase 2 of the Unit 4 Source Area ISB Treatability Study is ongoing. A layout map and construction details of all injection, monitoring, and extraction wells are provided on Figure 1 and in Table 1, respectively. Operations, maintenance, and monitoring activities completed during February 2023 are summarized below.

- Operations and Maintenance

- Area 1 – The first phase of the treatability study for Area 1 consists of a total dissolved solids (TDS) reduction period prior to the injection of a carbon substrate due to the presence of extremely elevated TDS concentrations in groundwater in the Area 1 deep zone. Groundwater-only circulation consisting of the injection of clean water (formerly known as stabilized Lake Mead water [SLMW]) in a pulsed manner and continuous groundwater extraction is being performed to reduce TDS concentrations to levels that will allow biodegradation processes to proceed (i.e., TDS concentrations to below 21,000 milligrams per liter [mg/L]) prior to carbon substrate/water injections. The water injection and extraction operations began in the Area 1 deep zone on September 8, 2022 and are on-going. Specific details of ongoing operations include:
  - No injection/extraction operations occurred within the Area 1 intermediate zone because TDS concentrations are already suitable for carbon substrate/water injections.

- During February 2023, a total of 29,553 gallons of groundwater was extracted from one extraction well screened within the Area 1 deep zone, while a total of 80,353 gallons of clean water was injected into four injection wells. Summaries of Area 1 extractions and injections are provided in Tables 2 and 3, respectively.
- Area 2 – Because TDS concentrations in Area 2 are lower than Area 1 and averaged approximately 19,500 mg/L during baseline sampling, ISB injection/extraction activities are being implemented without an initial TDS reduction step. Carbon substrate solution/water injection and groundwater extraction operations in both the intermediate and deep zones within Area 2 began on September 13, 2022 and are on-going. The injection process consists of daily-pulsed injections of a carbon substrate solution, followed by daily injections of distribution water. The carbon substrate solution currently consists of molasses, 0.5 molar sodium bicarbonate solution, trace mineral solution, and vitamin B12. The carbon substrate solution also initially contained filtered biosolids collected from the on-site fluidized bed reactors. The addition of the biosolids in the carbon substrate solution was discontinued on December 15, 2022 following completion of the first 90 days of system operation (in accordance with the NDEP-approved Unit 4 Source Area ISB Treatability Study Work Plan Addendum). As explained in previous monthly reports, the macronutrient solution consisting of urea and diammonium phosphate is not currently being added to the injectate solution to minimize precipitate formation. This macronutrient may be added in the future if required based on effectiveness monitoring results. Specific details of ongoing operations include the following:
  - During February 2023, approximately 5,515 gallons of groundwater were extracted from two extraction wells screened within the Area 2 intermediate zone, while approximately 16,040 gallons of carbon solution and 15,959 gallons of distribution water were injected into two injection wells. Within the Area 2 deep zone, approximately 14,935 gallons of groundwater were extracted from one extraction well, while approximately 33,469 gallons of carbon solution and 20,140 gallons of distribution water were injected into four injection wells. Summaries of Area 2 extractions and injections are provided in Tables 2 and 4, respectively.
  - One of the intermediate extraction wells reduced to an extraction rate of less than 0.1 gallons per minute (gpm). The extraction pump was removed from the well and inspected, which revealed a white precipitate (likely a calcium precipitate, such as calcium carbonate). Based on this observation, hydrojetting will be performed in both extraction wells in March 2023 in an effort to improve extraction rates. No well maintenance chemicals will be used during hydrojetting since the Underground Injection Control (UIC) Permit Modification submitted in March 2022 has not been approved by the Bureau of Water Pollution Control as of the date of this progress report.
- Effectiveness Monitoring – The effectiveness monitoring program included a baseline groundwater sampling event completed in April 2022 prior to system start-up. Following system start-up in early September 2022, the post-injection effectiveness monitoring program was implemented in accordance with the Work Plan Addendum. During the first month of operations, one biweekly sampling event of Area 2 monitoring wells was conducted in September 2022. The monitoring program shifted to monthly sampling in October 2022 and is ongoing for both Areas 1 and 2. Available draft groundwater analytical results from the baseline sampling event and subsequent monitoring events performed from September 2022 to January 2023 are presented in Table 5. The January 2023 groundwater results are summarized below. Groundwater analytical

results from the most recent effectiveness monitoring event performed from February 13 – February 16, 2023 will be provided in future monthly progress reports as data become available. Final validated data will be provided in the final treatability study results report.

- Area 1 Intermediate – Although active injection/extraction operations are not being performed in the Area 1 intermediate zone, groundwater samples were collected from three intermediate monitoring wells during the January 2023 sampling event. Groundwater samples collected from U4-MW-02I showed an increase in perchlorate concentrations, with a January 2023 concentration of 619 milligrams per liter (mg/L) compared to a baseline concentration of 291 mg/L. Groundwater samples collected from U4-MW-05I showed a reduction in perchlorate concentration from 1,810 mg/L in December 2022 to 1,590 mg/L in January 2023; however, concentrations continued to remain above the baseline concentration of 1,220 mg/L. The groundwater sample collected from monitoring well U4-MW-07I indicated a 38 percent decrease in perchlorate concentrations when compared to baseline concentrations. Nitrate and chlorate concentrations at monitoring well U4-MW-07I also decreased by 61 percent and 63 percent, respectively. Migration of treated groundwater from Area 2 into the intermediate zone within Area 1 is likely occurring to some extent based on the increased total organic carbon (TOC) concentrations of 31.6 mg/L and 66.5 mg/L observed in groundwater samples collected from monitoring well U4-MW-02I during the December 2022 and January 2023 sampling events, respectively. This result was expected because Area 1 is downgradient from Area 2 and groundwater modeling indicated likely incomplete capture of Area 2 injectate based on achievable extraction rates from Area 2 extraction wells. The reductions observed in samples collected from U4-MW-07I may also be related to potential connectivity with the underlying Area 1 deep zone, which is currently in the TDS reduction phase that includes active injection/extraction operations. TDS concentrations in the Area 1 intermediate zone ranged from 1,440 mg/L to 10,300 mg/L during the January 2023 reporting period. Groundwater concentration trends in the Area 1 intermediate zone will continue to be monitored.
- Area 1 Deep – Groundwater samples were collected from four deep monitoring wells and one deep extraction well in Area 1 in January 2023 to evaluate TDS reductions due to active injection/extraction operations. TDS concentration reductions ranging from 43 percent to 78 percent were observed in groundwater samples collected from the four monitoring wells. The average TDS concentration in samples collected from the four monitoring wells located immediately within Unit 4 (M251-100, U4-MW-02D, U4-MW-05D, and U4-MW-07D) reduced from an average baseline concentration of 34,305 mg/L to 17,615 mg/L in January 2023. This result represents the second consecutive effectiveness monitoring event with the average TDS concentration below the target TDS goal of 21,000 mg/L. TDS concentrations also reduced by 71 percent in the groundwater sample collected from extraction well U4-E-03D compared to baseline conditions. Data collected from the January 2023 sampling event also indicated concentration reductions of perchlorate in groundwater samples collected from three of four monitoring wells, while chlorate and nitrate reductions were observed in samples collected from all four monitoring wells. In January 2023, perchlorate concentrations in the Area 1 deep zone ranged from 66.7 mg/L to 3,140 mg/L. Groundwater concentration trends in the Area 1 deep zone will continue to be monitored and compared to the 21,000 mg/L target for the TDS reduction phase of operations to confirm the average TDS concentrations remain below the target for three consecutive events prior to switching the injections in Area 1 to ISB.

- Area 2 Intermediate – In January 2023, groundwater samples were collected from three monitoring wells and two extraction wells screened in the Area 2 intermediate zone. Perchlorate concentrations in groundwater samples collected in January 2023 from monitoring wells located in the Area 2 intermediate zone ranged from 0.381 to 59.4 mg/L, which represents perchlorate concentration reductions ranging from 86 percent to greater than 99 percent when compared to baseline concentrations. Hexavalent chromium concentrations were reduced by greater than 99 percent in groundwater samples collected from all three Area 2 intermediate monitoring wells, with concentrations ranging from 0.45 micrograms per liter ( $\mu\text{g/L}$ ) to 4.48  $\mu\text{g/L}$ . Nitrate concentrations collected from all three monitoring wells in January 2023 ranged from 0.050 mg/L to 0.360 mg/L, which represents a greater than 99 percent reduction when compared to baseline. Greater than 94 percent reduction in chlorate concentrations were also observed in groundwater samples collected from all three monitoring wells, with greater than 99 percent reduction in samples from two monitoring wells when compared to baseline concentrations. Groundwater samples collected in January 2023 also exhibited elevated TOC concentrations ranging from 67.8 mg/L to 189 mg/L, which is notably higher than the average baseline TOC concentration of 1.3 mg/L. Additionally, TOC was detected at 67.8 mg/L in the groundwater sample collected from U4-MW-13I in January 2023, which marks the highest concentration in a sample collected from this well since baseline. The combination of contaminant concentration decreases and elevated TOC concentration increases indicate that the injected carbon substrate solution is being successfully distributed throughout Area 2.
- Area 2 Deep – Groundwater samples were collected from three deep monitoring wells and one deep extraction well during the January 2023 monthly sampling event. When compared to baseline, perchlorate concentration reductions ranging from 8 percent to 71 percent were observed in groundwater samples collected from all three deep monitoring wells located within Area 2. The perchlorate concentration reduction continued to be the most significant in the groundwater sample collected from U4-MW-13D, which indicated a January 2023 concentration of 383 mg/L compared to a baseline concentration of 1,330 mg/L. Concentration reductions of nitrate and chlorate were slightly greater than that of perchlorate (reductions of up to 83 percent for nitrate and up to 73 percent for chlorate compared to baseline conditions), which is not surprising because the biodegradation sequence is often nitrate, chlorate, and then perchlorate. Hexavalent chromium concentration reductions ranging from 17 percent to 73 percent were also observed in groundwater samples collected from the three deep monitoring wells located within Area 2.
- Dye Study Monitoring – Dye samples were not collected in January or February 2023. The final dye sampling event will be conducted in March 2023, approximately six months after system start up.
- Schedule and Progress Updates
  - TDS concentrations will continue to be evaluated in groundwater samples collected from Area 1 in February 2023. If concentrations remain below the 21,000 mg/L TDS threshold, a baseline groundwater sampling event will be performed for all Area 1 monitoring wells in March 2023. Following the sampling event, Area 1 operations will transition to in-situ bioremediation consisting of carbon and nutrient injections similar to on-going activities in Area 2.
  - Area 2 ISB operations are anticipated to continue through September 2023.
- Health and Safety
  - There were no health and safety incidents related to Task M21 in February 2023.

## CERTIFICATION

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### Unit 4 Source Area In-Situ Bioremediation Treatability Study Monthly Progress Report

**Nevada Environmental Response Trust Site  
(Former Tronox LLC Site)  
Henderson, Nevada**

#### **Nevada Environmental Response Trust (NERT) Representative Certification**

I certify that this document and all attachments submitted to the Division were prepared at the request of, or under the direction or supervision of NERT. Based on my own involvement and/or my inquiry of the person or persons who manage the systems(s) or those directly responsible for gathering the information or preparing the document, or the immediate supervisor of such person(s), the information submitted and provided herein is, to the best of my knowledge and belief, true, accurate, and complete in all material respects.

Office of the Nevada Environmental Response Trust

Le Petomane XXVII, not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

**Not Individually, but Solely  
as President of the Trustee**

**Signature:** Jay A. Steinberg, President, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

**Name:** Jay A. Steinberg, not individually, but solely in his representative capacity as President of the Nevada Environmental Response Trust Trustee

**Title:** Solely as President and not individually

**Company:** Le Petomane XXVII, Inc., not individually, but solely in its representative capacity as the Nevada Environmental Response Trust Trustee

**Date:** 3/25/23

## CERTIFICATION

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I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been prepared in a manner consistent with the current standards of the profession, and to the best of my knowledge, comply with all applicable federal, state, and local statutes, regulations, and ordinances. I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

**Description of Services Provided:** Prepared Unit 4 Source Area In-Situ Bioremediation Treatability Study Monthly Progress Report.



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**David S. Wilson, CEM**  
Principal Engineer  
Tetra Tech, Inc.

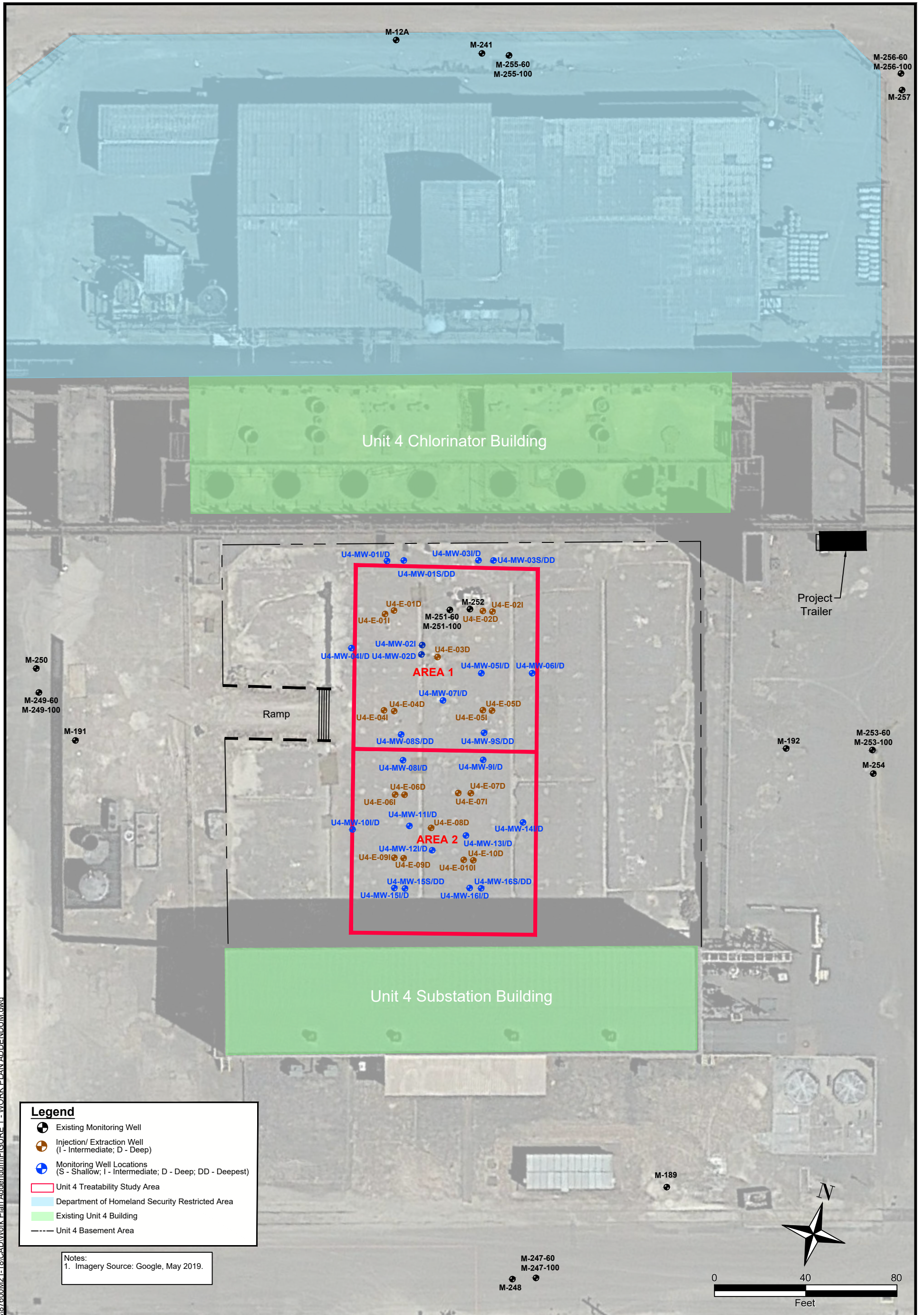
March 28, 2023

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Date

Nevada CEM Certificate Number: 2385  
Nevada CEM Expiration Date: September 19, 2024

## Figures



**Legend**

- Existing Monitoring Well
- ⊕ Injection/ Extraction Well (I - Intermediate, D - Deep)
- ⊕ Monitoring Well Locations (S - Shallow; I - Intermediate; D - Deep; DD - Deepest)
- ▭ Unit 4 Treatability Study Area
- ▭ Department of Homeland Security Restricted Area
- ▭ Existing Unit 4 Building
- Unit 4 Basement Area

Notes:  
1. Imagery Source: Google, May 2019.

NEVADA ENVIRONMENTAL RESPONSE TRUST SITE

UNIT 4 SOURCE AREA IN-SITU BIOREMEDIATION TREATABILITY STUDY  
HENDERSON, NEVADA

INJECTION/ EXTRACTION AND MONITORING WELL LAYOUT

Project No.: 117-7502021-M21  
Date: May 10, 2022  
Designed By: AC

Figure No.  
**1**

**TETRA TECH**

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\\its318fs3.tl.local\CES\Projects\87600\M21-18\CAD\Work Plan Addendum\FIGURE 1 - WORK PLAN ADDENDUM.dwg



## Tables

**Table 1**  
**Well Construction Details**  
 Unit 4 Source Area In-Situ Bioremediation Treatability Study

Well ID	Screened Lithology	Northing	Easting	Ground Surface Elevation <sup>1</sup>	Top of Casing Elevation	Construction Type	Casing Material	Screen Material	Slot Size	Filter Pack Gradation	Borehole Diameter	Borehole Total Depth	Well Diameter	Nominal Screen Length	Well Total Depth	Bottom of Screen	Top of Screen
				feet amsl	feet amsl				inches		inches	feet bgs <sup>1</sup>	inches	feet	feet bgs <sup>1</sup>	feet bgs <sup>1</sup>	feet bgs <sup>1</sup>
U4-E-01D	UMCf	26717332.49	828215.74	1805.50	1805.11	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	115.0	4	15	110.3	94.7	109.7
U4-E-01I	UMCf	26717330.42	828212.11	1805.40	1805.15	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.0	4	15	90.3	74.6	89.6
U4-E-02D	UMCf	26717338.47	828258.40	1805.55	1804.99	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	115.0	4	15	110.3	94.4	109.4
U4-E-02I	UMCf	26717338.14	828254.24	1805.51	1804.99	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.0	4	15	90.3	74.4	89.4
U4-E-04D	UMCf	26717288.90	828222.53	1805.49	1804.95	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	115.0	4	15	110.3	95.0	110.0
U4-E-03D	UMCf	26717310.37	828241.13	1805.49	1804.94	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	113.0	4	15	111.1	110.1	95.1
U4-E-04I	UMCf	26717288.51	828217.91	1805.64	1805.03	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.0	4	15	90.3	75.0	90.0
U4-E-05D	UMCf	26717295.64	828264.86	1805.48	1804.95	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	115.0	4	15	110.3	95.0	110.0
U4-E-05I	UMCf	26717295.15	828260.95	1805.58	1804.72	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.0	4	15	90.3	75.0	90.0
U4-E-06D	UMCf	26717253.44	828232.43	1805.44	1804.74	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	112.0	4	15	111.1	110.1	95.1
U4-E-06I	UMCf	26717252.90	828228.29	1805.47	1805.04	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.5	4	15	89.2	88.2	73.2
U4-E-07D	UMCf	26717258.48	828261.02	1805.62	1805.31	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	111.5	4	15	110.6	109.6	94.6
U4-E-07I	UMCf	26717257.68	828255.56	1805.62	1805.16	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.0	4	15	90.7	89.7	74.7
U4-E-08D	UMCf	26717240.82	828246.11	1805.45	1804.91	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	120.0	4	15	110.6	109.6	94.6
U4-E-09D	UMCf	26717225.92	828236.22	1805.45	1804.91	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	112.0	4	15	110.5	109.5	94.5
U4-E-09I	UMCf	26717225.46	828232.18	1805.47	1805.14	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	93.3	4	15	90.9	89.9	74.9
U4-E-10D	UMCf	26717229.55	828266.50	1805.66	1805.28	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	112.0	4	15	110.5	109.5	94.5
U4-E-10I	UMCf	26717229.15	828262.34	1805.71	1805.37	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.0	4	15	90.2	89.2	74.2
U4-MW-01I	UMCf	26717353.59	828209.51	1805.57	1805.14	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	86.7	86.7	76.7
U4-MW-01D	UMCf	26717353.51	828209.25	1805.57	1805.10		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	106.7	106.7	96.7
U4-MW-01S	UMCf	26717354.83	828216.42	1805.57	1805.02	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	131.0	2	10	64.7	64.7	54.7
U4-MW-01DD	UMCf	26717354.86	828216.87	1805.57	1805.09		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	129.9	129.9	119.9
U4-MW-02D	UMCf	26717315.33	828230.47	1805.50	1805.07	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	115.0	4	15	110.3	95.0	110.0
U4-MW-02I	UMCf	26717319.45	828230.17	1805.47	1805.07	Single	Schedule 80 PVC	Stainless Steel	0.010	#2/16	8	92.0	4	15	90.3	75.0	90.0
U4-MW-03I	UMCf	26717359.79	828248.76	1805.61	1805.17	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.3	2	10	86.6	86.6	76.6
U4-MW-03D	UMCf	26717360.01	828249.20	1805.61	1805.18		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	106.6	106.6	96.6
U4-MW-03S	UMCf	26717360.79	828255.35	1805.56	1805.19	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	131.3	2	10	64.5	64.5	54.5
U4-MW-03DD	UMCf	26717360.84	828255.62	1805.56	1805.20		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	129.7	129.7	119.7
U4-MW-04I	UMCf	26717313.50	828199.89	1805.49	1805.13	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.5	2	10	86.8	86.8	76.8
U4-MW-04D	UMCf	26717313.36	828199.55	1805.49	1805.15		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	107.0	107.0	97.0
U4-MW-05I	UMCf	26717311.18	828257.53	1805.52	1805.06	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	86.6	86.6	76.6
U4-MW-05D	UMCf	26717311.18	828257.89	1805.52	1805.05		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	108.2	108.2	98.2
U4-MW-06I	UMCf	26717314.46	828279.53	1805.52	1805.21	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.3	2	10	86.5	86.5	76.5
U4-MW-06D	UMCf	26717314.51	828279.82	1805.52	1805.20		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	107.1	107.1	97.1
U4-MW-07I	UMCf	26717296.98	828242.85	1805.36	1805.16	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	109.2	2	10	86.8	86.8	76.8
U4-MW-07D	UMCf	26717296.68	828242.80	1805.36	1805.01		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	106.5	106.5	96.5
U4-MW-08I	UMCf	26717268.25	828229.36	1805.45	1804.97	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	88.0	88.0	78.0
U4-MW-08D	UMCf	26717268.30	828229.62	1805.45	1804.99		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	108.6	108.6	98.6
U4-MW-08S	UMCf	26717279.33	828226.78	1805.47	1804.94	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	131.2	2	10	64.9	64.9	54.9
U4-MW-08DD	UMCf	26717279.35	828227.22	1805.47	1804.95		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	129.8	129.8	119.8
U4-MW-09I	UMCf	26717273.70	828264.04	1805.62	1805.22	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	86.8	86.8	76.8
U4-MW-09D	UMCf	26717273.73	828264.40	1805.62	1805.20		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	106.9	106.9	96.9
U4-MW-09S	UMCf	26717285.44	828262.62	1805.55	1805.12	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	132.0	2	10	65.3	65.3	55.3
U4-MW-09DD	UMCf	26717285.52	828263.00	1805.55	1805.12		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	129.8	129.8	119.8
U4-MW-10I	UMCf	26717234.83	828212.05	1805.55	1805.10	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	109.0	2	10	87.1	87.1	77.1
U4-MW-10D	UMCf	26717235.18	828212.26	1805.55	1805.07		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	106.9	106.9	96.9
U4-MW-11I	UMCf	26717240.19	828236.42	1805.41	1805.03	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	109.0	2	10	87.0	87.0	77.0
U4-MW-11D	UMCf	26717240.23	828236.77	1805.41	1804.96		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	107.4	107.4	97.4
U4-MW-12I	UMCf	26717231.25	828247.87	1805.47	1805.11	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.0	2	10	86.8	86.8	76.8
U4-MW-12D	UMCf	26717231.22	828248.29	1805.47	1805.12		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	107.1	107.1	97.1
U4-MW-13I	UMCf	26717242.66	828261.00	1805.64	1805.28	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	109.0	2	10	87.1	87.1	77.1
U4-MW-13D	UMCf	26717242.70	828261.37	1805.64	1805.35		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	108.2	108.2	98.2
U4-MW-14I	UMCf	26717249.26	828285.32	1805.43	1805.13	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	109.0	2	10	87.3	87.3	77.3
U4-MW-14D	UMCf	26717249.24	828285.84	1805.43	1805.05		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	107.3	107.3	97.3
U4-MW-15I	UMCf	26717212.34	828233.91	1805.48	1805.03	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	109.0	2	10	86.8	86.8	76.8
U4-MW-15D	UMCf	26717212.35	828234.41	1805.48	1804.97		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	106.0	106.0	96.0
U4-MW-15S	UMCf	26717212.89	828238.61	1805.44	1805.05	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	132.0	2	10	64.8	64.8	54.8
U4-MW-15DD	UMCf	26717212.87	828239.01	1805.44	1804.98		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	130.3	130.3	120.3
U4-MW-16I	UMCf	26717217.25	828266.62	1805.68	1805.36	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	108.5	2	10	87.0	87.0	77.0
U4-MW-16D	UMCf	26717217.40	828266.90	1805.68	1805.27		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	106.8	106.8	96.8
U4-MW-16S	UMCf	26717217.87	828271.70	1805.59	1805.24	Dual-Nested	Schedule 80 PVC	Stainless Steel	0.010	#2/16	11	131.0	2	10	64.8	64.8	54.8
U4-MW-16DD	UMCf	26717218.04	828271.95	1805.59	1805.32		Schedule 80 PVC	Stainless Steel	0.010	#2/16			2	10	130.8	130.8	120.8

Notes

- amsl - above mean sea level
- bgs - below ground surface
- bTOC - below top of casing
- PVC - polyvinyl chloride
- UMCf - Upper Muddy Creek formation

1. Ground surface refers to the concrete floor of the Unit 4 basement, which is approximately 8 feet below the surrounding grade.  
 2. Well names including E indicate an extraction/injection well. Well names including MW indicate a monitoring well.

**Table 2**  
**Summary of Groundwater Extraction Activities - January 2023**  
 Unit 4 Source Area Bioremediation Treatability Study

Study Area		Duration - Deep Wells	Area 1 Deep			Area 2 Deep			Duration - Intermediate Wells <sup>(1)</sup>	Area 2 Intermediate					
Well ID			U4-E-03D			U4-E-08D				U4-E-06I			U4-E-07I		
Date	Time		Average Flow Rate	Volume Extracted <sup>(1)</sup>	Cumulative Total Volume	Average Flow Rate	Volume Extracted <sup>(1)</sup>	Cumulative Total Volume		Average Flow Rate	Volume Extracted <sup>(1)</sup>	Cumulative Total Volume	Average Flow Rate	Volume Extracted <sup>(1)</sup>	Cumulative Total Volume
		minutes	gpm	gallons	gallons	gpm	gallons	gallons	minutes	gpm	gallons	gallons	gpm	gallons	gallons
1/1/2023	14:58	1,446	0.5	712.25	87,644.08	0.3	384.70	45,714.05	1,438	0.4	625.87	91,241.13	0.2	256.84	32,582.38
1/2/2023	15:00	1,442	0.6	801.57	88,445.65	0.3	407.88	46,121.93	1,442	0.4	580.52	91,821.65	0.2	259.85	32,842.23
1/3/2023	15:01	1,441	0.7	1,066.73	89,512.38	0.3	383.50	46,505.43	1,441	0.4	550.01	92,371.66	0.2	258.27	33,100.50
1/4/2023	15:00	1,439	0.7	979.53	90,491.91	0.3	410.06	46,915.49	1,439	0.4	525.52	92,897.18	0.2	256.49	33,356.99
1/5/2023	14:59	1,439	0.7	1,058.32	91,550.23	0.3	410.20	47,325.69	1,439	0.3	487.46	93,384.64	0.2	255.14	33,612.13
1/6/2023	15:00	1,441	0.7	1,015.03	92,565.26	0.3	408.02	47,733.71	1,441	0.3	461.07	93,845.71	0.2	256.49	33,868.62
1/7/2023	14:57	1,437	0.6	869.97	93,435.23	0.3	381.31	48,115.02	1,437	0.3	437.92	94,283.63	0.2	253.69	34,122.31
1/8/2023	14:59	1,442	0.6	837.60	94,272.83	0.3	370.89	48,485.91	1,442	0.3	414.11	94,697.74	0.2	250.32	34,372.63
1/9/2023	15:00	1,441	0.6	933.81	95,206.64	0.3	437.58	48,923.49	1,441	0.3	379.04	95,076.78	0.2	247.97	34,620.60
1/10/2023	15:00	1,440	0.7	945.35	96,151.99	0.3	438.12	49,361.61	1,440	0.2	345.97	95,422.75	0.2	247.95	34,868.55
1/11/2023	14:59	1,439	0.7	983.06	97,135.05	0.3	449.53	49,811.14	1,439	0.1	119.68	95,542.43	0.2	259.59	35,128.14
1/12/2023	15:10	1,451	0.7	1,050.67	98,185.72	0.3	501.16	50,312.30	1,451	-0.1	-85.73	95,456.70	0.2	232.35	35,360.49
1/13/2023	14:05	1,375	0.7	938.04	99,123.76	0.3	470.15	50,782.45	1,375	0.1	85.11	95,541.81	0.2	211.08	35,571.57
1/14/2023	14:59	1,494	0.7	982.45	100,106.21	0.3	504.25	51,286.70	1,494	0.1	163.47	95,705.28	0.2	269.94	35,841.51
1/15/2023	14:58	1,439	0.7	983.48	101,089.69	0.3	475.58	51,762.28	1,439	0.1	153.10	95,858.38	0.2	238.95	36,080.46
1/16/2023	15:00	1,442	0.7	1,008.66	102,098.35	0.4	520.85	52,283.13	1,442	0.1	136.37	95,994.75	0.2	237.00	36,317.46
1/17/2023	15:04	1,444	0.7	945.54	103,043.89	0.4	546.74	52,829.87	1,403	-0.02	-35.02	95,959.73	0.2	210.53	36,527.99
1/18/2023	14:55	1,431	0.8	1,091.10	104,134.99	0.4	566.11	53,395.98	612	0.3	186.56	96,146.29	0.4	232.57	36,760.56
1/19/2023	14:55	1,440	0.7	1,074.94	105,209.93	0.4	597.84	53,993.82	609	0.2	138.97	96,285.26	0.3	165.84	36,926.40
1/20/2023	14:59	1,444	0.7	1,005.67	106,215.60	0.4	571.29	54,565.11	610	0.2	150.39	96,435.65	0.3	164.52	37,090.92
1/21/2023	15:13	1,454	0.7	1,071.87	107,287.47	0.4	565.66	55,130.77	601	0.3	164.13	96,599.78	0.3	166.28	37,257.20
1/22/2023	14:58	1,425	0.7	1,048.64	108,336.11	0.4	604.79	55,735.56	591	0.2	130.01	96,729.79	0.3	161.09	37,418.29
1/23/2023	15:00	1,442	0.7	1,015.57	109,351.68	0.4	623.83	56,359.39	594	0.3	126.18	96,855.97	0.3	164.74	37,583.03
1/24/2023	15:12	1,452	0.7	1,039.20	110,390.88	0.4	585.72	56,945.11	592	0.3	162.90	97,018.87	0.3	169.03	37,752.06
1/25/2023	15:05	1,433	0.7	1,039.18	111,430.06	0.4	562.74	57,507.85	593	0.2	114.16	97,133.03	0.3	168.51	37,920.57
1/26/2023	15:13	1,448	0.6	904.99	112,335.05	0.4	570.15	58,078.00	592	0.03	17.70	97,150.73	0.3	167.79	38,088.36
1/27/2023	15:16	1,443	0.7	1,002.13	113,337.18	0.4	563.87	58,641.87	593	-0.5	-181.66	96,969.07	0.3	170.70	38,259.06
1/28/2023	15:18	1,442	0.6	933.11	114,270.29	0.4	554.37	59,196.24	607	0.1	67.21	97,036.28	0.3	176.21	38,435.27
1/29/2023	15:04	1,426	0.7	978.98	115,249.27	0.4	608.26	59,804.50	600	0.03	12.07	97,048.35	0.3	171.61	38,606.88
1/30/2023	15:04	1,440	0.7	1,037.16	116,286.43	0.4	553.69	60,358.19	600	0.3	102.91	97,151.26	0.3	177.03	38,783.91
1/31/2023	15:04	1,440	0.7	999.35	117,285.78	0.4	515.55	60,873.74	600	0.2	55.04	97,206.30	0.3	180.41	38,964.32
<b>September 2022 Total</b>				<b>24,421</b>				<b>8,874</b>				<b>30,780</b>			<b>9,315</b>
<b>October 2022 Total</b>				<b>25,384</b>				<b>12,595</b>				<b>24,357</b>			<b>8,912</b>
<b>November 2022 Total</b>				<b>16,563</b>				<b>13,496</b>				<b>14,899</b>			<b>7,172</b>
<b>December 2022 Total</b>				<b>20,564</b>				<b>10,365</b>				<b>20,580</b>			<b>6,926</b>
<b>January 2023 Total</b>				<b>30,354</b>				<b>15,544</b>				<b>6,591</b>			<b>6,639</b>

Notes:

gpm - gallons per minute

1. Extraction operations are active 24 hours per day. Volume and duration quantities represent gallons or minutes of extraction since previous record indicated. On January 18, 2023, Area 2 intermediate wells were transitioned from 24-hour operation to 12-hour operation in an effort to improve daily extraction rates.

2. On 1/12, 1/17, and 1/27, extraction well U4-E-6I periodically lost flow, resulting in anomalous flow meter readings. The meter was recalibrated to confirm proper functionality and pumping resumed.

**Table 3**  
**Summary of Injection Activities**  
**Area 1 - January 2023**  
 Unit 4 Source Area Bioremediation Treatability Study

Study Area				Area 1 Deep											
Well ID				U4-E-01D			U4-E-02D			U4-E-04D			U4-E-05D		
Date	Injection Start Time	Injection Stop Time	Duration	Average Flow Rate	Volume Injected	Maximum Injection Pressure	Average Flow Rate	Volume Injected	Maximum Injection Pressure	Average Flow Rate	Volume Injected	Maximum Injection Pressure	Average Flow Rate	Volume Injected	Maximum Injection Pressure
			minutes	gpm	gallons	psi	gpm	gallons	psi	gpm	gallons	psi	gpm	gallons	psi
1/1/2023	5:11	13:53	478	1.5	728.50	20	1.5	726.65	31	1.5	725.71	21	1.5	723.99	25
1/2/2023	4:42	13:17	471	1.5	715.54	21	1.5	712.39	31	1.5	708.47	19	1.5	712.00	25
1/3/2023	5:21	14:10	485	1.5	742.39	21	1.5	743.11	31	1.5	738.48	21	1.6	754.77	25
1/4/2023	5:31	13:42	448	1.5	687.16	21	1.5	686.29	31	1.5	676.34	19	1.5	694.07	26
1/5/2023	5:33	13:53	456	1.5	694.22	21	1.5	705.70	32	1.6	708.19	21	1.5	692.06	25
1/6/2023	5:31	13:56	461	1.5	696.91	21	1.5	702.45	30	1.5	688.68	19	1.5	700.52	26
1/7/2023	5:31	14:03	468	1.5	717.48	21	1.5	711.16	32	1.5	708.74	21	1.5	715.05	25
1/8/2023	5:31	13:54	459	1.5	704.88	22	1.5	702.23	31	1.5	691.67	19	1.5	698.87	26
1/9/2023	5:31	13:56	461	1.5	703.34	21	1.5	710.34	31	1.5	702.33	21	1.5	705.09	25
1/10/2023	5:31	13:57	462	1.5	701.38	21	1.5	700.80	31	1.5	701.48	20	1.5	707.20	25
1/11/2023	5:31	13:52	457	1.5	695.62	22	1.5	701.11	31	1.5	695.75	22	1.5	692.04	26
1/12/2023	5:31	14:02	467	1.5	709.66	21	1.5	714.77	31	1.5	704.30	20	1.5	708.31	26
1/13/2023	5:31	12:56	401	1.5	617.93	22	1.5	610.13	31	1.5	614.66	21	1.5	609.05	26
1/14/2023	5:31	14:04	469	1.5	715.83	21	1.5	721.71	32	1.5	708.82	20	1.5	722.19	26
1/15/2023	5:31	14:05	470	1.5	711.76	21	1.5	714.17	32	1.5	719.45	22	1.5	713.06	26
1/16/2023	5:31	14:10	475	1.5	717.09	21	1.6	744.88	32	1.5	714.90	20	1.5	733.17	25
1/17/2023	5:31	14:15	480	1.5	740.34	21	1.5	736.84	32	1.5	738.18	22	1.5	730.08	26
1/18/2023	5:31	14:10	475	1.5	726.52	21	1.5	727.32	31	1.5	718.48	22	1.5	728.51	26
1/19/2023	5:31	14:10	475	1.5	725.24	22	1.5	726.34	32	1.5	726.91	22	1.5	735.97	26
1/20/2023	5:31	14:09	474	1.5	728.51	21	1.5	730.59	32	1.5	720.55	22	1.5	725.22	26
1/21/2023	5:31	14:08	473	1.5	721.26	22	1.6	734.00	32	1.5	723.32	22	1.5	717.73	26
1/22/2023	5:31	14:26	492	1.6	764.59	22	1.5	759.37	31	1.5	748.22	22	1.5	758.84	26
1/23/2023	5:31	14:09	474	1.5	725.27	22	1.5	724.77	32	1.5	726.14	22	1.5	725.22	26
1/24/2023	5:31	14:10	475	1.5	729.84	22	1.5	732.13	32	1.5	729.19	22	1.5	726.75	26
1/25/2023	5:31	14:17	482	1.5	741.67	22	1.5	743.04	32	1.5	738.68	22	1.5	741.99	26
1/26/2023	5:31	14:11	476	1.5	733.89	22	1.5	736.64	32	1.5	728.92	22	1.5	732.15	26
1/27/2023	5:31	14:09	474	1.5	725.98	22	1.6	741.23	32	1.5	721.98	20	1.5	726.65	26
1/28/2023	5:31	14:07	472	1.5	726.09	22	1.5	727.90	31	1.5	715.39	22	1.5	718.97	26
1/29/2023	5:31	14:13	478	1.6	741.88	22	1.5	728.77	32	1.5	725.55	20	1.5	728.41	26
1/30/2023	5:31	14:13	478	1.5	729.15	22	1.5	735.22	32	1.5	719.21	21	1.5	734.05	26
1/31/2023	5:31	13:50	455	1.5	666.06	21	1.6	709.31	31	1.5	688.25	22	1.5	702.36	27
<b>September 2022 Total</b>					<b>18,524.74</b>			<b>17,036.15</b>			<b>18,474.90</b>			<b>18,327.61</b>	
<b>October 2022 Total</b>					<b>20,999.35</b>			<b>20,565.66</b>			<b>20,499.99</b>			<b>20,495.77</b>	
<b>November 2022 Total</b>					<b>13,189.82</b>			<b>13,023.57</b>			<b>13,008.37</b>			<b>12,999.23</b>	
<b>December 2022 Total</b>					<b>17,897.70</b>			<b>17,859.83</b>			<b>17,761.96</b>			<b>17,821.88</b>	
<b>January 2023 Total</b>					<b>22,185.98</b>			<b>22,301.36</b>			<b>22,076.94</b>			<b>22,214.34</b>	
<b>Cumulative Total</b>					<b>92,797.59</b>			<b>90,786.57</b>			<b>91,822.16</b>			<b>91,858.83</b>	

Notes:

gpm - gallons per minute

psi - pounds per square inch

1. Injectate solution in Area 1 Deep wells consists of only Stabilized Lake Mead Water as part of the total dissolved solids (TDS)-reduction period of the treatability study.

**Table 4**  
**Summary of Injection Activities**  
**Area 2 - January 2023**  
 Unit 4 Source Area Bioremediation Treatability Study

Study Area			Area 2 Intermediate									Area 2 Deep				
Well ID			Area 2 Intermediate Duration <sup>(1)</sup>	U4-E-09I				U4-E-10I				Area 2 Deep Duration <sup>(1)</sup>	U4-E-06D			
Date	Injection Start Time	Injection Stop Time		Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure	Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure		Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure
				gallons	gallons	gpm	psi	gallons	gallons	gpm	psi		gallons	gallons	gpm	psi
1/1/2023	5:10	13:53	296	271.70	265.85	1.8	8	282.19	268.21	1.9	11	478	289.05	183.31	1.6	21
1/2/2023	4:41	13:17	299	275.47	290.73	1.9	8	269.55	280.73	1.8	11	471	290.41	175.44	1.6	21
1/3/2023	5:20	14:10	299	275.34	284.64	1.9	8	280.37	277.02	1.9	11	485	298.50	180.38	1.6	20
1/4/2023	5:30	13:42	301	287.03	292.69	1.9	9	282.82	285.86	1.9	11	448	285.27	160.39	1.5	20
1/5/2023	5:32	13:53	300	275.07	271.65	1.8	8	276.29	276.29	1.8	11	456	289.37	172.72	1.5	20
1/6/2023	5:30	13:56	300	289.31	278.95	1.9	9	280.95	281.16	1.9	10	461	280.07	173.43	1.5	19
1/7/2023	5:30	14:03	324	281.78	280.28	1.7	9	279.79	283.89	1.7	10	468	295.49	179.11	1.5	19
1/8/2023	5:30	13:54	300	294.62	278.81	1.9	8	296.10	279.65	1.9	10	459	284.74	180.64	1.6	20
1/9/2023	5:30	13:56	300	282.47	274.09	1.9	8	288.88	281.20	1.9	9	461	286.38	182.43	1.6	19
1/10/2023	5:30	13:57	300	280.10	278.55	1.9	8	285.26	287.58	1.9	10	462	292.39	175.59	1.6	19
1/11/2023	5:30	13:52	300	288.98	292.80	1.9	9	288.62	283.78	1.9	10	457	293.66	174.54	1.6	20
1/12/2023	5:30	14:02	300	284.22	275.86	1.9	10	286.07	282.02	1.9	10	467	295.05	184.40	1.6	20
1/13/2023	5:30	12:56	369	405.51	425.45	1.8	9	425.68	281.01	1.9	10	401	226.36	181.17	1.1	20
1/14/2023	5:30	14:04	329	272.75	277.24	1.7	9	290.72	279.65	1.7	10	469	298.04	179.52	1.5	22
1/15/2023	5:30	14:05	300	278.81	280.26	1.9	9	287.76	286.00	1.9	10	470	300.72	182.45	1.6	22
1/16/2023	5:30	14:10	300	274.04	286.10	1.9	9	277.62	284.26	1.9	10	475	290.56	179.72	1.6	22
1/17/2023	5:30	14:15	300	274.76	283.73	1.9	9	290.62	285.43	1.9	10	480	308.67	182.00	1.6	22
1/18/2023	5:30	14:10	300	273.94	285.91	1.9	10	281.30	285.24	1.9	10	475	305.27	180.16	1.6	23
1/19/2023	5:30	14:10	300	279.59	290.94	1.9	10	289.06	289.44	1.9	10	475	294.81	180.18	1.6	23
1/20/2023	5:30	14:09	300	278.80	291.55	1.9	10	282.64	288.88	1.9	10	474	307.75	179.45	1.6	22
1/21/2023	5:30	14:08	300	283.32	280.45	1.9	10	284.28	287.98	1.9	10	473	293.41	179.16	1.6	23
1/22/2023	5:30	14:26	300	234.47	282.95	1.7	10	286.68	285.42	1.9	11	492	319.36	177.50	1.7	22
1/23/2023	5:30	14:09	300	273.88	289.36	1.9	10	290.95	289.12	1.9	10	474	301.44	184.02	1.6	22
1/24/2023	5:30	14:10	300	283.09	288.33	1.9	10	289.20	279.01	1.9	10	475	300.59	189.43	1.6	23
1/25/2023	5:30	14:17	300	271.52	276.63	1.8	10	280.69	287.28	1.9	10	482	308.40	182.77	1.6	23
1/26/2023	5:30	14:11	300	283.56	279.87	1.9	10	291.79	291.78	1.9	10	476	309.04	183.88	1.6	23
1/27/2023	5:30	14:09	300	285.94	289.41	1.9	10	290.12	284.99	1.9	10	474	305.48	183.20	1.6	23
1/28/2023	5:30	14:07	300	270.36	288.45	1.9	10	286.91	284.78	1.9	10	472	298.37	182.50	1.6	24
1/29/2023	5:30	14:13	300	291.51	271.10	1.9	9	294.39	286.75	1.9	10	478	295.96	186.07	1.6	22
1/30/2023	5:30	14:13	300	287.78	281.79	1.9	9	291.64	283.21	1.9	10	478	304.89	180.47	1.6	24
1/31/2023	5:30	13:50	300	305.18	286.85	2.0	9	303.66	281.10	1.9	10	455	275.59	181.02	1.5	24
<b>September 2022 Total</b>				<b>8,865.83</b>	<b>7,003.57</b>			<b>8,525.14</b>	<b>6,908.92</b>				<b>2,749.97</b>	<b>2,328.86</b>		
<b>October 2022 Total</b>				<b>15,362.98</b>	<b>11,815.29</b>			<b>15,427.59</b>	<b>11,782.52</b>				<b>4,281.88</b>	<b>3,201.80</b>		
<b>November 2022 Total</b>				<b>15,314.47</b>	<b>11,462.79</b>			<b>15,310.27</b>	<b>11,478.18</b>				<b>4,280.61</b>	<b>3,139.23</b>		
<b>December 2022 Total</b>				<b>12,543.83</b>	<b>9,501.76</b>			<b>12,648.32</b>	<b>9,589.05</b>				<b>4,051.14</b>	<b>2,723.55</b>		
<b>January 2023 Total</b>				<b>8,794.90</b>	<b>8,751.27</b>			<b>9,012.60</b>	<b>8,788.72</b>				<b>9,125.09</b>	<b>5,577.05</b>		
<b>Cumulative Total</b>				<b>60,882.01</b>	<b>48,534.68</b>			<b>60,923.92</b>	<b>48,547.39</b>				<b>24,488.69</b>	<b>16,970.49</b>		

Notes:

gpm - gallons per minute

psi - pounds per square inch

1. Injection duration indicates the total minutes of active injection per day, accounting for any downtime in injections that may have occurred throughout the day. Therefore, injection duration may be less than the difference in daily injection start and stop times indicated.

2. Carbon substrate solution is batch mixed. Batches of carbon substrate solution includes the following components in solution with Stabilized Lake Mead Water (SLMW): 0.5% molasses, 1.25% 0.5 Molar Sodium Bicarbonate Solution, 0.001% trace mineral solution, and 5 milligrams per liter Vitamin B12.

3. Distribution water solution is batch mixed. Batches of distribution water solution includes 0.0025 pounds of Vitamin C per gallon of Stabilized Lake Mead Water (SLMW).

**Table 4**  
**Summary of Injection Activities**  
**Area 2 - January 2023**  
 Unit 4 Source Area Bioremediation Treatability Study

Study Area			Area 2 Deep											
Well ID			U4-E-07D				U4-E-09D				U4-E-010D			
Date	Injection Start Time	Injection Stop Time	Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure	Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure	Volume Carbon Solution Injected <sup>(2)</sup>	Volume Distribution Water Solution Injected <sup>(3)</sup>	Average Flow Rate	Maximum Injection Pressure
			gallons	gallons	gpm	psi	gallons	gallons	gpm	psi	gallons	gallons	gpm	psi
1/1/2023	5:10	13:53	292.57	185.96	1.6	17	293.67	184.37	1.6	13	291.81	184.69	1.6	16
1/2/2023	4:41	13:17	293.22	186.26	1.6	17	293.32	165.36	1.5	14	296.11	172.26	1.6	17
1/3/2023	5:20	14:10	292.41	178.39	1.6	17	299.49	182.62	1.6	14	300.74	182.58	1.6	17
1/4/2023	5:30	13:42	288.39	162.28	1.5	17	282.80	167.87	1.5	14	286.97	167.14	1.5	18
1/5/2023	5:32	13:53	283.77	170.84	1.5	17	289.92	172.69	1.5	14	288.84	172.88	1.5	18
1/6/2023	5:30	13:56	292.97	177.28	1.6	17	287.64	179.28	1.6	14	283.42	177.07	1.5	18
1/7/2023	5:30	14:03	287.92	175.44	1.4	17	299.55	177.70	1.5	14	295.16	177.14	1.5	18
1/8/2023	5:30	13:54	287.58	178.51	1.6	18	279.41	179.92	1.5	14	285.13	181.51	1.6	16
1/9/2023	5:30	13:56	292.38	182.41	1.6	17	289.90	179.94	1.6	15	284.42	179.52	1.5	16
1/10/2023	5:30	13:57	287.88	177.53	1.6	16	295.04	177.29	1.6	14	295.36	175.55	1.6	16
1/11/2023	5:30	13:52	290.21	177.13	1.6	17	297.28	176.19	1.6	15	287.43	175.72	1.5	16
1/12/2023	5:30	14:02	299.14	181.84	1.6	18	289.00	181.38	1.6	15	292.01	183.25	1.6	16
1/13/2023	5:30	12:56	229.94	186.79	1.1	18	219.79	181.86	1.1	14	218.37	165.28	1.0	16
1/14/2023	5:30	14:04	297.02	186.77	1.5	17	293.98	183.48	1.5	14	294.18	182.04	1.4	16
1/15/2023	5:30	14:05	294.71	183.50	1.6	17	288.49	182.74	1.6	14	292.56	181.23	1.6	17
1/16/2023	5:30	14:10	309.19	186.65	1.7	17	300.91	184.42	1.6	14	300.93	181.45	1.6	16
1/17/2023	5:30	14:15	294.75	182.52	1.6	17	291.62	188.32	1.6	14	297.74	186.10	1.6	16
1/18/2023	5:30	14:10	303.26	181.72	1.6	17	304.78	180.60	1.6	15	299.40	182.19	1.6	17
1/19/2023	5:30	14:10	321.76	185.36	1.7	18	294.20	185.40	1.6	16	303.18	184.74	1.6	16
1/20/2023	5:30	14:09	301.56	172.98	1.6	18	304.32	182.93	1.6	14	292.32	184.97	1.6	17
1/21/2023	5:30	14:08	308.27	187.45	1.7	18	296.89	185.82	1.6	15	302.92	184.74	1.6	17
1/22/2023	5:30	14:26	316.14	179.71	1.7	18	304.07	178.61	1.6	12	293.33	178.23	1.6	16
1/23/2023	5:30	14:09	302.74	177.43	1.6	18	295.17	180.22	1.6	13	294.94	183.39	1.6	17
1/24/2023	5:30	14:10	309.93	189.61	1.7	26	302.64	184.14	1.6	14	293.83	185.50	1.6	17
1/25/2023	5:30	14:17	300.35	187.34	1.6	18	308.90	184.66	1.6	13	304.58	187.11	1.6	17
1/26/2023	5:30	14:11	299.69	185.04	1.6	18	304.63	184.33	1.6	14	300.86	185.55	1.6	16
1/27/2023	5:30	14:09	302.72	185.94	1.6	18	295.18	184.35	1.6	13	290.50	179.89	1.6	17
1/28/2023	5:30	14:07	303.68	185.57	1.6	18	307.74	184.24	1.6	13	307.51	182.69	1.6	18
1/29/2023	5:30	14:13	290.68	189.81	1.6	18	286.15	195.96	1.6	15	296.38	185.19	1.6	17
1/30/2023	5:30	14:13	304.44	192.25	1.7	17	301.16	188.05	1.6	16	300.49	190.42	1.6	19
1/31/2023	5:30	13:50	285.99	181.55	1.6	17	280.30	187.46	1.6	14	296.66	182.21	1.6	17
<b>September 2022 Total</b>			<b>2,768.33</b>	<b>2,227.39</b>			<b>2,693.95</b>	<b>2,339.33</b>			<b>2,696.94</b>	<b>2,327.15</b>		
<b>October 2022 Total</b>			<b>4,439.80</b>	<b>3,249.33</b>			<b>4,261.59</b>	<b>3,153.44</b>			<b>4,335.35</b>	<b>3,185.87</b>		
<b>November 2022 Total</b>			<b>4,388.95</b>	<b>3,241.27</b>			<b>4,248.86</b>	<b>3,171.31</b>			<b>4,162.71</b>	<b>3,115.27</b>		
<b>December 2022 Total</b>			<b>3,877.76</b>	<b>2,796.99</b>			<b>3,788.26</b>	<b>2,771.17</b>			<b>3,634.87</b>	<b>2,693.12</b>		
<b>January 2023 Total</b>			<b>9,165.26</b>	<b>5,641.86</b>			<b>9,077.94</b>	<b>5,632.20</b>			<b>9,068.08</b>	<b>5,602.23</b>		
<b>Cumulative Total</b>			<b>24,640.10</b>	<b>17,156.84</b>			<b>24,070.60</b>	<b>17,067.45</b>			<b>23,897.95</b>	<b>16,923.64</b>		

Notes:

gpm - gallons per minute

psi - pounds per square inch

1. Injection duration indicates the total minutes of active injection per day, accounting for any downtime in injections that may have occurred throughout the day. Therefore, injection duration may be less than the difference in daily injection start and stop times indicated.

2. Carbon substrate solution is batch mixed. Batches of carbon substrate solution includes the following components in solution with Stabilized Lake Mead Water (SLMW): 0.5% molasses, 1.25% 0.5 Molar Sodium Bicarbonate Solution, 0.001% trace mineral solution, and 5 milligrams per liter Vitamin B12.

3. Distribution water solution is batch mixed. Batches of distribution water solution includes 0.0025 pounds of Vitamin C per gallon of Stabilized Lake Mead Water (SLMW).







Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	E314.0		E300.1		Anions by E300.0/SW9065A			E350.1	E351.2	E365.1	Alkalinity by SM2320B				Dissolved Metals by SW6020									
						Perchlorate	Chlorate	Chlorite	Chloride	Nitrate (as N)	Sulfate	Ammonia (as N)	Total Kjeldahl Nitrogen (TKN)	Phosphorus	Alkalinity as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Hydroxide Alkalinity as CaCO3	Antimony	Arsenic	Cadmium	Copper	Lead	Nickel	Selenium	Silver	Thallium	Uranium	
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-12I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	6,800	26,800	<12,000	<117	629 J+	<33.3	---	---	---	592,000	592,000	<8,450	<8,450	<18.5	1.36 J	108	20.7	<0.190	<0.150	86,600	63.3	0.171 J	<1.51	
U4-MW-12I	12/7/2022	FD	EM04	UMCf	76.8 - 86.8	6,630	28,700	<12,000	<117	739 J+	<33.3	---	---	---	---	---	---	---	21.6 J	1.26 J	108	20.7	<0.190	<0.150	86,400	64.8	0.173 J	<1.51	
U4-MW-12I	1/13/2023	N	EM05	UMCf	76.8 - 86.8	2,450	24,100	<2,400	<117	579	<33.3	197,000	83.5 J	44,500	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
U4-MW-13D	4/14/2022	N	BL02	UMCf	98.2 - 108.2	1,330,000	14,700,000	<240,000	<117	<1,400	115 J+	3,130,000	60,700	662,000	128,000	128,000	<8,450	<8,450	375 J	<10.3	5.43 J	173	<1.65	<1.50	1,520,000	55,300	<4.20	<15.1	
U4-MW-13D	9/28/2022	N	EM01	UMCf	98.2 - 108.2	401,000	5,370,000	<24,000	<117	<280	<33.3 UJ	1,330,000	10,900	336,000 J	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
U4-MW-13D	10/11/2022	N	EM02	UMCf	98.2 - 108.2	413,000	4,100,000	<120,000	<117	<560	<33.3	1,400,000	6,780 J	379,000 J	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
U4-MW-13D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	433,000	4,080,000	<240,000	<117	<280	<33.3	1,300,000	6,960	295,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
U4-MW-13D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	411,000	3,380,000	<240,000	257	<700	<33.3	1,190,000	9,910 J	288,000 J	190,000	190,000	<8,450	<8,450	<92.5	<5.15	7.37 J	100	<0.950	<0.750	494,000	17,900	<0.298	<7.55	
U4-MW-13D	1/12/2023	N	EM05	UMCf	98.2 - 108.2	383,000	3,950,000	<240,000	<117	<280	<33.3	984,000	10,300	289,000 J	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
U4-MW-13I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	418,000	4,180,000	<24,000	<117	<1,400	109 J+	943,000	7,030	1,090,000	116,000	116,000	<8,450	<8,450	<56.1	<1.03	12.6	43.5	<0.330	<0.150	395,000	20,300	<0.840	<1.51	
U4-MW-13I	9/28/2022	N	EM01	UMCf	77.1 - 87.1	233,000	1,720,000	<12,000	<117	<280	79.5 J	487,000	9,130 J	1,040,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
U4-MW-13I	10/10/2022	N	EM02	UMCf	77.1 - 87.1	212,000	1,410,000	<24,000	<117	<140	50.5 J	441,000	5,560	1,060,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
U4-MW-13I	11/3/2022	N	EM03	UMCf	77.1 - 87.1	149,000	830,000	<24,000	<117	<140	<33.3	402,000	3,730	932,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
U4-MW-13I	12/6/2022	N	EM04	UMCf	77.1 - 87.1	69,200	337,000	<24000 UJ	122 J	<140 UJ	<33.3 UJ	467,000	<48.0 UJ	545,000	599,000	599,000	<8450 UJ	<8450 UJ	<18.5 UJ	2.00 J	79.2	19.6	<0.190 UJ	<0.150 UJ	100,000	892	0.138 J	<1.51 UJ	
U4-MW-13I	1/12/2023	N	EM05	UMCf	77.1 - 87.1	59,400	261,000	<24,000	<117	<140	75.6 J	447,000	360	433,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
U4-MW-14D	4/13/2022	N	BL02	UMCf	97.3 - 107.3	140,000	462,000	<12,000	<117	<140	33.3 R	349,000	729 J	2,560,000	101,000	101,000	<8,450	<8,450	<56.1	<1.03	21.3	33.5	<0.330	<0.150	561,000	308	<0.840	3.44 J	
U4-MW-14D	12/6/2022	N	EM04	UMCf	97.3 - 107.3	207,000 J+	1,300,000	<24000 UJ	<117 UJ	<140 UJ	<33.3 UJ	432,000	3,700	946,000	71,300	71,300	<8450 UJ	<8450 UJ	20.6 J	<1.03 UJ	14.6	56.2	<0.190 UJ	<0.150 UJ	395,000	6,790	<0.0596 UJ	<1.51 UJ	
U4-MW-14I	4/14/2022	N	BL02	UMCf	77.3 - 87.3	181,000	506,000	<2,400	<117	<140	173 J+	274,000	2,490	1,410,000	77,600	70,500	<8,450	<8,450	<56.1	<1.03	16.6	23.1	<0.330	<0.150	237,000	2,150	<0.840	<1.51	
U4-MW-14I	12/6/2022	N	EM04	UMCf	77.3 - 87.3	249,000	1,060,000	<24000 UJ	<117 UJ	<140 UJ	<33.3 UJ	401,000	2,700	1,490,000	87,400	87,400	<8450 UJ	<8450 UJ	<18.5 UJ	<1.03 UJ	17.1	49.4	<0.190 UJ	<0.150 UJ	524,000	4,710	0.0650 J	<1.51 UJ	
U4-MW-15D	4/13/2022	N	BL02	UMCf	96.0 - 106.0	141,000	2,400,000	<24,000	<117	<700	63.7 J	749,000	3,170	410,000	112,000	112,000	<8,450	<8,450	149 J	<1.03	9.66	56.0	<0.330	<0.150	338,000	4,940	<0.840	<1.51	
U4-MW-15D	12/5/2022	N	EM04	UMCf	96.0 - 106.0	75,300	1,220,000	<24,000	<117	<140	<33.3 UJ	458,000	1,220	225,000	108,000	108,000	<8,450	<8,450	<56.1	<1.03	10.6	49.7	<0.330	<0.150	208,000	3,170	<0.840	<1.51	
U4-MW-15DD	4/13/2022	N	BL02	UMCf	120.3 - 130.3	1,380	19,700	<2,400	<117	<140	<33.3	152,000	878	214,000	108,000	100,000	<8,450	<8,450	<56.1	<1.03	18.8	21.3	<0.330	<0.150	34,000	64.4	<0.840	2.23 J	
U4-MW-15DD	12/5/2022	N	EM04	UMCf	120.3 - 130.3	20.1	1,580	<240	142 J	<140	36.9 J	144,000	1,260	177,000	82,600	77,800	<8,450	<8,450	<56.1	<1.03	16.8	25.2	<0.330	<0.150	32,300	16.3	<0.840	<1.51	
U4-MW-15I	4/12/2022	N	BL02	UMCf	76.8 - 86.8	86,400	1,190,000	<24,000	<117	<140	85.9 J	420,000	5,590	1,070,000	233,000	---	---	---	<56.1	<1.03	31.1	20.5 J+	<0.330	<0.150	127,000	5,510	<0.840	<1.51	
U4-MW-15I	12/5/2022	N	EM04	UMCf	76.8 - 86.8	84,200	862,000	<24,000	<117	<140	45.5 J	500,000	827	875,000	486,000	486,000	<8,450	<8,450	<56.1	1.24 J	44.9	24.9	<0.330	<0.150	163,000	5,040	<0.840	<1.51	
U4-MW-15S	4/13/2022	N	BL02	UMCf	54.8 - 64.8	3,800	36,100	<24.0	<117	<140	74.6 J	178,000	2,750	1,190,000	100,000	100,000	<8,450	<8,450	112 J	<1.03	35.0	21.0	<0.330	<0.150	166,000 J	268 J	<0.840	<1.51	
U4-MW-15S	12/5/2022	N	EM04	UMCf	54.8 - 64.8	663	<24,000	70,700	<117	2,030	143 J-	137,000	132	212,000	650,000	650,000	<8,450	<8,450	186 J	<1.03	49.4	419	<0.330	<0.150	197,000	16.9	<0.840	<1.51	
U4-MW-16D	4/11/2022	N	BL02	UMCf	96.8 - 106.8	1,670,000	15,000,000	<240,000	<117	<2,800	33.3 R	3,030,000	39,300	722,000	119,000	119,000	<8,450	<8,450	<56.1	<10.3	7.23 J	191	<0.330	<1.50	474,000	12,600	<0.840	<15.1	
U4-MW-16D	12/5/2022	N	EM04	UMCf	96.8 - 106.8	974,000	5,970,000	<240,000	<117 UJ	<700	<33.3 UJ	1,740,000	17,100	573,000	259,000	259,000	<8,450	<8,450	<56.1	<1.03	1.92 J	94.1	<0.330	<0.150	149,000	27,600	<0.840	<1.51	
U4-MW-16DD	4/12/2022	N	BL02	UMCf	120.8 - 130.8	77,900	396,000	<240	<117	<140	87.1 J	229,000	569	623,000	94,500	---	---	---	<56.1	<1.03	20.0	24.7 J+	<0.330	<0.150	114,000	922	<0.840	2.29 J	
U4-MW-16DD	12/5/2022	N	EM04	UMCf	120.8 - 130.8	49,600	146,000	<24,000	<117	<140	<33.3 UJ	188,000	260	444,000	99,100	99,100	<8,450	<8,450	<56.1	<1.03	21.7	23.1	<0.330	<0.150	77,200	203	<0.840	<1.51	
U4-MW-16I	4/11/2022	N	BL02	UMCf	77.0 - 87.0	366,000	1,820,000	<24,000	<117	<700	33.3 R	546,000	6,600	979,000	60,000	42,800	17,200 J	<8,450	<8,450	<56.1	<1.03	11.2	38.6	<0.330	<0.150	231,000	8,620	<0.840	<1.51
U4-MW-16I	12/5/2022	N	EM04	UMCf	77.0 - 87.0	205	<2,400	<24,000	<117	943	<33.3 UJ	147,000	72.8 J	195,000	1,030,000	1,030,000	<8,450	<8,450	<56.1	<1.03	69.5	182	<0.330	<0.150	153,000	10.9	<0.840	<1.51	
U4-MW-16I	12/5/2022	FD	EM04	UMCf	77.0 - 87.0	263	<24,000	82,400	<117 UJ	956	<33.3 UJ	144,000	73.1 J	179,000	1,060,000	1,060,000	<8,450	<8,450	<56.1	<1.03	52.5	184	<0.330	<0.150	147,000	11.4	<0.840	<1.51	
U4-MW-16S	4/12/2022	N	BL02	UMCf	54.8 - 64.8	9,400	64,100	<240	<117	<140	<33.3	173,000	2,700	1,150,000	64,800														

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Dissolved Metals by SW6020	Dissolved Metals by SW6010B											FIELD TESTS											
							Zinc	Aluminum	Barium	Beryllium	Calcium	Chromium	Cobalt	Iron	Magnesium	Manganese	Molybdenum	Phosphorus	Potassium	Sodium	Vanadium	Conductivity	Dissolved Oxygen	Ferrous Iron	Oxidation-Reduction Potential	pH	Purge Rate	Sulfide	Temperature
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mS/cm	mg/L	mg/L	mV	SU	mL/min	mg/L	C
M-247-100	4/20/2022	N	BL02	UMCf	100.5 - 110.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.956	1.80	0.0 U	22.9	8.02	190	0.0 U	26.9		
M-249-100	4/20/2022	N	BL02	UMCf	99.6 - 109.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	34.552	0.56	0.0 U	140.6	6.99	120	0.0 U	27.5		
M-251-100	4/19/2022	N	BL02	UMCf	92.5 - 102.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	42.112	1.63	0.0 U	212.1	7.36	100	0.0 U	26.3		
M-251-100	10/13/2022	N	EM02	UMCf	92.5 - 102.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	16.998	4.13	---	172.0	7.19	280	---	24.9		
M-251-100	11/2/2022	N	EM03	UMCf	92.5 - 102.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	18.268	4.61	---	118.7	7.71	250	---	24.1		
M-251-100	12/8/2022	N	EM04	UMCf	92.5 - 102.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	19.870	4.83	---	123.6	7.38	100	---	22.0		
M-251-100	1/11/2023	N	EM05	UMCf	92.5 - 102.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9.502	5.52	---	132.4	7.49	250	---	23.0		
M-251-60	4/18/2022	N	BL02	UMCf	52.3 - 62.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.163	5.64	0.0 U	44.4	10.69	100	0.0 U	30.5		
M-252	4/21/2022	N	BL02	UMCf	132.3 - 142.3	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.053	5.66	0.0 U	142.6	8.13	100	0.0 U	29.6		
M-253-100	4/20/2022	N	BL02	UMCf	100.8 - 110.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.393	3.04	0.0 U	36.4	8.03	60	0.0 U	25.2		
M-255-100	4/20/2022	N	BL02	UMCf	100.2 - 110.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.198	1.87	0.0 U	175.7	7.89	100	0.0 U	25.1		
U4-E-01D	4/18/2022	N	BL02	UMCf	94.7 - 109.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	42.734	0.85	0.0 U	167.3	7.78	100	0.0 U	26.2		
U4-E-01I	4/19/2022	N	BL02	UMCf	74.6 - 89.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.072	9.17	0.0 U	120.6	8.70	100	0.0 U	26.5		
U4-E-02D	4/20/2022	N	BL02	UMCf	94.4 - 109.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9.255	0.62	0.0 U	129.9	7.36	130	0.0 U	27.0		
U4-E-02I	4/18/2022	N	BL02	UMCf	74.4 - 89.4	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9.309	4.25	0.0 U	190.6	8.46	105	0.0 U	24.6		
U4-E-03D	4/19/2022	N	BL02	UMCf	95.1 - 110.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	36.139	0.68	0.0 U	96.0	7.14	200	0.0 U	28.6		
U4-E-03D	10/13/2022	N	EM02	UMCf	95.1 - 110.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
U4-E-03D	11/3/2022	N	EM03	UMCf	95.1 - 110.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	16.802	4.86	---	109.3	7.34	---	---	17.8		
U4-E-03D	12/6/2022	N	EM04	UMCf	95.1 - 110.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11.752	6.10	---	198.2	7.40	---	---	22.1		
U4-E-03D	1/9/2023	N	EM05	UMCf	95.1 - 110.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9.776	7.80	---	117.4	7.79	---	---	21.2		
U4-E-04D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	22.249	1.29	0.0 U	34.2	7.19	70	0.0 U	25.5		
U4-E-04I	4/18/2022	N	BL02	UMCf	75.0 - 90.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4.524	0.84	0.0 U	-18.2	8.40	70	0.0 U	27.4		
U4-E-05D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	26.037	3.43	0.0 U	177.7	7.33	100	0.0 U	28.8		
U4-E-05I	4/19/2022	N	BL02	UMCf	75.0 - 90.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.209	0.59	0.0 U	101.8	8.45	100	0.0 U	28.4		
U4-E-06D	4/11/2022	N	BL02	UMCf	95.1 - 110.1	<18.0	<0.849	255,000 J	19.9	3.31 J	5.53	25.3 J	32,800 J	2.53	<0.0700	1,310,000	<0.121	5.59	<4.99	5.24 J	9.911	2.39	0.0 U	138.8	7.24	90	0.0 U	23.5	
U4-E-06I	4/11/2022	N	BL02	UMCf	73.2 - 88.2	<18.0	<0.849	88,400	8.86 J	13.6	<0.816	45.1 J	23,300	2.37	<0.0700	624,000	<0.121	7.83	17.4 J	4.73 J	4.282	2.10	0.0 U	128.1	7.47	90	0.0 U	25.8	
U4-E-06I	4/11/2022	FD	BL02	UMCf	73.2 - 88.2	<18.0	<0.849	87,900	8.46 J	13.9	<0.816	46.2 J	23,200	2.53	<0.0700	622,000	<0.121	7.85	15.5 J	5.71 J	---	---	---	---	---	---	---		
U4-E-06I	10/12/2022	N	EM02	UMCf	73.2 - 88.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
U4-E-06I	11/3/2022	N	EM03	UMCf	73.2 - 88.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
U4-E-06I	12/6/2022	N	EM04	UMCf	73.2 - 88.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.809	2.83	---	-204.0	6.62	---	---	23.2		
U4-E-06I	1/9/2023	N	EM05	UMCf	73.2 - 88.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	3.965	55.80	---	111.2	6.81	---	---	23.0		
U4-E-07D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	<90.0	<8.49	634,000	22.5 J	8.85 J	<8.16	<91.5	74,800	9.10 J	<0.700	5,760,000	<1.21	5.33 J	<25.0	<30.2	28.599	1.02	0.0 U	134.9	7.20	100	0.0 U	18.5	
U4-E-07I	4/12/2022	N	BL02	UMCf	74.7 - 89.7	<18.0	<0.849	66,000	8.86 J	18.0	1.14 J	194 J	23,400	3.34	<0.0700	1,610,000	<0.121	9.05	45.7	3.42 J	6.791	2.78	0.0 U	164.9	8.12	100	0.0 U	20.2	
U4-E-07I	10/11/2022	N	EM02	UMCf	74.7 - 89.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
U4-E-07I	11/3/2022	N	EM03	UMCf	74.7 - 89.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	14.508	4.32	---	191.3	7.16	---	---	22.3		
U4-E-07I	12/6/2022	N	EM04	UMCf	74.7 - 89.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	13.019	2.90	---	29.1	7.20	---	---	24.0		
U4-E-07I	1/9/2023	N	EM05	UMCf	74.7 - 89.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	7.227	4.15	---	90.9	7.45	---	---	21.9		
U4-E-08D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	<90.0	<8.49	737,000	54.7	10.2 J	<8.16	<91.5	82,200	7.15 J	<0.700	6,200,000	<1.21	7.00 J	<25.0	<30.2	31.747	1.11	0.0 U	185.4	7.17	100	0.0 U	20.2	
U4-E-08D	10/11/2022	N	EM02	UMCf	94.6 - 109.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
U4-E-08D	11/3/2022	N	EM03	UMCf	94.6 - 109.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	22.510	2.00	---	-21.2	6.86	---	---	21.8		
U4-E-08D	12/6/2022	N	EM04	UMCf	94.6 - 109.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	17.697	3.19	---	140.3	7.03	---	---	23.8		
U4-E-08D	1/9/2023	N	EM05	UMCf	94.6 - 109.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10.120	58.00	---	94.3	7.21	---	---	21.7		
U4-E-09D	4/15/2022	N	BL02	UMCf	94.5 - 109.5	18.8 J	<8.49	360,000	23.2	<5.80	<8.16	172 J	46,900	3.01 J	<0.700	1,840,000	<1.21	5.49 J	7.06 J	<30.2	16.373	1.12	0.0 U	131.3	7.20	100	0.0 U	26.7	
U4-E-09I	4/14/2022	N	BL02	UMCf	74.9 - 89.9	<18.0	<0.849	91,600	21.6	13.2	2.61	199 J	25,300	2.47	<0.0700	1,100,000	<0.121	9.29	16.8 J	3.75 J	6.980	5.93	0.0 U	42.3	7.51	100	0.0 U	25.0	
U4-E-10D	4/13/2022	N	BL02	UMCf	94.5 - 109.5	<18.0	<0.849	165,000	7.51 J	8.19	20.5	34.0 J	29,700	2.51	<0.0700	1,120,000	<0.121	1.64	6.53 J	<3.02	8.624	0.77	0.0 U	200.4	8.07	100	0.0 U	23.0	
U4-E-10I	4/13/2022	N	BL02	UMCf	74.2 - 89.2	<18.0	<0.849	133,000	7.93 J	11.6	2.29	<18.3	26,000	2.58	<0.0700	1,410,000	<0.121	10.6	14.5 J	7.05 J	9.367	1.04	0.0 U	223.7	7.20	100	0.0 U	21.6	
U4-MW-01D	4/19/2022	N	BL02	UMCf	96.7 - 106.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	11.556	0.72	0.0 U	130.5	7.14	130	0.0 U	30.0		
U4-MW-01DD	4/19/2022	N	BL02	UMCf	119.9 - 129.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.873	0.81	0.0 U	70.8	7.75	100	0.0 U	33.3		
U4-MW-01DD	4/19/2022	FD	BL02	UMCf	119.9 - 129.9	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
U4-MW-01I	4/19/2022	N	BL02	UMCf	76.7 - 86.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	9.209	0.67	0.0 U	103.3	7.70	220	0.0 U	27.3		
U4-MW-01S	4/18/2022	N	BL02	UMCf	54.7 - 64.7	---	---	---	---	---	---	---	---	---	---	---	---	---	---	4.903	4.81	0.0 U	99.5	8.75	220	0.0 U	27.6		
U4-MW-02D	4/14/2022	N	BL02	UMCf	95.0 - 110.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	47.936	0.74	0.0 U	206.4	7.25	100	0.0 U	26.4		
U4-MW-02D	10/11/2022	N	EM02	UMCf	95.0 - 110.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	82.713	0.99	---	202.1	7.14	280	---	26.1		

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Dissolved Metals by SW6020	Dissolved Metals by SW6010B																	FIELD TESTS						
							Zinc	Aluminum	Barium	Beryllium	Calcium	Chromium	Cobalt	Iron	Magnesium	Manganese	Molybdenum	Phosphorus	Potassium	Sodium	Vanadium	Conductivity	Dissolved Oxygen	Ferrous Iron	Oxidation-Reduction Potential	pH	Purge Rate	Sulfide	Temperature	
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mS/cm	mg/L	mg/L	mV	SU	mL/min	mg/L	C	
U4-MW-05D	10/13/2022	N	EM02	UMCf	98.2 - 108.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	24.933	3.56	---	190.6	7.02	280	---	28.3		
U4-MW-05D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	17.012	4.46	---	121.3	7.64	140	---	23.6		
U4-MW-05D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	16.306	4.72	---	143.6	7.59	0	---	23.1		
U4-MW-05D	1/11/2023	N	EM05	UMCf	98.2 - 108.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10.893	5.62	---	187.0	7.27	250	---	22.5		
U4-MW-05I	4/15/2022	N	BL02	UMCf	76.6 - 86.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	20.080	0.87	0.0 U	140.1	7.54	100	0.0 U	23.2		
U4-MW-05I	10/13/2022	N	EM02	UMCf	76.6 - 86.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	24.065	2.94	---	205.5	7.04	280	---	25.6		
U4-MW-05I	11/3/2022	N	EM03	UMCf	76.6 - 86.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	21.533	3.08	---	130.9	7.57	240	---	24.1		
U4-MW-05I	12/8/2022	N	EM04	UMCf	76.6 - 86.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.258	6.78	---	132.0	7.34	100	---	23.3		
U4-MW-05I	1/11/2023	N	EM05	UMCf	76.6 - 86.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	12.599	4.84	---	192.5	7.29	250	---	23.1		
U4-MW-06D	4/19/2022	N	BL02	UMCf	97.1 - 107.1	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	0.0 U	---	---	---	0.0 U	---		
U4-MW-06I	4/19/2022	N	BL02	UMCf	76.5 - 86.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	6.356	0.75	0.0 U	132.2	8.14	100	0.0 U	27.5	
U4-MW-07D	4/15/2022	N	BL02	UMCf	96.8 - 106.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	10.924	4.48	0.0 U	182.2	7.48	100	0.0 U	26.7		
U4-MW-07D	10/12/2022	N	EM02	UMCf	96.8 - 106.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.057	6.89	---	93.5	7.79	50	---	28.7		
U4-MW-07D	10/12/2022	FD	EM02	UMCf	96.8 - 106.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---		
U4-MW-07D	11/3/2022	N	EM03	UMCf	96.8 - 106.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.730	6.43	---	111.1	7.85	200	---	23.9	
U4-MW-07D	12/7/2022	N	EM04	UMCf	96.8 - 106.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.462	8.66	---	106.4	7.83	100	---	23.8	
U4-MW-07D	1/11/2023	N	EM05	UMCf	96.8 - 106.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.736	11.30	---	105.0	7.74	120	---	24.3	
U4-MW-07I	4/15/2022	N	BL02	UMCf	76.8 - 86.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	5.556	0.59	0.0 U	158.2	7.86	100	0.0 U	25.6	
U4-MW-07I	10/12/2022	N	EM02	UMCf	76.8 - 86.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	2.078	6.24	---	135.0	7.86	50	---	26.9	
U4-MW-07I	11/3/2022	N	EM03	UMCf	76.8 - 86.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.794	6.05	---	141.5	7.93	180	---	23.9	
U4-MW-07I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.562	8.32	---	96.7	7.97	100	---	24.0	
U4-MW-07I	1/11/2023	N	EM05	UMCf	76.8 - 86.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	1.955	9.11	---	104.4	7.82	150	---	24.3	
U4-MW-08D	4/13/2022	N	BL02	UMCf	98.6 - 108.6	<90.0	<8.49	707,000	37.2 J	11.9 J	<8.16	<91.5	102,000	7.61 J	<0.700	7,950,000	<1.21	10.1	<25.0	<30.2	43.677	1.07	0.0 U	166.4	6.92	100	0.0 U	24.7		
U4-MW-08D	12/7/2022	N	EM04	UMCf	98.6 - 108.6	<140	<4.24	330,000	11.7 J	3.10 J	<4.08	---	43,000	4.50 J	<0.350	3,880,000	<0.605	24.7	6.96 J	<15.1	15.745	1.70	0.0 U	52.2	6.62	250	0.0 U	22.4		
U4-MW-08DD	4/20/2022	N	BL02	UMCf	119.8 - 129.8	<18.0	<0.849	28,400	14.7	9.57	1.49 J	110 J	11,000	2.68	<0.0700	258,000	<0.121	3.24	10.4 J	<3.02	1.774	0.95	0.0 U	5.0	7.70	70	0.0 U	24.6		
U4-MW-08DD	4/20/2022	FD	BL02	UMCf	119.8 - 129.8	<18.0	<0.849	28,400	14.6	9.89	1.44 J	107 J	11,100	2.31	<0.0700	258,000	<0.121	3.20	9.34 J	<3.02	---	---	---	---	---	---	---	---		
U4-MW-08DD	12/8/2022	N	EM04	UMCf	119.8 - 129.8	<28.1	<0.849	23,100	31.7	10.9	3.15	---	9,950	2.00	<0.0700	179,000	<0.121	3.17	8.61	23.0 J	1.034	1.20	0.0 U	138.4	7.44	200	0.0 U	21.4		
U4-MW-08I	4/13/2022	N	BL02	UMCf	78.0 - 88.0	<18.0	<0.849	44,400	5.20 J	18.7	0.820 J	25.4 J	23,000	2.69	<0.0700	1,300,000	<0.121	6.55	23.5	3.30 J	8.786	1.97	0.0 U	183.3	7.71	100	0.0 U	22.8		
U4-MW-08I	12/7/2022	N	EM04	UMCf	78.0 - 88.0	<140	<4.24	166,000	29.6	12.8 J	113	---	36,600	3.16 J	<0.350	2,570,000	<0.605	23.7	18.2 J	<15.1	8.950	2.32	0.0 U	137.7	7.48	250	0.0 U	22.7		
U4-MW-08I	12/7/2022	FD	EM04	UMCf	78.0 - 88.0	<140	<4.24	163,000	28.6	12.7 J	106	---	36,200	3.40 J	<0.350	2,540,000	<0.605	23.2	18.3 J	<15.1	---	---	---	---	---	---	---	---		
U4-MW-08S	4/15/2022	N	BL02	UMCf	54.9 - 64.9	26.0 J	<0.849	3,570	<0.934	20.1	<0.816	<18.3	20,400	2.19	<0.0700	580,000	<0.121	0.591 J	47.5	<3.02	3.391	3.42	0.0 U	79.6	9.96	285	0.0 U	27.1		
U4-MW-08S	12/7/2022	N	EM04	UMCf	54.9 - 64.9	31.9 J	<0.849	30,800	10.2	20.4	3.02	---	18,200	1.95 J	<0.0700	624,000	<0.121	13.4	49.2	<3.02	2.838	2.17	0.0 U	40.0	8.08	250	0.0 U	22.4		
U4-MW-08S	12/7/2022	FD	EM04	UMCf	54.9 - 64.9	39.7 J	<0.849	30,800	10.5	20.0	2.30	---	17,900	1.80 J	<0.0700	612,000	<0.121	13.2	48.5	4.34 J	---	---	---	---	---	---	---	---		
U4-MW-09D	4/14/2022	N	BL02	UMCf	96.9 - 106.9	<18.0	<8.49	532,000	4.62 J	<1.16	<18.3	6,610	3.90 J	<0.700	475,000	<1.21	10.2	<4.99	165 J	25.834	1.79	0.0 U	36.4	7.03	100	0.0 U	24.3			
U4-MW-09D	12/6/2022	N	EM04	UMCf	96.9 - 106.9	<28.1 UJ	<0.849 UJ	71,500	5.78	6.30	11.1	---	12,100	1.98 J	<0.0700 UJ	680,000	<0.121 UJ	9.26	23.1	<3.02 UJ	3.375	6.84	0.0 U	104.4	7.69	200	0.0 U	22.1		
U4-MW-09DD	4/14/2022	N	BL02	UMCf	119.8 - 129.8	18.0 J	<0.849	20,000	7.39 J	9.61	<0.816	221 J	7,460	1.98 J	<0.0700	181,000	<0.121	2.98	9.16 J	3.03 J	1.339	1.49	0.0 U	144.1	7.81	100	0.0 U	23.2		
U4-MW-09DD	12/6/2022	N	EM04	UMCf	119.8 - 129.8	<28.1 UJ	<0.849 UJ	21,100	1.17 J	9.02	<0.816 UJ	---	7,030	1.86 J	<0.0700 UJ	162,000	<0.121 UJ	3.11	10.6	<3.02 UJ	1.036	1.23	0.0 U	63.9	7.85	250	0.0 U	22.6		
U4-MW-09I	4/14/2022	N	BL02	UMCf	76.8 - 86.8	<18.0	<0.849	42,300	4.58 J	13.2	0.971 J	172 J	19,300	2.24	<0.0700	588,000	<0.121	5.48	19.1 J	<3.02	3.354	10.37	0.0 U	8.8	7.57	120	0.0 U	24.5		
U4-MW-09I	12/6/2022	N	EM04	UMCf	76.8 - 86.8	<140 UJ	<4.24 UJ	100,000	21.9 J	7.84 J	83.7	---	20,600	2.26 J	<0.350 UJ	1,150,000	<0.605 UJ	10.8	10.7 J	<15.1 UJ	4.939	5.28	0.0 U	124.5	7.49	250	0.0 U	22.6		
U4-MW-09S	4/14/2022	N	BL02	UMCf	55.3 - 65.3	141	<0.849	30,200	5.72 J	19.0	<0.816	168 J	14,000	2.13	<0.0700	461,000	<0.121	6.57	36.3	<3.02	2.893	4.00	0.0 U	179.7	8.27	160	0.0 U	23.4		
U4-MW-09S	12/6/2022	N	EM04	UMCf	55.3 - 65.3	<28.1 UJ	<0.849 UJ	7,810	1.21 J	14.0	1.83 J	---	9,350	2.30	<0.0700 UJ	841,000	<0.121 UJ	4.45	67.2	<3.02 UJ	3.158	5.76	0.0 U	73.5	8.69	250	0.0 U	21.6		
U4-MW-10D	4/14/2022	N	BL02	UMCf	96.9 - 106.9	<18.0	<0.849	134,000	23.5	8.67	<0.816	32.2 J	24,200	2.14	<0.0700	626,000	<0.121	9.13	8.78 J	3.53 J	5.411	0.91	0.0 U	206.3	7.33	100	0.0 U	22.6		
U4-MW-10D	12/5/2022	N	EM04	UMCf	96.9 - 106.9	<18.0	<0.849	87,500	2.32 J	3.34 J	<0.816	---	15,500	2.22	<0.0700	---	<0.121	5.41	7.55 J	<3.02	2.690	3.80	0.0 U	70.0	7.73	100	0.0 U	22.9		
U4-MW-10I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	27.9 J	<0.849	135,000	25.2	17.8	1.08 J	194 J	31,700	2.88	<0.0700	995,000	0.490 J	6.45	9.70 J	4.88 J	7.650	0.90	0.0 U	183.9	7.68	100	0.0 U	23.9		
U4-MW-10I	12/5/2022	N	EM04	UMCf	77.1 - 87.1	<18.0	<0.849	87,800	34.4	16.9	<0.816	---	17,000	2.24	<0.0700	---	<0.121	11.5	16.8 J	<3.02	2.740	0.62	0.0 U	9.6	7.73	100	0.0 U	23.2		
U4-MW-11D	4/15/2022	N	BL02	UMCf	97.4 - 107.4	<90.0	<8.49	652,000	68.0	17.8 J	<8.16	315 J	86,800	6.05 J	<0.700	5,920,000	<1.21	5.93 J	<25.0	<30.2	31.458	0.75	0.0 U	194.9	7.12	100	0.0 U	23.3		

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Dissolved Metals by SW6020	Dissolved Metals by SW6010B																FIELD TESTS							
							Zinc	Aluminum	Barium	Beryllium	Calcium	Chromium	Cobalt	Iron	Magnesium	Manganese	Molybdenum	Phosphorus	Potassium	Sodium	Vanadium	Conductivity	Dissolved Oxygen	Ferrous Iron	Oxidation-Reduction Potential	pH	Purge Rate	Sulfide	Temperature	
							µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	mS/cm	mg/L	mg/L	mV	SU	mL/min	mg/L	C	
U4-MW-12I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<28.1	<0.849	44,500	264	15.7	2.09	----	16,700	0.587 J	<0.0700	490,000	<0.121	41.0	6.05	<3.02	2.533	1.36	0.0 U	-290.6	7.38	80	0.6	20.5		
U4-MW-12I	12/7/2022	FD	EM04	UMCf	76.8 - 86.8	41.2 J	<0.849	44,600	264	16.2	3.19	----	16,800	0.457 J	<0.0700	499,000	<0.121	41.4	6.27	<3.02	----	----	----	----	----	----	----	----		
U4-MW-12I	1/13/2023	N	EM05	UMCf	76.8 - 86.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	0.0 U	----	----	----	0.0 U	----		
U4-MW-13D	4/14/2022	N	BL02	UMCf	98.2 - 108.2	<90.0	<8.49	664,000	32.9 J	9.95 J	<8.16	140 J	71,200	4.11 J	<0.700	3,990,000	<1.21	10.8	<25.0	<30.2	32.518	0.90	0.0 U	136.1	6.94	100	0.0 U	25.2		
U4-MW-13D	9/28/2022	N	EM01	UMCf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	11.793	0.96	0.0 U	-329.7	6.65	100	0.0 U	28.9		
U4-MW-13D	10/11/2022	N	EM02	UMCf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	11.124	1.77	0.0 U	-147.3	6.57	50	0.0 U	23.5		
U4-MW-13D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.404	1.67	0.0 U	26.5	6.45	250	0.0 U	21.5		
U4-MW-13D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	<140	<4.24	276,000	92.8	2.40 J	<4.08	----	26,600	2.64 J	<0.350	1,170,000	<0.605	34.4	4.77 J	<15.1	7.937	2.99	0.0 U	122.7	6.70	80	0.0 U	16.8		
U4-MW-13D	1/12/2023	N	EM05	UMCf	98.2 - 108.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	4.505	1.39	0.0 U	60.0	6.88	250	0.0 U	21.4		
U4-MW-13I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	<18.0	<0.849	169,000	28.6	13.8	1.80 J	132 J	33,100	3.82	<0.0700	1,640,000	<0.121	7.29	9.14 J	<3.02	11.607	2.38	0.0 U	127.9	7.42	100	0.0 U	23.7		
U4-MW-13I	9/28/2022	N	EM01	UMCf	77.1 - 87.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	5.667	2.79	0.0 U	96.9	7.52	100	0.0 U	27.2		
U4-MW-13I	10/10/2022	N	EM02	UMCf	77.1 - 87.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	6.053	1.93	0.0 U	110.0	7.58	50	0.0 U	27.9		
U4-MW-13I	11/3/2022	N	EM03	UMCf	77.1 - 87.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.675	2.64	0.0 U	141.8	7.46	250	0.0 U	20.1		
U4-MW-13I	12/6/2022	N	EM04	UMCf	77.1 - 87.1	32.3 J	<0.849 UJ	48,300	161	9.01	2.47	----	16,700	1.08 J	<0.0700 UJ	759,000	<0.121 UJ	38.3	7.72	<3.02 UJ	3.613	1.73	0.0 U	-292.7	7.58	100	0.1	19.9		
U4-MW-13I	1/12/2023	N	EM05	UMCf	77.1 - 87.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	2.079	1.19	0.0 U	-245.9	7.13	250	0.0 U	20.1		
U4-MW-14D	4/13/2022	N	BL02	UMCf	97.3 - 107.3	<18.0	<0.849	152,000	79.2	41.2	9.04	<18.3	25,400	3.31	<0.0700	673,000	<0.121	18.5	22.2	<3.02	5.770	0.87	0.0 U	161.5	7.20	100	0.0 U	26.5		
U4-MW-14D	12/6/2022	N	EM04	UMCf	97.3 - 107.3	40.3 J	1.09 J	128,000	21.5	5.90	<0.816 UJ	----	19,100	2.46	<0.0700 UJ	469,000	0.156 J	8.22	14.1	<3.02 UJ	4.415	2.55	0.0 U	75.3	7.39	80	0.0 U	20.7		
U4-MW-14I	4/14/2022	N	BL02	UMCf	77.3 - 87.3	<18.0	<0.849	52,400	19.0	16.2	1.09 J	191 J	25,400	2.53	<0.0700	596,000	<0.121	4.68	13.3 J	<3.02	5.720	0.77	0.0 U	110.5	8.07	150	0.0 U	22.8		
U4-MW-14I	12/6/2022	N	EM04	UMCf	77.3 - 87.3	<28.1 UJ	<0.849 UJ	139,000	32.4	9.57	1.12 J	----	22,000	2.86	<0.0700 UJ	518,000	0.243 J	15.3	14.3	<3.02 UJ	4.279	2.18	0.0 U	63.8	7.41	80	0.0 U	16.8		
U4-MW-15D	4/13/2022	N	BL02	UMCf	96.0 - 106.0	21.8 J	<0.849	157,000	26.1	9.77	0.944 J	<18.3	25,500	2.38	<0.0700	646,000	0.186 J	13.6	8.06 J	<3.02	5.015	1.02	0.0 U	209.2	7.09	100	0.0 U	20.7		
U4-MW-15D	12/5/2022	N	EM04	UMCf	96.0 - 106.0	<18.0	<0.849	92,400	10.3	6.33	<0.816	----	18,700	2.23	<0.0700	436,000	<0.121	11.6	7.40 J	<3.02	2.298	15.40	0.0 U	168.4	7.52	200	0.0 U	22.3		
U4-MW-15DD	4/13/2022	N	BL02	UMCf	120.3 - 130.3	162	<0.849	15,400	2.57 J	10.4	2.78	<18.3	6,830	2.15	<0.0700	159,000	<0.121	4.23	17.9 J	<3.02	0.999	2.14	0.0 U	123.8	8.36	100	0.0 U	18.6		
U4-MW-15DD	12/5/2022	N	EM04	UMCf	120.3 - 130.3	<18.0	<0.849	16,800	5.61 J	7.88	31.6	----	6,430	1.91 J	<0.0700	----	<0.121	3.37	12.9 J	<3.02	0.666	2.14	0.0 U	-139.8	8.59	250	0.0 U	21.5		
U4-MW-15I	4/12/2022	N	BL02	UMCf	76.8 - 86.8	24.4 J	<0.849	56,500	14.9	17.8	<0.816	25.2 J	22,300	2.64	<0.0700	897,000	<0.121	6.59	18.7 J	<3.02	5.348	1.45	0.0 U	125.1	7.95	150	0.0 U	22.6		
U4-MW-15I	12/5/2022	N	EM04	UMCf	76.8 - 86.8	<18.0	<0.849	73,800	61.8	11.5	2.11	----	22,500	2.82	0.105 J	976,000	0.663 J	52.3	14.2 J	<3.02	2.972	1.05	0.0 U	161.9	6.87	250	0.0 U	23.0		
U4-MW-15S	4/13/2022	N	BL02	UMCf	54.8 - 64.8	95.9 J	<0.849	50,100 J	2.61 J	19.2	<0.816	50.3 J	15,200 J	2.71	<0.0700	387,000 J	<0.121	4.94	23.5	<3.02	2.466	5.73	0.0 U	165.2	8.11	200	0.0 U	21.5		
U4-MW-15S	12/5/2022	N	EM04	UMCf	54.8 - 64.8	3,440	<0.849	61,300	465	1.18 J	2.37	----	33,300	0.690 J	<0.0700	277,000	<0.121	6.64	21.0	<3.02	1.328	0.91	0.0 U	-309.1	5.99	250	0.0 U	22.0		
U4-MW-16D	4/11/2022	N	BL02	UMCf	96.8 - 106.8	<18.0	<8.49	240,000	12.4	4.62 J	<8.16	<18.3	30,600	5.89 J	<0.700	1,210,000	<1.21	6.64 J	<4.99	44.4 J	27.119	4.03	0.0 U	165.2	7.15	100	0.0 U	23.7		
U4-MW-16D	12/5/2022	N	EM04	UMCf	96.8 - 106.8	<18.0	<0.849	318,000	25.7	11.8	<0.816 UJ	----	8,140	0.707 J	<0.0700	522,000	<0.121	5.45	<4.99	<3.02	14.259	2.61	0.0 U	63.9	7.13	80	0.0 U	21.8		
U4-MW-16DD	4/12/2022	N	BL02	UMCf	120.8 - 130.8	25.5 J	<0.849	48,200	11.0	13.8	0.870 J	<18.3	12,500	3.05	<0.0700	390,000	<0.121	7.68	18.9 J	5.37 J	2.380	1.10	0.0 U	121.7	7.62	100	0.0 U	18.3		
U4-MW-16DD	12/5/2022	N	EM04	UMCf	120.8 - 130.8	<18.0	<0.849	36,000	7.25 J	12.6	<0.816	----	10,300	2.31	<0.0700	----	<0.121	7.92	14.0 J	<3.02	1.722	1.93	0.0 U	43.7	7.71	100	0.0 U	21.7		
U4-MW-16I	4/11/2022	N	BL02	UMCf	77.0 - 87.0	<18.0	<0.849	76,200	2.20 J	13.7	<0.816	<18.3	30,800	2.58	<0.0700	968,000	<0.121	2.26	<4.99	3.91 J	6.673	8.63	0.0 U	129.8	8.36	200	0.0 U	23.5		
U4-MW-16I	12/5/2022	N	EM04	UMCf	77.0 - 87.0	33.5 J	<0.849	85,400	629	5.24	7.02	----	25,600	<0.300	<0.0700	----	<0.121	65.4	7.90 J	6.02 J	2.618	1.36	0.0 U	-277.0	7.32	60	0.5	22.2		
U4-MW-16I	12/5/2022	FD	EM04	UMCf	77.0 - 87.0	33.8 J	<0.849	86,100	634	5.43	4.10 J	----	24,600	<0.300	<0.0700	----	<0.121	62.1	5.85 J	<3.02	----	----	----	----	----	----	----	----		
U4-MW-16S	4/12/2022	N	BL02	UMCf	54.8 - 64.8	<18.0	<0.849	37,500	2.69 J	18.3	<0.816	28.9 J	18,500	2.47	<0.0700	409,000	<0.121	3.64	15.4 J	<3.02	2.712	4.29	0.0 U	136.6	8.80	200	0.0 U	22.3		
U4-MW-16S	4/12/2022	FD	BL02	UMCf	54.8 - 64.8	<18.0	<0.849	37,700	2.07 J	18.4	<0.816	25.5 J	18,300	2.96	<0.0700	405,000	<0.121	3.66	14.3 J	<3.02	----	----	----	----	----	----	----	----		
U4-MW-16S	12/6/2022	N	EM04	UMCf	54.8 - 64.8	<28.1 UJ	<0.849 UJ	57,200	19.9	40.2	<0.816 UJ	----	16,000	1.13 J	<0.0700 UJ	386,000	<0.121 UJ	12.5	7.59	<3.02 UJ	2.562	1.29	0.0 U	24.7	8.01	120	0.0 U	22.5		
U4-SLMW	11/10/2022	N	EM03																											
U4-T3	10/13/2022	N	EM02																											
U4-T3	11/3/2022	N	EM03																											
U4-T3	12/6/2022	N	EM04																											
U4-T3	1/9/2023	N	EM05																											

Notes:  
 FD - Field duplicate  
 E - Field instrument error.  
 J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.  
 J- - The result is an estimated quantity, but the result may be biased low.  
 J+ - The result is an estimated quantity, but the result may be biased high.  
 mg/L - milligrams per liter  
 µg/L - micrograms per liter  
 N - Normal field sample  
 R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.  
 UMCf- Upper Muddy Creek Formation  
 < - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.  
 -- Not tested.

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	FIELD TESTS	RSK175			SM2540C	SW7199	Volatile Organic Compounds by SW8260B													
							Turbidity	Ethane	Ethene	Methane	Total Dissolved Solids	Chromium, Hexavalent	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-Chloropropane	
						NTU	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	
M-247-100	4/20/2022	N	BL02	UMCF	100.5 - 110.5	22.0	---	---	---	712,000	<150	---	---	---	---	---	---	---	---	---	---	---	---	---	---
M-249-100	4/20/2022	N	BL02	UMCF	99.6 - 109.6	60.6	---	---	---	54,000,000	77,000	---	---	---	---	---	---	---	---	---	---	---	---	---	---
M-251-100	4/19/2022	N	BL02	UMCF	92.5 - 102.5	17.1	---	---	---	39,900,000	96,900 J	<0.147	<0.149	<0.133	<0.158	0.204 J	0.484 J	<0.142	<0.230	0.428 J	<0.481	<0.322	<0.276	<0.276	
M-251-100	10/13/2022	N	EM02	UMCF	92.5 - 102.5	58.8	---	---	---	25,800,000	57,600	<0.147	<0.149	<0.133	<0.158	<0.100	0.398 J	0.297 J	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
M-251-100	11/2/2022	N	EM03	UMCF	92.5 - 102.5	33.2	---	---	---	18,700,000	39,500	<1.47	<1.49	<1.33	<1.58	<1.00	<1.88	<1.42	<2.30	<2.37	<4.81	<3.22	<2.76	<2.76	
M-251-100	12/8/2022	N	EM04	UMCF	92.5 - 102.5	17.3	---	---	---	15,000,000 J	32,300	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
M-251-100	1/11/2023	N	EM05	UMCF	92.5 - 102.5	50.5	---	---	---	22,400,000	43,900	<0.147	<0.149	<0.133	<0.158	<0.100	0.206 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
M-251-60	4/18/2022	N	BL02	UMCF	52.3 - 62.3	18.3	---	---	---	2,330,000 J	1,510 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
M-252	4/21/2022	N	BL02	UMCF	132.3 - 142.3	9.9	---	---	---	1,410,000	32.5 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
M-253-100	4/20/2022	N	BL02	UMCF	100.8 - 110.8	21.0	---	---	---	2,130,000	598	---	---	---	---	---	---	---	---	---	---	---	---	---	
M-255-100	4/20/2022	N	BL02	UMCF	100.2 - 110.2	12.0	---	---	---	1,600,000	1,350	---	---	---	---	---	---	---	---	---	---	---	---	---	
U4-E-01D	4/18/2022	N	BL02	UMCF	94.7 - 109.7	8.7	---	---	---	43,600,000	87,000 J	<0.735	<0.745	<0.665	<0.790	<0.500	<0.940	<0.710	<1.15	<1.19	<2.41	<1.61	<1.38	<1.38	
U4-E-01I	4/19/2022	N	BL02	UMCF	74.6 - 89.6	2.7	---	---	---	4,770,000 J	6,190 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-01I	4/19/2022	FD	BL02	UMCF	74.6 - 89.6	---	---	---	---	2,770,000 J	7,860 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-02D	4/20/2022	N	BL02	UMCF	94.4 - 109.4	2.0	---	---	---	10,800,000	17,400	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-02I	4/18/2022	N	BL02	UMCF	74.4 - 89.4	9.8	---	---	---	4,130,000	8,910 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322 UJ	<0.276	<0.276	
U4-E-03D	4/19/2022	N	BL02	UMCF	95.1 - 110.1	33.2	---	---	---	34,400,000	77,900 J	<0.147	<0.149	<0.133	<0.158	<0.126 J	0.465 J	<0.142	<0.230	0.293 J	<0.481	<0.322	<0.276	<0.276	
U4-E-03D	10/13/2022	N	EM02	UMCF	95.1 - 110.1	---	---	---	---	18,900,000 J	48,700	<29.4	<29.8	<26.6	<31.6	<20.0	<37.6	<28.4	<46.0	<47.4	<96.2	<64.4	<55.2	<55.2	
U4-E-03D	11/3/2022	N	EM03	UMCF	95.1 - 110.1	225.3	---	---	---	15,400,000	44,000	<0.147	<0.149	<0.133	<0.158	<0.100	0.481 J	0.479 J	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-03D	12/6/2022	N	EM04	UMCF	95.1 - 110.1	1.8	---	---	---	16,000,000	37,000 J	<2.94 UJ	<2.98 UJ	<2.66 UJ	<3.16 UJ	<2.00 UJ	<3.76 UJ	<2.84 UJ	<4.60 UJ	<4.74 UJ	<9.62 UJ	<6.44 UJ	<5.52 UJ	<5.52 UJ	
U4-E-03D	1/9/2023	N	EM05	UMCF	95.1 - 110.1	0.0	---	---	---	9,860,000	36,100	<0.147	<0.149	<0.133	<0.158	<0.100	0.264 J	0.273 J	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-04D	4/19/2022	N	BL02	UMCF	95.0 - 110.0	15.1	---	---	---	24,000,000	37,500 J	<0.147	<0.149	<0.133	<0.158	<0.100	0.223 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-04I	4/18/2022	N	BL02	UMCF	75.0 - 90.0	28.9	---	---	---	3,430,000	3,380 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-05D	4/19/2022	N	BL02	UMCF	95.0 - 110.0	45.2	---	---	---	28,400,000	47,900 J	<0.147	<0.149	<0.133	<0.158	<0.100	0.271 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-05I	4/19/2022	N	BL02	UMCF	75.0 - 90.0	10.5	---	---	---	4,070,000	5,710 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-06D	4/11/2022	N	BL02	UMCF	95.1 - 110.1	37.2	<4.07	<4.26	<2.91	9,590,000	10,800	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-06I	4/11/2022	N	BL02	UMCF	73.2 - 88.2	11.6	<4.07	<4.26	<2.91	3,220,000	2,420	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-06I	4/11/2022	FD	BL02	UMCF	73.2 - 88.2	---	<4.07	<4.26	<2.91	3,150,000	3,210	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-06I	10/12/2022	N	EM02	UMCF	73.2 - 88.2	---	---	---	---	9,760,000 J	9,930	<0.147	<0.149	<0.133	<0.158	<0.100	0.210 J	0.258 J	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-06I	11/3/2022	N	EM03	UMCF	73.2 - 88.2	---	---	---	---	5,900,000	3,080	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	0.204 J	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-06I	12/6/2022	N	EM04	UMCF	73.2 - 88.2	38.3	---	---	---	6,870,000	1,860 J	<1.47 UJ	<1.49 UJ	<1.33 UJ	<1.58 UJ	<1.00 UJ	<1.88 UJ	<1.42 UJ	<2.30 UJ	<2.37 UJ	<4.81 UJ	<3.22 UJ	<2.76 UJ	<2.76 UJ	
U4-E-06I	1/9/2023	N	EM05	UMCF	73.2 - 88.2	4.4	---	---	---	7,540,000	17,700	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	0.224 J	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-07D	4/12/2022	N	BL02	UMCF	94.6 - 109.6	16.0	<4.07	<4.26	<2.91	37,900,000	76,300 J	<0.147	<0.149	<0.133	<0.158	<0.100	0.682 J	0.594 J	<0.230	0.393 J	<0.481	<0.322	<0.276	<0.276	
U4-E-07I	4/12/2022	N	BL02	UMCF	74.7 - 89.7	2.8	<4.07	<4.26	<2.91	6,860,000	12,200 J	<0.147	<0.149	<0.133	<0.158	0.122 J	0.424 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-07I	10/11/2022	N	EM02	UMCF	74.7 - 89.7	---	---	---	---	17,000,000	48,700	<1.47	<1.49	<1.33	<1.58	<1.00	<1.88	<1.42	<2.30	<2.37	<4.81	<3.22	<2.76	<2.76	
U4-E-07I	11/3/2022	N	EM03	UMCF	74.7 - 89.7	21294.5	---	---	---	12,800,000	42,300 J	<0.147	<0.149	<0.133	<0.158	<0.100	0.225 J	0.316 J	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-07I	12/6/2022	N	EM04	UMCF	74.7 - 89.7	3.7	---	---	---	15,000,000	38,500	<3.68 UJ	<3.73 UJ	<3.33 UJ	<3.95 UJ	<2.50 UJ	<4.70 UJ	<3.55 UJ	<5.75 UJ	<5.93 UJ	<12.0 UJ	<8.05 UJ	<6.90 UJ	<6.90 UJ	
U4-E-07I	1/9/2023	N	EM05	UMCF	74.7 - 89.7	0.2	---	---	---	11,800,000	39,800	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	0.281 J	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-08D	4/12/2022	N	BL02	UMCF	94.6 - 109.6	3.6	<4.07	<4.26	<2.91	39,500,000	85,100 J	<0.147	<0.149	<0.133	<0.158	<0.100	0.759 J	0.631 J	<0.230	0.429 J	<0.481	<0.322	<0.276	<0.276	
U4-E-08D	10/11/2022	N	EM02	UMCF	94.6 - 109.6	---	---	---	---	24,000,000	69,700	<1.47	<1.49	<1.33	<1.58	<1.00	<1.88	<1.42	<2.30	<2.37	<4.81	<3.22	<2.76	<2.76	
U4-E-08D	11/3/2022	N	EM03	UMCF	94.6 - 109.6	24.9	---	---	---	22,800,000	60,100 J	<0.147	<0.149	<0.133	<0.158	<0.100	0.501 J	0.528 J	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-08D	12/6/2022	N	EM04	UMCF	94.6 - 109.6	-0.4	---	---	---	23,600,000	52,600 J	<3.68 UJ	<3.73 UJ	<3.33 UJ	<3.95 UJ	<2.50 UJ	<4.70 UJ	<3.55 UJ	<5.75 UJ	<5.93 UJ	<12.0 UJ	<8.05 UJ	<6.90 UJ	<6.90 UJ	
U4-E-08D	1/9/2023	N	EM05	UMCF	94.6 - 109.6	0.0	---	---	---	14,100,000	52,500	<0.147	<0.149	<0.133	<0.158	<0.100	0.285 J	0.335 J	<0.230	<0.237	<0.481	<0.322	<0.276	<0.276	
U4-E-09D	4/15/2022	N	BL02	UMCF	94.5 - 109.5	5.2	<4.07	<4.26	<2.91	7,500,000	26,400 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481 UJ	<			

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	FIELD TESTS	RSK175				SM2540C	SW7199	Volatile Organic Compounds by SW8260B													
							Turbidity	Ethane	Ethene	Methane			Total Dissolved Solids	Chromium, Hexavalent	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-Chloropropane
U4-MW-05D	10/13/2022	N	EM02	UMCf	98.2 - 108.2	235.7	---	---	---	80,400,000 J	69,500	<14.7	<14.9	<13.3	<15.8	<10.0	<18.8	<14.2	<23.0	<23.7	<48.1	<32.2	<27.6			
U4-MW-05D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	92823.7	---	---	---	15,100,000	46,500	<0.147	<0.149	<0.133	<0.158	0.118 J	0.278 J	0.297 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	106.9	---	---	---	15,100,000	44,900	<0.147	<0.149	<0.133	<0.158	0.116 J	0.436 J	0.544 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05D	1/11/2023	N	EM05	UMCf	98.2 - 108.2	138.6	---	---	---	10,200,000	44,700	<0.147	<0.149	<0.133	<0.158	0.106 J	0.330 J	0.362 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05I	4/15/2022	N	BL02	UMCf	76.6 - 86.6	2057.3	---	---	---	12,900,000	42,800 J-	<0.147	<0.149	<0.133	<0.158	<0.100	0.359 J	0.311 J	<0.230	<0.237	<0.481 UJ	<0.322	<0.276			
U4-MW-05I	10/13/2022	N	EM02	UMCf	76.6 - 86.6	1860.6	---	---	---	29,100,000	70,800	<14.7	<14.9	<13.3	<15.8	<10.0	<18.8	<14.2	<23.0	<23.7	<48.1	<32.2	<27.6			
U4-MW-05I	11/3/2022	N	EM03	UMCf	76.6 - 86.6	90637.6	---	---	---	22,800,000	61,900 J-	<0.147	<0.149	<0.133	<0.158	0.154 J	0.448 J	0.557 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05I	12/8/2022	N	EM04	UMCf	76.6 - 86.6	1119.7	---	---	---	19,400,000 J	49,600	<0.147	<0.149	<0.133	<0.158	0.135 J	0.345 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-05I	1/11/2023	N	EM05	UMCf	76.6 - 86.6	7501.5	---	---	---	10,300,000	45,300	<0.147	<0.149	<0.133	<0.158	<0.100	0.289 J	0.462 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-06D	4/19/2022	N	BL02	UMCf	97.1 - 107.1	---	---	---	---	43,400,000	73,100 J-	<0.147	<0.149	<0.133	<0.158	0.134 J	0.315 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-06I	4/19/2022	N	BL02	UMCf	76.5 - 86.5	171.5	---	---	---	3,420,000	3,070 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	4/15/2022	N	BL02	UMCf	96.8 - 106.5	52.5	---	---	---	5,820,000	23,900 J+	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481 UJ	<0.322	<0.276			
U4-MW-07D	10/12/2022	N	EM02	UMCf	96.8 - 106.5	9.7	---	---	---	1,310,000 J-	2,080	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	10/12/2022	FD	EM02	UMCf	96.8 - 106.5	---	---	---	---	1,330,000	2,120	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	11/3/2022	N	EM03	UMCf	96.8 - 106.5	97.4	---	---	---	1,220,000 J+	1,610 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	12/7/2022	N	EM04	UMCf	96.8 - 106.5	14.1	---	---	---	1,050,000	1,080 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07D	1/11/2023	N	EM05	UMCf	96.8 - 106.5	22.8	---	---	---	1,260,000	380 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07I	4/15/2022	N	BL02	UMCf	76.8 - 86.8	10.7	---	---	---	1,670,000	4,810 J+	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481 UJ	<0.322	<0.276			
U4-MW-07I	10/12/2022	N	EM02	UMCf	76.8 - 86.8	119.0	---	---	---	1,350,000 J	2,720	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07I	11/3/2022	N	EM03	UMCf	76.8 - 86.8	1667.5	---	---	---	1,340,000	1,650 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	210.3	---	---	---	1,220,000	1,360 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-07I	1/11/2023	N	EM05	UMCf	76.8 - 86.8	73.4	---	---	---	1,440,000	810 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08D	4/13/2022	N	BL02	UMCf	98.6 - 108.6	98.8 E	<4.07	<4.26	<2.91	48,000,000	106,000	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08D	12/7/2022	N	EM04	UMCf	98.6 - 108.6	21.7	<4.07	<4.26	166	14,700,000	52,900 J-	<0.147	<0.149	<0.133	<0.158	<0.100	0.391 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08DD	4/20/2022	N	BL02	UMCf	119.8 - 129.8	62.4	<4.07	<4.26	<2.91	1,240,000	694	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08DD	4/20/2022	FD	BL02	UMCf	119.8 - 129.8	---	<4.07	<4.26	<2.91	1,220,000	723	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08DD	12/8/2022	N	EM04	UMCf	119.8 - 129.8	20.3	<4.07	<4.26	<2.91	751,000 J	384	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08I	4/13/2022	N	BL02	UMCf	78.0 - 88.0	5857914.0 E	<4.07	<4.26	<2.91	3,380,000	7,950	<0.147	<0.149	<0.133	<0.158	<0.100	1.02	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08I	12/7/2022	N	EM04	UMCf	78.0 - 88.0	304.1	<4.07	<4.26	<2.91	11,000,000	33,700	<0.147	<0.149	<0.133	<0.158	<0.100	0.223 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08I	12/7/2022	FD	EM04	UMCf	78.0 - 88.0	---	<4.07	<4.26	55.5	---	34,200 J-	<0.147	<0.149	<0.133	<0.158	<0.100	0.232 J	0.238 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08S	4/15/2022	N	BL02	UMCf	54.9 - 64.9	55.4	<4.07	<4.26	<2.91	1,970,000	506 J+	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481 UJ	<0.322	<0.276			
U4-MW-08S	12/7/2022	N	EM04	UMCf	54.9 - 64.9	182.5	<4.07	<4.26	427	1,600,000	254 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-08S	12/7/2022	FD	EM04	UMCf	54.9 - 64.9	---	<4.07	<4.26	472	1,850,000	265 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-09D	4/14/2022	N	BL02	UMCf	96.9 - 106.9	640.2	<4.07	<4.26	<2.91	30,000,000	67,800	<0.147	<0.149	<0.133	<0.158	<0.100	0.455 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-09D	12/6/2022	N	EM04	UMCf	96.9 - 106.9	305.7	<4.07 UJ	<4.26 UJ	291	3,560,000	7,060 J-	<1.47 UJ	<1.49 UJ	<1.33 UJ	<1.58 UJ	<1.00 UJ	<1.88 UJ	<1.42 UJ	<2.30 UJ	<2.37 UJ	<4.81 UJ	<3.22 UJ	<2.76 UJ			
U4-MW-09DD	4/14/2022	N	BL02	UMCf	119.8 - 129.8	25.6	<4.07	<4.26	<2.91	759,000 J	121	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-09DD	12/6/2022	N	EM04	UMCf	119.8 - 129.8	11.4	<4.07 UJ	<4.26 UJ	<2.91 UJ	693,000	134	<0.147 UJ	<0.149 UJ	<0.133 UJ	<0.158 UJ	<0.100 UJ	<0.188 UJ	<0.142 UJ	<0.230 UJ	<0.237 UJ	<0.481 UJ	<0.322 UJ	<0.276 UJ			
U4-MW-09I	4/14/2022	N	BL02	UMCf	76.8 - 86.8	322.6	<4.07	<4.26	<2.91	2,030,000	2,320	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-09I	12/6/2022	N	EM04	UMCf	76.8 - 86.8	1626.2	<4.07 UJ	<4.26 UJ	194	6,780,000	13,500 J-	<1.47 UJ	<1.49 UJ	<1.33 UJ	<1.58 UJ	<1.00 UJ	<1.88 UJ	<1.42 UJ	<2.30 UJ	<2.37 UJ	<4.81 UJ	<3.22 UJ	<2.76 UJ			
U4-MW-09S	4/14/2022	N	BL02	UMCf	55.3 - 65.3	33.5	<4.07	<4.26	<2.91	1,900,000	387	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-09S	12/6/2022	N	EM04	UMCf	55.3 - 65.3	60.9	<4.07 UJ	<4.26 UJ	<2.91 UJ	3,460,000 J	2,740 J-	<0.147 UJ	<0.149 UJ	<0.133 UJ	<0.158 UJ	<0.100 UJ	<0.188 UJ	<0.142 UJ	<0.230 UJ	<0.237 UJ	<0.481 UJ	<0.322 UJ	<0.276 UJ			
U4-MW-10D	4/14/2022	N	BL02	UMCf	96.9 - 106.9	52.9	<4.07	<4.26	<2.91	4,840,000	5,450	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-10D	12/5/2022	N	EM04	UMCf	96.9 - 106.9	43.2	<4.07	<4.26	257	2,400,000	3,640 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	&lt						

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	FIELD TESTS	RSK175				SM2540C	SW7199	Volatile Organic Compounds by SW8260B													
							Turbidity	Ethane	Ethene	Methane			Total Dissolved Solids	Chromium, Hexavalent	1,1,1,2-Tetrachloroethane	1,1,1-Trichloroethane	1,1,2,2-Tetrachloroethane	1,1,2-Trichloroethane	1,1-Dichloroethane	1,1-Dichloroethene	1,1-Dichloropropene	1,2,3-Trichlorobenzene	1,2,3-Trichloropropane	1,2,4-Trichlorobenzene	1,2,4-Trimethylbenzene	1,2-Dibromo-3-Chloropropane
U4-MW-12I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	20.9	<4.07	<4.26	1,070	1,370,000	<0.150 UJ	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-12I	12/7/2022	FD	EM04	UMCf	76.8 - 86.8	----	<4.07	<4.26	1,110	----	2.33 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-12I	1/13/2023	N	EM05	UMCf	76.8 - 86.8	----	----	----	----	1,580,000	0.446 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-13D	4/14/2022	N	BL02	UMCf	98.2 - 108.2	85.7	<4.07	<4.26	<2.91	30,300,000	56,200	<0.147	<0.149	<0.133	<0.158	<0.100	0.565 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-13D	9/28/2022	N	EM01	UMCf	98.2 - 108.2	50.9	----	----	----	6,280,000 J+	45,000	<1.47	<1.49	<1.33	<1.58	<1.00	<1.88	<1.42	<2.30	<2.37	<4.81	<3.22	<2.76			
U4-MW-13D	10/11/2022	N	EM02	UMCf	98.2 - 108.2	22.7	----	----	----	6,140,000	19,800	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-13D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	138.4	----	----	----	9,360,000 J	1,860	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-13D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	55.9	<4.07	<4.26	7,020	7,430,000	16,100	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-13D	1/12/2023	N	EM05	UMCf	98.2 - 108.2	76.1	----	----	----	5,460,000	15,100	<2.94	<2.98	<2.66	<3.16	<2.00	<3.76	<2.84	<4.60	<4.74	<9.62	<6.44	<5.52			
U4-MW-13I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	2478.1	<4.07	<4.26	<2.91	8,680,000	21,900	<0.147	<0.149	<0.133	<0.158	<0.100	0.403 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-13I	9/28/2022	N	EM01	UMCf	77.1 - 87.1	70.5	----	----	----	2,540,000 J+	17,000	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-13I	10/10/2022	N	EM02	UMCf	77.1 - 87.1	142.6	----	----	----	2,660,000	8,000	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-13I	11/3/2022	N	EM03	UMCf	77.1 - 87.1	119.3	----	----	----	3,340,000 J	5,840 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-13I	12/6/2022	N	EM04	UMCf	77.1 - 87.1	94.5	<4.07 UJ	<4.26 UJ	1,300	2,710,000	<0.150 UJ	<0.735 UJ	<0.745 UJ	<0.665 UJ	<0.790 UJ	<0.500 UJ	<0.940 UJ	<0.710 UJ	<1.15 UJ	<1.19 UJ	<2.41 UJ	<1.61 UJ	<1.38 UJ			
U4-MW-13I	1/12/2023	N	EM05	UMCf	77.1 - 87.1	118.8	----	----	----	1,960,000	4.48	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-14D	4/13/2022	N	BL02	UMCf	97.3 - 107.3	50.4	<4.07	<4.26	<2.91	2,550,000	239	<0.147	<0.149	<0.133	<0.158	<0.100	0.409 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-14D	12/6/2022	N	EM04	UMCf	97.3 - 107.3	58.1	<4.07 UJ	<4.26 UJ	<2.91 UJ	4,530,000	5,860	<0.735 UJ	<0.745 UJ	<0.665 UJ	<0.790 UJ	<0.500 UJ	<0.940 UJ	<0.710 UJ	<1.15 UJ	<1.19 UJ	<2.41 UJ	<1.61 UJ	<1.38 UJ			
U4-MW-14I	4/14/2022	N	BL02	UMCf	77.3 - 87.3	57.4	<4.07	<4.26	<2.91	3,220,000	2,270	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-14I	12/6/2022	N	EM04	UMCf	77.3 - 87.3	23.4	<4.07 UJ	<4.26 UJ	29.8	5,260,000	4,360 J-	<0.735 UJ	<0.745 UJ	<0.665 UJ	<0.790 UJ	<0.500 UJ	<0.940 UJ	<0.710 UJ	<1.15 UJ	<1.19 UJ	<2.41 UJ	<1.61 UJ	<1.38 UJ			
U4-MW-15D	4/13/2022	N	BL02	UMCf	96.0 - 106.0	76.6	<4.07	<4.26	<2.91	3,490,000	5,240	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-15D	12/5/2022	N	EM04	UMCf	96.0 - 106.0	435.5	<4.07	<4.26	<2.91	2,880,000	3,380 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-15DD	4/13/2022	N	BL02	UMCf	120.3 - 130.3	82.3	<4.07	<4.26	<2.91	677,000	67.5	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-15DD	12/5/2022	N	EM04	UMCf	120.3 - 130.3	51.1	<4.07	<4.26	<2.91	553,000	14.5	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-15I	4/12/2022	N	BL02	UMCf	76.8 - 86.8	20895.7 E	<4.07	<4.26	<2.91	4,080,000	5,010	<0.147	<0.149	<0.133	<0.158	<0.100	0.367 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-15I	12/5/2022	N	EM04	UMCf	76.8 - 86.8	137.7	<4.07	<4.26	3,490	3,130,000	4,730 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-15S	4/13/2022	N	BL02	UMCf	54.8 - 64.8	71.7	<4.07	<4.26	<2.91	1,450,000	262	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-15S	12/5/2022	N	EM04	UMCf	54.8 - 64.8	32.2	<4.07	<4.26	20,200	1,850,000	0.995	<3.68	<3.73	<3.33	<3.95	<2.50	<4.70	<3.55	<5.75	<5.93	<12.0	<8.05	<6.90			
U4-MW-16D	4/11/2022	N	BL02	UMCf	96.8 - 106.8	84.8 E	<4.07	<4.26	<2.91	30,500,000	61,300	<0.147	<0.149	<0.133	<0.158	<0.100	0.237 J	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-16D	12/5/2022	N	EM04	UMCf	96.8 - 106.8	84.8	<4.07	<4.26	374	13,400,000	21,900	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-16DD	4/12/2022	N	BL02	UMCf	120.8 - 130.8	35.4	<4.07	<4.26	<2.91	1,940,000	682	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-16DD	12/5/2022	N	EM04	UMCf	120.8 - 130.8	18.9	<4.07	<4.26	<2.91	1,220,000	215 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-16I	4/11/2022	N	BL02	UMCf	77.0 - 87.0	-449448.0 E	<4.07	<4.26	<2.91	5,220,000	9,350	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-16I	12/5/2022	N	EM04	UMCf	77.0 - 87.0	5.3	<4.07	<4.26	2,930	2,120,000	0.467 J	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-16I	12/5/2022	FD	EM04	UMCf	77.0 - 87.0	----	<4.07	<4.26	3,090	2,000,000	0.735	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-16S	4/12/2022	N	BL02	UMCf	54.8 - 64.8	-8.5	<4.07	8.07 J	19.8	1,990,000	365 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-16S	4/12/2022	FD	BL02	UMCf	54.8 - 64.8	----	<4.07	<4.26	<2.91	2,000,000	361 J-	<0.147	<0.149	<0.133	<0.158	<0.100	<0.188	<0.142	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-MW-16S	12/6/2022	N	EM04	UMCf	54.8 - 64.8	35.4	<4.07 UJ	<4.26 UJ	134	1,630,000	50.6	<0.147 UJ	<0.149 UJ	<0.133 UJ	<0.158 UJ	<0.100 UJ	<0.188 UJ	<0.142 UJ	<0.230 UJ	<0.237 UJ	<0.481 UJ	<0.322 UJ	<0.276 UJ			
U4-SLMW	11/10/2022	N	EM03		-	----	----	----	----	588,000	<0.150	<0.735	<0.745	<0.665	<0.790	<0.500	<0.940	<0.710	<1.15	<1.19	<2.41	<1.61	<1.38			
U4-T3	10/13/2022	N	EM02		-	----	----	----	----	16,100,000 J	38,400	<0.147	<0.149	<0.133	<0.158	<0.100	0.284 J	0.271 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-T3	11/3/2022	N	EM03		-	169.1	----	----	----	15,400,000	36,900	<0.147	<0.149	<0.133	<0.158	<0.100	0.293 J	0.376 J	<0.230	<0.237	<0.481	<0.322	<0.276			
U4-T3	12/6/2022	N	EM04		-	30.1	----	----	----	12,600,000	25,100 J-	<2.94 UJ	<2.98 UJ	<2.66 UJ	<3.16 UJ	<2.00 UJ	<3.76 UJ	<2.84 UJ	<4.60 UJ	<4.74 UJ	<9.62 UJ	<6.44 UJ	<5.52 UJ			
U4-T3	1/9/2023	N	EM05		-	0.0	----	----	----	12,200,000	37,400	<0.147	<0.149	<0.133	<0.158	<0.100	0.236 J	0.273 J	<0.230	<0.237	<0.481	<0.322	<0.276			

Notes:  
 FD - Field duplicate  
 E - Field instrument error.  
 J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.  
 J- - The result is an estimated quantity, but the result may be biased low.  
 J+ - The result is an estimated quantity, but the result may be biased high.  
 mg/L - milligrams per liter  
 µg/L - micrograms per liter  
 N - Normal field sample  
 R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.<

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																	
						1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene (Mesitylene)	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone (MEK)	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-Pentanone	Acetone	Benzene	Bromobenzene	Bromochloromethane
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
M-247-100	4/20/2022	N	BL02	UMCf	100.5 - 110.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
M-249-100	4/20/2022	N	BL02	UMCf	99.6 - 109.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
M-251-100	4/19/2022	N	BL02	UMCf	92.5 - 102.5	<0.126	<0.107	0.346 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
M-251-100	10/13/2022	N	EM02	UMCf	92.5 - 102.5	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
M-251-100	11/2/2022	N	EM03	UMCf	92.5 - 102.5	<1.26	<1.07	<0.819	<1.49	<1.04	<1.10	<1.10	<1.20	<1.61	<11.9	<1.06	<7.87	<1.14	<4.78	<113	<0.941	<1.18	<1.28
M-251-100	12/8/2022	N	EM04	UMCf	92.5 - 102.5	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
M-251-100	1/11/2023	N	EM05	UMCf	92.5 - 102.5	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
M-251-60	4/18/2022	N	BL02	UMCf	52.3 - 62.3	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	0.132 J	<0.118	<0.128
M-252	4/21/2022	N	BL02	UMCf	132.3 - 142.3	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	7.60 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
M-253-100	4/20/2022	N	BL02	UMCf	100.8 - 110.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
M-255-100	4/20/2022	N	BL02	UMCf	100.2 - 110.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
U4-E-01D	4/18/2022	N	BL02	UMCf	94.7 - 109.7	<0.630	<0.535	<0.409	<0.745	<0.520	<0.550	<0.550	<0.600	<0.805	<5.95	<0.530	<3.94	<0.570	<2.39	<56.5	<0.471	<0.590	<0.640
U4-E-01I	4/19/2022	N	BL02	UMCf	74.6 - 89.6	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	3.29 J	<0.106	<0.787	<0.114	<0.478	11.7 J	<0.0941	<0.118	<0.128
U4-E-01I	4/19/2022	FD	BL02	UMCf	74.6 - 89.6	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	3.45 J	<0.106	0.848 J	<0.114	<0.478	11.7 J	<0.0941	<0.118	<0.128
U4-E-02D	4/20/2022	N	BL02	UMCf	94.4 - 109.4	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-02I	4/18/2022	N	BL02	UMCf	74.4 - 89.4	<0.126	<0.107	<0.0819	<0.149	<0.104 R	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118 UJ	<0.128
U4-E-03D	4/19/2022	N	BL02	UMCf	95.1 - 110.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-03D	10/13/2022	N	EM02	UMCf	95.1 - 110.1	<25.2	<21.4	<16.4	<29.8	<20.8	<22.0	<22.0	<24.0	<32.2	<238	<21.2	<157	<22.8	<95.6	<2,260	<18.8	<23.6	<25.6
U4-E-03D	11/3/2022	N	EM03	UMCf	95.1 - 110.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-03D	12/6/2022	N	EM04	UMCf	95.1 - 110.1	<2.52 UJ	<2.14 UJ	<1.64 UJ	<2.98 UJ	<2.08 UJ	<2.20 UJ	<2.20 UJ	<2.40 UJ	<3.22 UJ	<23.8 UJ	<2.12 UJ	<15.7 UJ	<2.28 UJ	<9.56 UJ	<226 UJ	<1.88 UJ	<2.36 UJ	<2.56 UJ
U4-E-03D	1/9/2023	N	EM05	UMCf	95.1 - 110.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-04D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-04I	4/18/2022	N	BL02	UMCf	75.0 - 90.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-05D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	2.86 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-05I	4/19/2022	N	BL02	UMCf	75.0 - 90.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	4.61 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-06D	4/11/2022	N	BL02	UMCf	95.1 - 110.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	0.186 J	<0.118	<0.128
U4-E-06I	4/11/2022	N	BL02	UMCf	73.2 - 88.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	0.166 J	<0.118	<0.128
U4-E-06I	4/11/2022	FD	BL02	UMCf	73.2 - 88.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	0.153 J	<0.118	<0.128
U4-E-06I	10/12/2022	N	EM02	UMCf	73.2 - 88.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	8.89 J	<0.106	<0.787	<0.114	<0.478	33.8 J	<0.0941	<0.118	0.445 J
U4-E-06I	11/3/2022	N	EM03	UMCf	73.2 - 88.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	10.5	<0.106	<0.787	<0.114	<0.478	39.8 J	<0.0941	<0.118	<0.128
U4-E-06I	12/6/2022	N	EM04	UMCf	73.2 - 88.2	<1.26 UJ	<1.07 UJ	<0.819 UJ	<1.49 UJ	<1.04 UJ	<1.10 UJ	<1.10 UJ	<1.20 UJ	<1.61 UJ	36.1 J	<1.06 UJ	<7.87 UJ	<1.14 UJ	<4.78 UJ	<113 UJ	<0.941 UJ	<1.18 UJ	<1.28 UJ
U4-E-06I	1/9/2023	N	EM05	UMCf	73.2 - 88.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	16.0 J+	<0.106	<0.787	<0.114	<0.478	32.8 J	<0.0941	<0.118	<0.128
U4-E-07D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	<0.126	<0.107	0.205 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-07I	4/12/2022	N	BL02	UMCf	74.7 - 89.7	<0.126	<0.107	0.138 J	0.191 J	<0.104	<0.110	<0.110	<0.120	<0.161	1.25 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-07I	10/11/2022	N	EM02	UMCf	74.7 - 89.7	<1.26	<1.07	<0.819	<1.49	<1.04	<1.10	<1.10	<1.20	<1.61	<11.9	<1.06	<7.87	<1.14	<4.78	<113	<0.941	<1.18	<1.28
U4-E-07I	11/3/2022	N	EM03	UMCf	74.7 - 89.7	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	2.17 J	<0.106	<0.787	<0.114	<0.478	<11.3	0.186 J	<0.118	<0.128
U4-E-07I	12/6/2022	N	EM04	UMCf	74.7 - 89.7	<3.15 UJ	<2.68 UJ	<2.05 UJ	<3.73 UJ	<2.60 UJ	<2.75 UJ	<2.75 UJ	<3.00 UJ	<4.03 UJ	<29.8 UJ	<2.65 UJ	<19.7 UJ	<2.85 UJ	<12.0 UJ	<282 UJ	<2.35 UJ	<2.95 UJ	<3.20 UJ
U4-E-07I	1/9/2023	N	EM05	UMCf	74.7 - 89.7	<0.126	<0.107	0.137 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-08D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	<0.126	<0.107	0.240 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	0.298 J
U4-E-08D	10/11/2022	N	EM02	UMCf	94.6 - 109.6	<1.26	<1.07	<0.819	<1.49	<1.04	<1.10	<1.10	<1.20	<1.61	<11.9	<1.06	<7.87	<1.14	<4.78	<113	<0.941	<1.18	<1.28
U4-E-08D	11/3/2022	N	EM03	UMCf	94.6 - 109.6	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	1.32 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-08D	12/6/2022	N	EM04	UMCf	94.6 - 109.6	<3.15 UJ	<2.68 UJ	<2.05 UJ	<3.73 UJ	<2.60 UJ	<2.75 UJ	<2.75 UJ	<3.00 UJ	<4.03 UJ	<29.8 UJ	<2.65 UJ	<19.7 UJ	<2.85 UJ	<12.0 UJ	<282 UJ	<2.35 UJ	<2.95 UJ	<3.20 UJ
U4-E-08D	1/9/2023	N	EM05	UMCf	94.6 - 109.6	<0.126	<0.107	0.131 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	2.81 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-E-09D	4/15/2022	N	BL02	UMCf	94.5 - 109.5	<0.126	&																



Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																	
						1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene (Mesitylene)	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone (MEK)	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-Pentanone	Acetone	Benzene	Bromobenzene	Bromochloromethane
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-05D	10/13/2022	N	EM02	UMCF	98.2 - 108.2	<12.6	<10.7	<8.19	<14.9	<10.4	<11.0	<11.0	<12.0	<16.1	<11.9	<10.6	<78.7	<11.4	<47.8	<1,130	<9.41	<11.8	<12.8
U4-MW-05D	11/3/2022	N	EM03	UMCF	98.2 - 108.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-05D	12/7/2022	N	EM04	UMCF	98.2 - 108.2	<0.126	<0.107	0.186 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-05D	1/11/2023	N	EM05	UMCF	98.2 - 108.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	16.9 J	<0.0941	<0.118	<0.128
U4-MW-05I	4/15/2022	N	BL02	UMCF	76.6 - 86.6	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-05I	10/13/2022	N	EM02	UMCF	76.6 - 86.6	<12.6	<10.7	<8.19	<14.9	<10.4	<11.0	<11.0	<12.0	<16.1	<11.9	<10.6	<78.7	<11.4	<47.8	<1,130	<9.41	<11.8	<12.8
U4-MW-05I	11/3/2022	N	EM03	UMCF	76.6 - 86.6	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-05I	12/8/2022	N	EM04	UMCF	76.6 - 86.6	<0.126	<0.107	0.531 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-05I	1/11/2023	N	EM05	UMCF	76.6 - 86.6	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-06D	4/19/2022	N	BL02	UMCF	97.1 - 107.1	<0.126	<0.107	0.785 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	4.05 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-06I	4/19/2022	N	BL02	UMCF	76.5 - 86.5	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	0.128 J	<0.118	<0.128
U4-MW-07D	4/15/2022	N	BL02	UMCF	96.8 - 106.5	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-07D	10/12/2022	N	EM02	UMCF	96.8 - 106.5	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	1.20 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-07D	10/12/2022	FD	EM02	UMCF	96.8 - 106.5	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-07D	11/3/2022	N	EM03	UMCF	96.8 - 106.5	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-07D	12/7/2022	N	EM04	UMCF	96.8 - 106.5	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-07D	1/11/2023	N	EM05	UMCF	96.8 - 106.5	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-07I	4/15/2022	N	BL02	UMCF	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-07I	10/12/2022	N	EM02	UMCF	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-07I	11/3/2022	N	EM03	UMCF	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-07I	12/7/2022	N	EM04	UMCF	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-07I	1/11/2023	N	EM05	UMCF	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-08D	4/13/2022	N	BL02	UMCF	98.6 - 108.6	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-08D	12/7/2022	N	EM04	UMCF	98.6 - 108.6	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	11.7 J+	<0.106	<0.787	<0.114	<0.478	39.5 J	<0.0941	<0.118	<0.128
U4-MW-08DD	4/20/2022	N	BL02	UMCF	119.8 - 129.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	18.7 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-08DD	4/20/2022	FD	BL02	UMCF	119.8 - 129.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	5.79 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-08DD	12/8/2022	N	EM04	UMCF	119.8 - 129.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	0.870 J	<0.118	<0.128
U4-MW-08I	4/13/2022	N	BL02	UMCF	78.0 - 88.0	<0.126	<0.107	0.345 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-08I	12/7/2022	N	EM04	UMCF	78.0 - 88.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-08I	12/7/2022	FD	EM04	UMCF	78.0 - 88.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-08S	4/15/2022	N	BL02	UMCF	54.9 - 64.9	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	1.31 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-08S	12/7/2022	N	EM04	UMCF	54.9 - 64.9	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-08S	12/7/2022	FD	EM04	UMCF	54.9 - 64.9	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-09D	4/14/2022	N	BL02	UMCF	96.9 - 106.9	<0.126	<0.107	0.239 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-09D	12/6/2022	N	EM04	UMCF	96.9 - 106.9	<1.26 UJ	<1.07 UJ	<0.819 UJ	<1.49 UJ	<1.04 UJ	<1.10 UJ	<1.10 UJ	<1.20 UJ	<1.61 UJ	<11.9 UJ	<1.06 UJ	<7.87 UJ	<1.14 UJ	<4.78 UJ	<113 UJ	<0.941 UJ	<1.18 UJ	<1.28 UJ
U4-MW-09DD	4/14/2022	N	BL02	UMCF	119.8 - 129.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-09DD	12/6/2022	N	EM04	UMCF	119.8 - 129.8	<0.126 UJ	<0.107 UJ	<0.0819 UJ	<0.149 UJ	<0.104 UJ	<0.110 UJ	<0.110 UJ	<0.120 UJ	<0.161 UJ	<1.19 UJ	<0.106 UJ	<0.787 UJ	<0.114 UJ	<0.478 UJ	<11.3 UJ	<0.0941 UJ	<0.118 UJ	<0.128 UJ
U4-MW-09I	4/14/2022	N	BL02	UMCF	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	2.49	<0.118	<0.128
U4-MW-09I	12/6/2022	N	EM04	UMCF	76.8 - 86.8	<1.26 UJ	<1.07 UJ	<0.819 UJ	<1.49 UJ	<1.04 UJ	<1.10 UJ	<1.10 UJ	<1.20 UJ	<1.61 UJ	<11.9 UJ	<1.06 UJ	<7.87 UJ	<1.14 UJ	<4.78 UJ	<113 UJ	<0.941 UJ	<1.18 UJ	<1.28 UJ
U4-MW-09S	4/14/2022	N	BL02	UMCF	55.3 - 65.3	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-09S	12/6/2022	N	EM04	UMCF	55.3 - 65.3	<0.126 UJ	<0.107 UJ	<0.0819 UJ	<0.149 UJ	<0.104 UJ	<0.110 UJ	<0.110 UJ	<0.120 UJ	<0.161 UJ	<1.19 UJ	<0.106 UJ	<0.787 UJ	<0.114 UJ	<0.478 UJ	<11.3 UJ	<0.0941 UJ	<0.118 UJ	<0.128 UJ
U4-MW-10D	4/14/2022	N	BL0																				

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																	
						1,2-Dibromoethane	1,2-Dichlorobenzene	1,2-Dichloroethane	1,2-Dichloropropane	1,3,5-Trimethylbenzene (Mesitylene)	1,3-Dichlorobenzene	1,3-Dichloropropane	1,4-Dichlorobenzene	2,2-Dichloropropane	2-Butanone (MEK)	2-Chlorotoluene	2-Hexanone	4-Chlorotoluene	4-Methyl-2-Pentanone	Acetone	Benzene	Bromobenzene	Bromochloromethane
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-12I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	10.6 J+	<0.106	<0.787	<0.114	<0.478	16.9 J	<0.0941	<0.118	<0.128
U4-MW-12I	12/7/2022	FD	EM04	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	10.3 J+	<0.106	<0.787	<0.114	<0.478	16.1 J	<0.0941	<0.118	<0.128
U4-MW-12I	1/13/2023	N	EM05	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	9.72 J	<0.106	<0.787	<0.114	<0.478	30.3 J	<0.0941	<0.118	<0.128
U4-MW-13D	4/14/2022	N	BL02	UMCf	98.2 - 108.2	<0.126	<0.107	0.200 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13D	9/28/2022	N	EM01	UMCf	98.2 - 108.2	<1.26	<1.07	<0.819	<1.49	<1.04	<1.10	<1.10	<1.20	<1.61	<11.9	<1.06	<7.87	<1.14	<4.78	<11.3	<0.941	<1.18	<1.28
U4-MW-13D	10/11/2022	N	EM02	UMCf	98.2 - 108.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	14.7	<0.106	<0.787	<0.114	<0.478	66.9	<0.0941	<0.118	<0.128
U4-MW-13D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	2.69 J	<0.106	<0.787	<0.114	<0.478	15.0 J	<0.0941	<0.118	<0.128
U4-MW-13D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13D	1/12/2023	N	EM05	UMCf	98.2 - 108.2	<2.52	<2.14	<1.64	<2.98	<2.08	<2.20	<2.20	<2.40	<3.22	<23.8	<2.12	<15.7	<2.28	<9.56	<226	<1.88	<2.36	<2.56
U4-MW-13I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	<0.126	<0.107	0.133 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13I	9/28/2022	N	EM01	UMCf	77.1 - 87.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	0.157 J	<0.118	<0.128
U4-MW-13I	10/10/2022	N	EM02	UMCf	77.1 - 87.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	1.81 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13I	11/3/2022	N	EM03	UMCf	77.1 - 87.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-13I	12/6/2022	N	EM04	UMCf	77.1 - 87.1	<0.630 UJ	<0.535 UJ	<0.409 UJ	<0.745 UJ	<0.520 UJ	<0.550 UJ	<0.550 UJ	<0.600 UJ	<0.805 UJ	19.1 J	<0.530 UJ	<3.94 UJ	<0.570 UJ	<2.39 UJ	<56.5 UJ	<0.471 UJ	<0.590 UJ	<0.640 UJ
U4-MW-13I	1/12/2023	N	EM05	UMCf	77.1 - 87.1	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	20.5 J+	<0.106	<0.787	<0.114	<0.478	16.9 J	<0.0941	<0.118	<0.128
U4-MW-14D	4/13/2022	N	BL02	UMCf	97.3 - 107.3	<0.126	<0.107	0.134 J	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-14D	12/6/2022	N	EM04	UMCf	97.3 - 107.3	<0.630 UJ	<0.535 UJ	<0.409 UJ	<0.745 UJ	<0.520 UJ	<0.550 UJ	<0.550 UJ	<0.600 UJ	<0.805 UJ	<5.95 UJ	<0.530 UJ	<3.94 UJ	<0.570 UJ	<2.39 UJ	<56.5 UJ	<0.471 UJ	<0.590 UJ	<0.640 UJ
U4-MW-14I	4/14/2022	N	BL02	UMCf	77.3 - 87.3	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-14I	12/6/2022	N	EM04	UMCf	77.3 - 87.3	<0.630 UJ	<0.535 UJ	<0.409 UJ	<0.745 UJ	<0.520 UJ	<0.550 UJ	<0.550 UJ	<0.600 UJ	<0.805 UJ	<5.95 UJ	<0.530 UJ	<3.94 UJ	<0.570 UJ	<2.39 UJ	<56.5 UJ	<0.471 UJ	<0.590 UJ	<0.640 UJ
U4-MW-15D	4/13/2022	N	BL02	UMCf	96.0 - 106.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-15D	12/5/2022	N	EM04	UMCf	96.0 - 106.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-15DD	4/13/2022	N	BL02	UMCf	120.3 - 130.3	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-15DD	12/5/2022	N	EM04	UMCf	120.3 - 130.3	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	14.4 J	<0.0941	<0.118	<0.128
U4-MW-15I	4/12/2022	N	BL02	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-15I	12/5/2022	N	EM04	UMCf	76.8 - 86.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	20.3 J+	<0.106	<0.787	<0.114	<0.478	37.2 J	<0.0941	<0.118	<0.128
U4-MW-15S	4/13/2022	N	BL02	UMCf	54.8 - 64.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-15S	12/5/2022	N	EM04	UMCf	54.8 - 64.8	<3.15	<2.68	<2.05	<3.73	<2.60	<2.75	<2.75	<3.00	<4.03	<29.8	<2.65	<19.7	<2.85	<12.0	<282	<2.35	<2.95	<3.20
U4-MW-16D	4/11/2022	N	BL02	UMCf	96.8 - 106.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	0.261 J	<0.118	<0.128
U4-MW-16D	12/5/2022	N	EM04	UMCf	96.8 - 106.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-16DD	4/12/2022	N	BL02	UMCf	120.8 - 130.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-16DD	12/5/2022	N	EM04	UMCf	120.8 - 130.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-16I	4/11/2022	N	BL02	UMCf	77.0 - 87.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	0.186 J	<0.118	<0.128
U4-MW-16I	12/5/2022	N	EM04	UMCf	77.0 - 87.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	36.1 J+	<0.106	<0.787	<0.114	<0.478	20.0 J	<0.0941	<0.118	<0.128
U4-MW-16I	12/5/2022	FD	EM04	UMCf	77.0 - 87.0	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	34.3 J+	<0.106	<0.787	<0.114	<0.478	18.7 J	<0.0941	<0.118	<0.128
U4-MW-16S	4/12/2022	N	BL02	UMCf	54.8 - 64.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	1.22 J	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-16S	4/12/2022	FD	BL02	UMCf	54.8 - 64.8	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	<11.3	<0.0941	<0.118	<0.128
U4-MW-16S	12/6/2022	N	EM04	UMCf	54.8 - 64.8	<0.126 UJ	<0.107 UJ	<0.0819 UJ	<0.149 UJ	<0.104 UJ	<0.110 UJ	<0.110 UJ	<0.120 UJ	<0.161 UJ	<1.19 UJ	<0.106 UJ	<0.787 UJ	<0.114 UJ	<0.478 UJ	<11.3 UJ	<0.0941 UJ	<0.118 UJ	<0.128 UJ
U4-SLMW	11/10/2022	N	EM03		-	<0.630	<0.535	<0.409	<0.745	<0.520	<0.550	<0.550	<0.600	<0.805	<5.95	<0.530	<3.94	<0.570	<2.39	<56.5	<0.471	<0.590	<0.640
U4-T3	10/13/2022	N	EM02		-	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	<1.19	<0.106	<0.787	<0.114	<0.478	22.8 J	<0.0941	<0.118	<0.128
U4-T3	11/3/2022	N	EM03		-	<0.126	<0.107	<0.0819	<0.149	<0.104	<0.110	<0.110	<0.120	<0.161	3.43 J	<0.106	<0.787	<0.114	<0.478	12.3 J	<0.0941	<0.118	<0.128
U4-T3	12/6/2022	N	EM04		-	<2.52 UJ	<2.14 UJ	<1.64 UJ	<2.98 UJ	<2.08 UJ	<2.20 UJ	<2.20 UJ	<2.40 UJ	<3.22 UJ	<23.8 UJ	<2.12 UJ	<15.7 UJ	<2.28 UJ	<9.56 UJ	<226 UJ	<1.88 UJ	<2.36 UJ	<2.56 UJ
U4-T3	1/9/2023																						

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B															
						Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Diisopropyl Ether (DIPE)	Ethyl Tert-Butyl Ether (ETBE)	Ethylbenzene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
M-247-100	4/20/2022	N	BL02	UMCf	100.5 - 110.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
M-249-100	4/20/2022	N	BL02	UMCf	99.6 - 109.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
M-251-100	4/19/2022	N	BL02	UMCf	92.5 - 102.5	13.1	8.80	<0.605	<0.128	<0.116	<0.192	8.010	<0.960	<0.126	<0.111	6.51	<0.122	<0.374	<0.105	<0.101	<0.137
M-251-100	10/13/2022	N	EM02	UMCf	92.5 - 102.5	6.92	3.40	<0.605	<0.128	<0.116	<0.192	3.950	<0.960	<0.126	<0.111	3.91	<0.122	<0.374	<0.105	<0.101	<0.137
M-251-100	11/2/2022	N	EM03	UMCf	92.5 - 102.5	5.61 J	<1.29	<6.05	<1.28	<1.16	<1.92	2,420	<9.60	<1.26	<1.11	2.27 J	<1.22	<3.74	<1.05	<1.01	<1.37
M-251-100	12/8/2022	N	EM04	UMCf	92.5 - 102.5	4.81	1.77	<0.605	1.55	<0.116	<0.192	2,240	<0.960	<0.126	<0.111	2.75	<0.122	<0.374	<0.105	<0.101	<0.137
M-251-100	1/11/2023	N	EM05	UMCf	92.5 - 102.5	4.88	1.80	<0.605	<0.128	<0.116	<0.192	2,680	<0.960	<0.126	<0.111	2.88	<0.122	<0.374	<0.105	<0.101	<0.137
M-251-60	4/18/2022	N	BL02	UMCf	52.3 - 62.3	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	13.5	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
M-252	4/21/2022	N	BL02	UMCf	132.3 - 142.3	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	0.192 J	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
M-253-100	4/20/2022	N	BL02	UMCf	100.8 - 110.8	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
M-255-100	4/20/2022	N	BL02	UMCf	100.2 - 110.2	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
U4-E-01D	4/18/2022	N	BL02	UMCf	94.7 - 109.7	5.46	9.81 J-	<3.03	<0.640	<0.580	<0.960	6,650	<4.80	<0.630	<0.555	4.26 J	<0.610	<1.87	<0.525	<0.505	<0.685
U4-E-01I	4/19/2022	N	BL02	UMCf	74.6 - 89.6	0.521 J	0.388 J	<0.605	<0.128	<0.116	<0.192	186 J	<0.960	<0.126	<0.111	0.328 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-01I	4/19/2022	FD	BL02	UMCf	74.6 - 89.6	0.509 J	<0.129	<0.605	<0.128	<0.116	<0.192	280 J	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-02D	4/20/2022	N	BL02	UMCf	94.4 - 109.4	3.33 J+	1.82	<0.605	<0.128	<0.116	<0.192	1,660	<0.960	<0.126	<0.111	1.39	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-02I	4/18/2022	N	BL02	UMCf	74.4 - 89.4	1.65	1.65	<0.605	<0.128	<0.116	<0.192	727	<0.960	<0.126	<0.111	0.956 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-03D	4/19/2022	N	BL02	UMCf	95.1 - 110.1	10.9	6.45	<0.605	<0.128	<0.116	<0.192	6,390	<0.960	<0.126	<0.111	4.96	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-03D	10/13/2022	N	EM02	UMCf	95.1 - 110.1	<27.2	<25.8	<121	<25.6	<23.2	<38.4	4,280	<192	<25.2	<22.2	<28.0	<24.4	<74.8	<21.0	<20.2	<27.4
U4-E-03D	11/3/2022	N	EM03	UMCf	95.1 - 110.1	9.37	4.31	<0.605	2.75	<0.116	<0.192	4,350	<0.960	<0.126	<0.111	5.14 J+	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-03D	12/6/2022	N	EM04	UMCf	95.1 - 110.1	7.65 J	3.37 J	<12.1 UJ	6.86 J	<2.32 UJ	<3.84 UJ	3,470	<19.2 UJ	<2.52 UJ	<2.22 UJ	<2.10 UJ	<2.44 UJ	<7.48 UJ	<2.10 UJ	<2.02 UJ	<2.74 UJ
U4-E-03D	1/9/2023	N	EM05	UMCf	95.1 - 110.1	7.40	2.90	<0.605	2.25	<0.116	<0.192	3,520	<0.960	<0.126	<0.111	3.66	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-04D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	2.28	0.947 J	<0.605	<0.128	<0.116	<0.192	2,980	<0.960	<0.126	<0.111	0.812 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-04I	4/18/2022	N	BL02	UMCf	75.0 - 90.0	0.591 J	<0.129	<0.605	<0.128	<0.116	<0.192	433	<0.960	<0.126	<0.111	0.141 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-05D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	4.11	3.20	<0.605	<0.128	<0.116	<0.192	3,780	<0.960	<0.126	<0.111	2.06	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-05I	4/19/2022	N	BL02	UMCf	75.0 - 90.0	1.41	1.99	<0.605	<0.128	<0.116	<0.192	516	<0.960	<0.126	<0.111	0.948 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-06D	4/11/2022	N	BL02	UMCf	95.1 - 110.1	0.502 J	0.185 J	<0.605	<0.128	<0.116	<0.192	819	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-06I	4/11/2022	N	BL02	UMCf	73.2 - 88.2	0.679 J	<0.129	<0.605	<0.128	<0.116	<0.192	218	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-06I	4/11/2022	FD	BL02	UMCf	73.2 - 88.2	0.605 J	<0.129	<0.605	<0.128	<0.116	<0.192	215	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-06I	10/12/2022	N	EM02	UMCf	73.2 - 88.2	1.58	0.258 J	<0.605	1.14	<0.116	<0.192	<0.111	<0.960	<0.126	<0.111	0.447 J	<0.122	<0.374	<0.105	4.56	<0.137
U4-E-06I	11/3/2022	N	EM03	UMCf	73.2 - 88.2	1.16 J+	0.235 J	<0.605	0.654 J	<0.116	<0.192	1,740	<0.960	<0.126	<0.111	0.414 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-06I	12/6/2022	N	EM04	UMCf	73.2 - 88.2	<1.36 UJ	<1.29 UJ	<6.05 UJ	2.80 J	<1.16 UJ	<1.92 UJ	1,080	<9.60 UJ	<1.26 UJ	<1.11 UJ	<1.40 UJ	<1.22 UJ	<3.74 UJ	<1.05 UJ	<1.01 UJ	<1.37 UJ
U4-E-06I	1/9/2023	N	EM05	UMCf	73.2 - 88.2	1.18	0.386 J	<0.605	0.877 J	<0.116	<0.192	2,050	<0.960	<0.126	<0.111	0.412 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-07D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	3.05	1.20	<0.605	2.62	<0.116	<0.192	5,980	<0.960	<0.126	<0.111	1.08	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-07I	4/12/2022	N	BL02	UMCf	74.7 - 89.7	1.21	0.866 J	<0.605	1.03	<0.116	<0.192	1,140	<0.960	<0.126	<0.111	0.715 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-07I	10/11/2022	N	EM02	UMCf	74.7 - 89.7	2.84 J	<1.29	<6.05	5.80 J	<1.16	<1.92	<6.05	<9.60	<1.26	<1.11	<1.40	<1.22	<3.74	<1.05	<1.01	<1.37
U4-E-07I	11/3/2022	N	EM03	UMCf	74.7 - 89.7	4.41	1.98 J+	<0.605	1.58	<0.116	<0.192	3,510	<0.960	<0.126	<0.111	2.14 J+	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-07I	12/6/2022	N	EM04	UMCf	74.7 - 89.7	4.68 J	<3.22 UJ	<15.1 UJ	8.58 J	<2.90 UJ	<4.80 UJ	4,200	<24.0 UJ	<3.15 UJ	<2.78 UJ	<3.50 UJ	<3.05 UJ	<9.35 UJ	<2.63 UJ	<2.53 UJ	<3.43 UJ
U4-E-07I	1/9/2023	N	EM05	UMCf	74.7 - 89.7	4.48	1.88	<0.605	1.92	<0.116	<0.192	3,840	<0.960	<0.126	<0.111	2.24	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-08D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	2.74	0.954 J	<0.605	2.96	<0.116	<0.192	7,120	<0.960	<0.126	<0.111	1.00 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-08D	10/11/2022	N	EM02	UMCf	94.6 - 109.6	<1.36	<1.29	<6.05	5.96 J	<1.16	<1.92	4,850	<9.60	<1.26	<1.11	<1.40	<1.22	<3.74	<1.05	<1.01	<1.37
U4-E-08D	11/3/2022	N	EM03	UMCf	94.6 - 109.6	2.56 J+	0.740 J	<0.605	2.84	<0.116	<0.192	5,020	<0.960	<0.126	<0.111	0.768 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-08D	12/6/2022	N	EM04	UMCf	94.6 - 109.6	<3.40 UJ	<3.22 UJ	<15.1 UJ	8.37 J	<2.90 UJ	<4.80 UJ	4,090	<24.0 UJ	<3.15 UJ	<2.78 UJ	<3.50 UJ	<3.05 UJ	<9.35 UJ	<2.63 UJ	<2.53 UJ	<3.43 UJ
U4-E-08D	1/9/2023	N	EM05	UMCf	94.6 - 109.6	1.99	0.639 J	<0.605	1.73	<0.116	<0.192	4,300	<0.960	<0.126	<0.111	0.743 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-09D	4/15/2022	N	BL02	UMCf	94.5 - 109.5	0.642 J	0.461 J	<0.605	0.533 J	<0.116	<0.192	1,450	<0.960	<0.126	<0.111	0.209 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-09I	4/14/2022	N	BL02	UMCf	74.9 - 89.9	1.00 J	0.618 J	<0.605	0.610 J	<0.116	<0.192	1,240	<0.960	<0.126	<0.111	0.576 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-10D	4/13/2022	N	BL02	UMCf	94.5 - 109.5	1.14	0.707 J	<0.605	0.717 J	<0.116	<0.192	704 J+	<0.960	<0.126	<0.111	0.612 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-E-10I	4/13/2022	N	BL02	UMCf	74.2 - 89.2	0.478 J	0.509 J	<0.605	0.585 J	<0.116	<0.192	1,330	<0.960	<0.126	<0.111	0.441 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-01D	4/19/2022	N	BL02	UMCf	96.7 - 106.7	0.564 J	0.346 J	<0.605	<0.128	<0.116	<0.192	608	<0.960	<0.126	<0.111	0.274 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-01DD	4/19/2022	N	BL02	UMCf	119.9 - 129.9	0.170 J	<0.129	<0.605	<0.128	<0.1											

Table 5  
 Groundwater Analytical Results  
 Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B															
						Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethane	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Diisopropyl Ether (DIPE)	Ethyl Tert-Butyl Ether (ETBE)	Ethylbenzene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-05D	10/13/2022	N	EM02	UMCf	98.2 - 108.2	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	5,350	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7
U4-MW-05D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	11.3	5.15	<0.605	1.89	<0.116	<0.192	3,790	<0.960	<0.126	<0.111	6.10	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-05D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	12.9	6.25	<0.605	<0.128	<0.116	<0.192	3,950	<0.960	<0.126	<0.111	6.85	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-05D	1/11/2023	N	EM05	UMCf	98.2 - 108.2	11.2	5.71	<0.605	<0.128	<0.116	<0.192	3,990	<0.960	<0.126	<0.111	5.60	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-05I	4/15/2022	N	BL02	UMCf	76.6 - 86.6	9.46	5.71 J	<0.605	2.53	<0.116	<0.192	3,530	<0.960	<0.126	<0.111	4.75	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-05I	10/13/2022	N	EM02	UMCf	76.6 - 86.6	<13.6	<12.9	<60.5	<12.8	<11.6	<19.2	5,930	<96.0	<12.6	<11.1	<14.0	<12.2	<37.4	<10.5	<10.1	<13.7
U4-MW-05I	11/3/2022	N	EM03	UMCf	76.6 - 86.6	15.2	8.95	<0.605	3.70	<0.116	<0.192	5,800	<0.960	<0.126	<0.111	7.90	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-05I	12/8/2022	N	EM04	UMCf	76.6 - 86.6	14.5	8.16	<0.605	3.07	<0.116	<0.192	3,970	<0.960	<0.126	<0.111	6.57	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-05I	1/11/2023	N	EM05	UMCf	76.6 - 86.6	12.4	6.41	<0.605	2.70	<0.116	<0.192	4,040	<96.0	<0.126	<0.111	6.99	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-06D	4/19/2022	N	BL02	UMCf	97.1 - 107.1	10.0	5.10	<0.605	<0.128	<0.116	<0.192	4,840	<0.960	<0.126	<0.111	3.82	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-06D	4/19/2022	N	BL02	UMCf	76.5 - 86.5	0.674 J	0.297 J	<0.605	<0.128	<0.116	<0.192	217	<0.960	<0.126	<0.111	0.273 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-07D	4/15/2022	N	BL02	UMCf	96.8 - 106.5	1.13	0.515 J	<0.605	0.461 J	0.137 J	<0.192	1,330	<0.960	<0.126	<0.111	0.410 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-07D	10/12/2022	N	EM02	UMCf	96.8 - 106.5	3.77	0.211 J	<0.605	0.373 J	<0.116	<0.192	113	<0.960	<0.126	<0.111	2.38	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-07D	10/12/2022	FD	EM02	UMCf	96.8 - 106.5	2.98	0.201 J	<0.605	<0.128	<0.116	<0.192	95.5	<0.960	<0.126	<0.111	1.83	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-07D	11/3/2022	N	EM03	UMCf	96.8 - 106.5	3.76	0.280 J	<0.605	<0.128	<0.116	<0.192	146	<0.960	<0.126	<0.111	2.53 J+	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-07D	12/7/2022	N	EM04	UMCf	96.8 - 106.5	3.77	0.338 J	<0.605	<0.128	<0.116	<0.192	101	<0.960	<0.126	<0.111	2.25	0.240 J	<0.374	<0.105	<0.101	<0.137
U4-MW-07D	1/11/2023	N	EM05	UMCf	96.8 - 106.5	2.84	<0.129	<0.605	<0.128	<0.116	<0.192	119	<0.960	<0.126	<0.111	1.21	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-07I	4/15/2022	N	BL02	UMCf	76.8 - 86.8	0.676 J	0.206 J	<0.605	0.313 J	<0.116	<0.192	373	<0.960	<0.126	<0.111	0.189 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-07I	10/12/2022	N	EM02	UMCf	76.8 - 86.8	5.11	0.403 J	<0.605	0.425 J	<0.116	<0.192	164	<0.960	<0.126	<0.111	3.22	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-07I	11/3/2022	N	EM03	UMCf	76.8 - 86.8	3.61	0.321 J	<0.605	<0.128	<0.116	<0.192	153	<0.960	<0.126	<0.111	2.52 J+	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-07I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	4.08	0.353 J	<0.605	<0.128	<0.116	<0.192	129	<0.960	<0.126	<0.111	2.47	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-07I	1/11/2023	N	EM05	UMCf	76.8 - 86.8	2.79	0.162 J	<0.605	<0.128	<0.116	<0.192	154	<4.80	<0.126	<0.111	1.11	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08D	4/13/2022	N	BL02	UMCf	98.6 - 108.6	<0.136	0.452 J	<0.605	<0.128	<0.116	<0.192	10,300 J+	<0.960	<0.126	<0.111	0.370 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08D	12/7/2022	N	EM04	UMCf	98.6 - 108.6	3.42	0.921 J	<0.605	1.85	<0.116	<0.192	4,240	<0.960	<0.126	<0.111	1.82	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08DD	4/20/2022	N	BL02	UMCf	119.8 - 129.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	90.2	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08DD	4/20/2022	FD	BL02	UMCf	119.8 - 129.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	85.4	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08DD	12/8/2022	N	EM04	UMCf	119.8 - 129.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	28.1	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08I	4/13/2022	N	BL02	UMCf	78.0 - 88.0	5.72	2.19	<0.605	2.14	<0.116	<0.192	1,100 J+	<0.960	<0.126	<0.111	1.76	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08I	12/7/2022	N	EM04	UMCf	78.0 - 88.0	2.33	1.08	<0.605	1.46	<0.116	<0.192	2,660	<0.960	<0.126	<0.111	1.02	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08I	12/7/2022	FD	EM04	UMCf	78.0 - 88.0	2.52	1.14	<0.605	1.40	<0.116	<0.192	2,560	<0.960	<0.126	<0.111	1.05	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08S	4/15/2022	N	BL02	UMCf	54.9 - 64.9	0.213 J	<0.129 UJ	<0.605	<0.128	<0.116	<0.192	38.2	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08S	12/7/2022	N	EM04	UMCf	54.9 - 64.9	0.290 J	<0.129	<0.605	<0.128	<0.116	<0.192	15.0	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-08S	12/7/2022	FD	EM04	UMCf	54.9 - 64.9	0.275 J	<0.129	<0.605	<0.128	<0.116	<0.192	15.4	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-09D	4/14/2022	N	BL02	UMCf	96.9 - 106.9	1.86	0.936 J	<0.605	0.488 J	<0.116	<0.192	2,940	<0.960	<0.126	<0.111	0.814 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-09D	12/6/2022	N	EM04	UMCf	96.9 - 106.9	3.78 J	<1.29 UJ	<0.605 UJ	2.57 J	<1.16 UJ	<1.92 UJ	602	<9.60 UJ	<1.26 UJ	<1.11 UJ	2.99 J	<1.22 UJ	<3.74 UJ	<1.05 UJ	<1.01 UJ	<1.37 UJ
U4-MW-09DD	4/14/2022	N	BL02	UMCf	119.8 - 129.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	21.9	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-09DD	12/6/2022	N	EM04	UMCf	119.8 - 129.8	<0.136 UJ	<0.129 UJ	<0.605 UJ	<0.128 UJ	<0.116 UJ	<0.192 UJ	12.5	<0.960 UJ	<0.126 UJ	<0.111 UJ	<0.140 UJ	<0.122 UJ	<0.374 UJ	<0.105 UJ	<0.101 UJ	<0.137 UJ
U4-MW-09I	4/14/2022	N	BL02	UMCf	76.8 - 86.8	0.516 J	<0.129	<0.605	0.384 J	<0.116	<0.192	130	<0.960	<0.126	<0.111	0.509 J	<0.122	<0.374	<0.105	<0.101	0.232 J
U4-MW-09I	12/6/2022	N	EM04	UMCf	76.8 - 86.8	4.46 J	<1.29 UJ	<0.605 UJ	2.97 J	<1.16 UJ	<1.92 UJ	1,150	<9.60 UJ	<1.26 UJ	<1.11 UJ	2.89 J	<1.22 UJ	<3.74 UJ	<1.05 UJ	<1.01 UJ	<1.37 UJ
U4-MW-09S	4/14/2022	N	BL02	UMCf	55.3 - 65.3	0.248 J	<0.129	<0.605	<0.128	<0.116	<0.192	20.3	<0.960	<0.126	<0.111	0.374 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-09S	12/6/2022	N	EM04	UMCf	55.3 - 65.3	0.450 J	<0.129 UJ	<0.605 UJ	0.464 J	<0.116 UJ	<0.192 UJ	135	<0.960 UJ	<0.126 UJ	<0.111 UJ	0.224 J	<0.122 UJ	<0.374 UJ	<0.105 UJ	<0.101 UJ	<0.137 UJ
U4-MW-10D	4/14/2022	N	BL02	UMCf	96.9 - 106.9	0.213 J	0.477 J	<0.605	<0.128	<0.116	<0.192	316	<0.960	<0.126	<0.111	0.400 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-10D	12/5/2022	N	EM04	UMCf	96.9 - 106.9	0.138 J	<0.129	<0.605	<0.128	<0.116	<0.192	153	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-10I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	0.790 J	0.558 J	<0.605	0.491 J	<0.116	<0.192	695	<0.960	<0.126	<0.111	0.460 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-10I	12/5/2022	N	EM04	UMCf	77.1 - 87.1	0.387 J	<0.129	<0.605	<0.128	<0.116	<0.192	33.1	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-11D	4/15/2022	N	BL02	UMCf	97.4 - 107.4	2.44	0.612 J	<0.605	2.22	<0.116	<0.192	5,540	<0.960	<0.126	<0.111	0.584 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-11D	9/26/2022	N	EM01	UMCf	97.4 - 107.4	<6.80	<6.45	<30.3	<6.40	<5.80											

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B															
						Bromodichloromethane	Bromoform	Bromomethane	Carbon Tetrachloride	Chlorobenzene	Chloroethane	Chloroform	Chloromethane	cis-1,2-Dichloroethene	cis-1,3-Dichloropropene	Dibromochloromethane	Dibromomethane	Dichlorodifluoromethane	Diisopropyl Ether (DIPE)	Ethyl Tert-Butyl Ether (ETBE)	Ethylbenzene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-12I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	91.3	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-12I	12/7/2022	FD	EM04	UMCf	76.8 - 86.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	90.0	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-12I	1/13/2023	N	EM05	UMCf	76.8 - 86.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	36.5	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-13D	4/14/2022	N	BL02	UMCf	98.2 - 108.2	1.63	0.706 J	<0.605	1.11	<0.116	<0.192	3,460	<0.960	<0.126	<0.111	0.639 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-13D	9/28/2022	N	EM01	UMCf	98.2 - 108.2	<1.36	<1.29	<6.05	<1.28	<1.16	<1.92	1,270	<9.60	<1.26	<1.11	<1.40	<1.22	<3.74	<1.05	<1.01	<1.37
U4-MW-13D	10/11/2022	N	EM02	UMCf	98.2 - 108.2	0.628 J	<0.129	<0.605	<0.128	<0.116	<0.192	983	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-13D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	1.01 J+	0.198 J	<0.605	0.415 J	<0.116	<0.192	1,060	<0.960	<0.126	<0.111	0.551 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-13D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	1.83	0.233 J	<0.605	<0.128	<0.116	<0.192	874	<0.960	<0.126	<0.111	1.04	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-13D	1/12/2023	N	EM05	UMCf	98.2 - 108.2	<2.72	<2.58	<12.1	<2.56	<2.32	<3.84	837	<19.2	<2.52	<2.22	<2.80	<2.44	<7.48	<2.10	<2.02	<2.74
U4-MW-13I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	1.18	0.624 J	<0.605	0.865 J	<0.116	<0.192	1,350	<0.960	<0.126	<0.111	0.618 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-13I	9/28/2022	N	EM01	UMCf	77.1 - 87.1	0.584 J	<0.129	<0.605	0.400 J	<0.116	<0.192	154 J-	<0.960	<0.126	<0.111	0.164 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-13I	10/10/2022	N	EM02	UMCf	77.1 - 87.1	0.505 J	<0.129	<0.605	0.759 J	<0.116	<0.192	451	<0.960	0.394 J	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-13I	11/3/2022	N	EM03	UMCf	77.1 - 87.1	0.580 J	<0.129	<0.605	0.426 J	<0.116	<0.192	441	<0.960	<0.126	<0.111	0.159 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-13I	12/6/2022	N	EM04	UMCf	77.1 - 87.1	<0.680 UJ	<0.645 UJ	<3.03 UJ	<0.640 UJ	<0.580 UJ	<0.960 UJ	305	<4.80 UJ	<0.630 UJ	<0.555 UJ	<0.700 UJ	<0.610 UJ	<1.87 UJ	<0.525 UJ	<0.505 UJ	<0.685 UJ
U4-MW-13I	1/12/2023	N	EM05	UMCf	77.1 - 87.1	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	236	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-14D	4/13/2022	N	BL02	UMCf	97.3 - 107.3	0.920 J	0.628 J	<0.605	0.805 J	<0.116	<0.192	110 J	<0.960	<0.126	<0.111	0.561 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-14D	12/6/2022	N	EM04	UMCf	97.3 - 107.3	1.17 J	<0.645 UJ	<3.03 UJ	1.27 J	<0.580 UJ	<0.960 UJ	287	<4.80 UJ	<0.630 UJ	<0.555 UJ	0.751 J	<0.610 UJ	<1.87 UJ	<0.525 UJ	<0.505 UJ	<0.685 UJ
U4-MW-14I	4/14/2022	N	BL02	UMCf	77.3 - 87.3	0.557 J	0.536 J	<0.605	0.537 J	<0.116	<0.192	157	<0.960	<0.126	<0.111	0.471 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-14I	12/6/2022	N	EM04	UMCf	77.3 - 87.3	<0.680 UJ	<0.645 UJ	<3.03 UJ	1.27 J	<0.580 UJ	<0.960 UJ	212	<4.80 UJ	<0.630 UJ	<0.555 UJ	<0.700 UJ	<0.610 UJ	<1.87 UJ	<0.525 UJ	<0.505 UJ	<0.685 UJ
U4-MW-15D	4/13/2022	N	BL02	UMCf	96.0 - 106.0	0.402 J	<0.129	<0.605	<0.128	<0.116	<0.192	407 J+	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-15D	12/5/2022	N	EM04	UMCf	96.0 - 106.0	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	165	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-15DD	4/13/2022	N	BL02	UMCf	120.3 - 130.3	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	13.2 J+	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-15DD	12/5/2022	N	EM04	UMCf	120.3 - 130.3	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	0.237 J	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-15I	4/12/2022	N	BL02	UMCf	76.8 - 86.8	0.609 J	0.428 J	<0.605	0.809 J	<0.116	<0.192	705	<0.960	<0.126	<0.111	0.447 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-15I	12/5/2022	N	EM04	UMCf	76.8 - 86.8	0.582 J	<0.129	<0.605	0.371 J	<0.116	<0.192	758	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-15S	4/13/2022	N	BL02	UMCf	54.8 - 64.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	9.07 J+	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-15S	12/5/2022	N	EM04	UMCf	54.8 - 64.8	<3.40	<3.22	<15.1	<3.20	<2.90	<4.80	8.04 J	<24.0	<3.15	<2.78	<3.50	<3.05	<9.35	<2.63	<2.53	<3.43
U4-MW-16D	4/11/2022	N	BL02	UMCf	96.8 - 106.8	1.91	0.510 J	<0.605	<0.128	<0.116	<0.192	3,310	<0.960	<0.126	<0.111	0.533 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-16D	12/5/2022	N	EM04	UMCf	96.8 - 106.8	0.840 J	0.281 J	<0.605	0.646 J	<0.116	<0.192	2,020	<0.960	<0.126	<0.111	0.216 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-16DD	4/12/2022	N	BL02	UMCf	120.8 - 130.8	<0.136	<0.129	<0.605	0.369 J	<0.116	<0.192	121	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-16DD	12/5/2022	N	EM04	UMCf	120.8 - 130.8	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	43.7	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-16I	4/11/2022	N	BL02	UMCf	77.0 - 87.0	0.794 J	0.154 J	<0.605	<0.128	<0.116	<0.192	424	<0.960	<0.126	<0.111	0.256 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-16I	12/5/2022	N	EM04	UMCf	77.0 - 87.0	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	7.96	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-16I	12/5/2022	FD	EM04	UMCf	77.0 - 87.0	<0.136	<0.129	<0.605	<0.128	<0.116	<0.192	8.00	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-16S	4/12/2022	N	BL02	UMCf	54.8 - 64.8	0.323 J	<0.129	<0.605	0.365 J	<0.116	<0.192	12.8	<0.960	<0.126	<0.111	0.363 J	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-16S	4/12/2022	FD	BL02	UMCf	54.8 - 64.8	0.308 J	<0.129	<0.605	0.346 J	<0.116	<0.192	12.3	<0.960	<0.126	<0.111	<0.140	<0.122	<0.374	<0.105	<0.101	<0.137
U4-MW-16S	12/6/2022	N	EM04	UMCf	54.8 - 64.8	0.193 J	<0.129 UJ	<0.605 UJ	<0.128 UJ	<0.116 UJ	<0.192 UJ	7.61	<0.960 UJ	<0.126 UJ	<0.111 UJ	<0.140 UJ	<0.122 UJ	<0.374 UJ	<0.105 UJ	<0.101 UJ	<0.137 UJ
U4-SLMW	11/10/2022	N	EM03		-	1.60 J	<0.645	<3.03	<0.640	<0.580	<0.960	1.75 J	<4.80	<0.630	<0.555	1.52 J	<0.610	<1.87	<0.525	<0.505	<0.685
U4-T3	10/13/2022	N	EM02		-	4.01	1.87	<0.605	<0.128	<0.116	<0.192	3,720	<0.960	<0.126	<0.111	2.05	<0.122	<0.374	<0.105	<0.101	<0.137
U4-T3	11/3/2022	N	EM03		-	5.54	2.33	<0.605	2.09	<0.116	<0.192	3,460	<0.960	<0.126	<0.111	3.01 J+	<0.122	<0.374	<0.105	<0.101	<0.137
U4-T3	12/6/2022	N	EM04		-	3.81 J	<2.58 UJ	<12.1 UJ	6.19 J	<2.32 UJ	<3.84 UJ	2,520	<19.2 UJ	<2.52 UJ	<2.22 UJ	<2.80 UJ	<2.44 UJ	<7.48 UJ	<2.10 UJ	<2.02 UJ	<2.74 UJ
U4-T3	1/9/2023	N	EM05		-	4.50	1.86	<0.605	1.63	<0.116	<0.192	3,390	<0.960	<0.126	<0.111	2.19	<0.122	<0.374	<0.105	<0.101	<0.137

Notes:  
 FD - Field duplicate  
 E - Field instrument error.  
 J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.  
 J- - The result is an estimated quantity, but the result may be biased low.  
 J+ - The result is an estimated quantity, but the result may be biased high.  
 mg/L - milligrams per liter  
 µg/L - micrograms per liter  
 N - Normal field sample  
 R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.  
 UMCf- Upper Muddy Creek Formation  
 < - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.  
 -- Not tested.

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																		
						Hexachlorobutadiene	Isopropylbenzene	m,p-Xylene (Sum of Isomers)	Methylene Chloride	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	p-Cymene (p-Isopropyltoluene)	sec-Butylbenzene	Styrene	tert-Amyl Methyl Ether	tert-Butyl Alcohol	tert-Butyl Methyl Ether (MTBE)	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
M-247-100	4/20/2022	N	BL02	UMCf	100.5 - 110.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
M-249-100	4/20/2022	N	BL02	UMCf	99.6 - 109.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	
M-251-100	4/19/2022	N	BL02	UMCf	92.5 - 102.5	<0.337	<0.105	<0.430	1.11 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-251-100	10/13/2022	N	EM02	UMCf	92.5 - 102.5	<0.337	<0.105	<0.430	0.845 J	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	12.5 J+	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-251-100	11/2/2022	N	EM03	UMCf	92.5 - 102.5	<3.37	<1.05	<4.30	<4.30	<10.0	<1.57	<0.993	<1.74	<1.20	<1.25	<1.18	<1.95	<40.6	<1.01	<1.27	<3.00	<2.78	<1.49	<1.18
M-251-100	12/8/2022	N	EM04	UMCf	92.5 - 102.5	<0.337	<0.105	<0.430	0.576 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-251-100	1/11/2023	N	EM05	UMCf	92.5 - 102.5	<0.337	<0.105	<0.430	0.536 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-251-60	4/18/2022	N	BL02	UMCf	52.3 - 62.3	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
M-252	4/21/2022	N	BL02	UMCf	132.3 - 142.3	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.292 J	<0.149	<0.118
M-253-100	4/20/2022	N	BL02	UMCf	100.8 - 110.8	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
M-255-100	4/20/2022	N	BL02	UMCf	100.2 - 110.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
U4-E-01D	4/18/2022	N	BL02	UMCf	94.7 - 109.7	<1.69	<0.525	<2.15	<2.15	<5.00	<0.785 UJ	<0.497	<0.870	<0.600	<0.625	<0.590 UJ	<0.975	<20.3 UJ	<0.505	<0.635	<1.50	<1.39	<0.745	<0.590
U4-E-01I	4/19/2022	N	BL02	UMCf	74.6 - 89.6	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	6.58	<0.101	<0.127	<0.300	0.471 J	<0.149	<0.118
U4-E-01I	4/19/2022	FD	BL02	UMCf	74.6 - 89.6	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.05	<0.101	<0.127	<0.300	<0.330 J	<0.149	<0.118
U4-E-02D	4/20/2022	N	BL02	UMCf	94.4 - 109.4	<0.337	<0.105	<0.430	0.478 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.644 J	<0.149	<0.118
U4-E-02I	4/18/2022	N	BL02	UMCf	74.4 - 89.4	<0.337	<0.105	<0.430 UJ	<0.430	<1.00 UJ	<0.157 UJ	<0.0993 UJ	<0.174 UJ	<0.120	<0.125 UJ	<0.118 R	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-03D	4/19/2022	N	BL02	UMCf	95.1 - 110.1	<0.337	<0.105	<0.430	0.797 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	6.74	<0.101	<0.127	<0.300	0.333 J	<0.149	<0.118
U4-E-03D	10/13/2022	N	EM02	UMCf	95.1 - 110.1	<67.4	<21.0	<86.0	<86.0	<200 UJ	<31.4	<19.9	<34.8	<24.0	<25.0	<23.6	<39.0	<812	<20.2	<25.4	<60.0	<55.6	<29.8	<23.6
U4-E-03D	11/3/2022	N	EM03	UMCf	95.1 - 110.1	<0.337	<0.105	<0.430	0.543 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.494 J	<0.278	<0.149	<0.118
U4-E-03D	12/6/2022	N	EM04	UMCf	95.1 - 110.1	<6.74 UJ	<2.10 UJ	<8.60 UJ	<8.60 UJ	<20.0 UJ	<3.14 UJ	<1.99 UJ	<3.48 UJ	<2.40 UJ	<2.50 UJ	<2.36 UJ	<3.90 UJ	<81.2 UJ	<2.02 UJ	<2.54 UJ	<6.00 UJ	<5.56 UJ	<2.98 UJ	<2.36 UJ
U4-E-03D	1/9/2023	N	EM05	UMCf	95.1 - 110.1	<0.337	<0.105	<0.430	0.516 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.342 J	<0.278	<0.149	<0.118
U4-E-04D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.71	<0.101	<0.127	<0.300	0.341 J	<0.149	<0.118
U4-E-04I	4/18/2022	N	BL02	UMCf	75.0 - 90.0	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	4.31 J	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-05D	4/19/2022	N	BL02	UMCf	95.0 - 110.0	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.513 J	<0.149	<0.118
U4-E-05I	4/19/2022	N	BL02	UMCf	75.0 - 90.0	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-06D	4/11/2022	N	BL02	UMCf	95.1 - 110.1	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118 R	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-06I	4/11/2022	N	BL02	UMCf	73.2 - 88.2	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-06I	4/11/2022	FD	BL02	UMCf	73.2 - 88.2	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-06I	10/12/2022	N	EM02	UMCf	73.2 - 88.2	<0.337	<0.105	<0.430	0.976 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.450 J	<0.278	<0.149	<0.118
U4-E-06I	11/3/2022	N	EM03	UMCf	73.2 - 88.2	<0.337	<0.105	<0.430	2.60 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.389 J	<0.278	<0.149	<0.118
U4-E-06I	12/6/2022	N	EM04	UMCf	73.2 - 88.2	<3.37 UJ	<1.05 UJ	<4.30 UJ	6.34 J	<10.0 UJ	<1.57 UJ	<0.993 UJ	<1.74 UJ	<1.20 UJ	<1.25 UJ	<1.18 UJ	<1.95 UJ	<40.6 UJ	<1.01 UJ	<1.27 UJ	<3.00 UJ	<2.78 UJ	<1.49 UJ	<1.18 UJ
U4-E-06I	1/9/2023	N	EM05	UMCf	73.2 - 88.2	<0.337	<0.105	<0.430	2.99 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.300 J	<0.278	<0.149	<0.118
U4-E-07D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	<0.337	<0.105	<0.430	0.637 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	4.41 J	<0.101	<0.127	<0.300	3.53	<0.149	<0.118
U4-E-07I	4/12/2022	N	BL02	UMCf	74.7 - 89.7	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	13.0	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-E-07I	10/11/2022	N	EM02	UMCf	74.7 - 89.7	<3.37	<1.05	<4.30	<4.30	<10.0	<1.57	<0.993	<1.74	<1.20	<1.25	<1.18	<1.95	<40.6	<1.01	<1.27	<3.00	<2.78	<1.49	<1.18
U4-E-07I	11/3/2022	N	EM03	UMCf	74.7 - 89.7	<0.337	<0.105	<0.430	2.44 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.397 J	<0.278	<0.149	<0.118
U4-E-07I	12/6/2022	N	EM04	UMCf	74.7 - 89.7	<8.43 UJ	<2.63 UJ	<10.7 UJ	<10.7 UJ	<25.0 UJ	<3.93 UJ	<2.48 UJ	<4.35 UJ	<3.00 UJ	<3.13 UJ	<2.95 UJ	<4.88 UJ	<102 UJ	<2.53 UJ	<3.18 UJ	<7.50 UJ	<6.95 UJ	<3.73 UJ	<2.95 UJ
U4-E-07I	1/9/2023	N	EM05	UMCf	74.7 - 89.7	<0.337	<0.105	<0.430	0.747 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.370 J	<0.278	<0.149	<0.118
U4-E-08D	4/12/2022	N	BL02	UMCf	94.6 - 109.6	<0.337	<0.105	<0.430	0.819 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.12	<0.101	<0.127	<0.300	1.49	<0.149	<0.118
U4-E-08D	10/11/2022	N	EM02	UMCf	94.6 - 109.6	<3.37	<1.05	<4.30	<4.30	<10.0	<1.57	<0.993	<1.74	<1.20	<1.25	<1.18	<1.95	<40.6	<1.01	<1.27	<3.00	<2.78	<1.49	<1.18
U4-E-08D	11/3/2022	N	EM03	UMCf	94.6 - 109.6	<0.337	<0.105	<0.430	0.540 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.399 J	<0.278	<0.149	<0.118
U4-E-08D	12/6/2022	N	EM04	UMCf	94.6 - 109.6	<8.43 UJ	<2.63 UJ	<10.7 UJ	<10.7 UJ	<25.0 UJ	<3.93 UJ	<2.48 UJ	<4.35 UJ	<3.00 UJ	<3.13 UJ	<2.95 U								

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																		
						Hexachlorobutadiene	Isopropylbenzene	m,p-Xylene (Sum of Isomers)	Methylene Chloride	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	p-Cymene (p-Isopropyltoluene)	sec-Butylbenzene	Styrene	tert-Amyl Methyl Ether	tert-Butyl Alcohol	tert-Butyl Methyl Ether (MTBE)	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-05D	10/13/2022	N	EM02	UMCf	98.2 - 108.2	<33.7	<10.5	<43.0	<43.0	<100 UJ	<15.7	<9.93	<17.4	<12.0	<12.5	<11.8	<19.5	<406	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-MW-05D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	<0.337	<0.105	<0.430	0.767 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	<0.337	<0.105	<0.430	0.757 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	6.34	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05D	1/11/2023	N	EM05	UMCf	98.2 - 108.2	<0.337	<0.105	<0.430	0.566 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05I	4/15/2022	N	BLO2	UMCf	76.6 - 86.6	<0.337	<0.105	<0.430	<0.430	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05I	10/13/2022	N	EM02	UMCf	76.6 - 86.6	<33.7	<10.5	<43.0	<43.0	<100 UJ	<15.7	<9.93	<17.4	<12.0	<12.5	<11.8	<19.5	<406	<10.1	<12.7	<30.0	<27.8	<14.9	<11.8
U4-MW-05I	11/3/2022	N	EM03	UMCf	76.6 - 86.6	<0.337	<0.105	<0.430	0.570 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.354 J	<0.278	<0.149	<0.118
U4-MW-05I	12/8/2022	N	EM04	UMCf	76.6 - 86.6	<0.337	<0.105	<0.430	0.635 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-05I	1/11/2023	N	EM05	UMCf	76.6 - 86.6	<0.337	<0.105	<0.430	0.474 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	0.331 J	<0.278	<0.149	<0.118
U4-MW-06D	4/19/2022	N	BLO2	UMCf	97.1 - 107.1	<0.337	<0.105	<0.430	1.58 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-06I	4/19/2022	N	BLO2	UMCf	76.5 - 86.5	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.332 J	<0.149	<0.118
U4-MW-07D	4/15/2022	N	BLO2	UMCf	96.8 - 106.5	<0.337	<0.105	<0.430	<0.430	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.04 J	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07D	10/12/2022	N	EM02	UMCf	96.8 - 106.5	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	0.181 J	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.557 J	<0.149	<0.118
U4-MW-07D	10/12/2022	FD	EM02	UMCf	96.8 - 106.5	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.576 J	<0.149	<0.118
U4-MW-07D	11/3/2022	N	EM03	UMCf	96.8 - 106.5	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07D	12/7/2022	N	EM04	UMCf	96.8 - 106.5	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07D	1/11/2023	N	EM05	UMCf	96.8 - 106.5	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07I	4/15/2022	N	BLO2	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	<0.430	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07I	10/12/2022	N	EM02	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	0.478 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.315 J	<0.149	<0.118
U4-MW-07I	11/3/2022	N	EM03	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-07I	1/11/2023	N	EM05	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08D	4/13/2022	N	BLO2	UMCf	98.6 - 108.6	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	8.05	<0.101	<0.127	2.63	<0.278	<0.149	<0.118
U4-MW-08D	12/7/2022	N	EM04	UMCf	98.6 - 108.6	<0.337	<0.105	<0.430	0.846 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08DD	4/20/2022	N	BLO2	UMCf	119.8 - 129.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.486 J	<0.149	<0.118
U4-MW-08DD	4/20/2022	FD	BLO2	UMCf	119.8 - 129.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.531 J	<0.149	<0.118
U4-MW-08DD	12/8/2022	N	EM04	UMCf	119.8 - 129.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08I	4/13/2022	N	BLO2	UMCf	78.0 - 88.0	<0.337	<0.105	<0.430	1.14 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	6.37	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08I	12/7/2022	N	EM04	UMCf	78.0 - 88.0	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	5.48	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08I	12/7/2022	FD	EM04	UMCf	78.0 - 88.0	<0.337	<0.105	<0.430	0.436 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08S	4/15/2022	N	BLO2	UMCf	54.9 - 64.9	<0.337	<0.105	<0.430	<0.430	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08S	12/7/2022	N	EM04	UMCf	54.9 - 64.9	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-08S	12/7/2022	FD	EM04	UMCf	54.9 - 64.9	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-09D	4/14/2022	N	BLO2	UMCf	96.9 - 106.9	<0.337	<0.105	<0.430	0.520 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-09D	12/6/2022	N	EM04	UMCf	96.9 - 106.9	<3.37 UJ	<1.05 UJ	<4.30 UJ	<4.30 UJ	<10.0 UJ	<1.57 UJ	<0.993 UJ	<1.74 UJ	<1.20 UJ	<1.25 UJ	<1.18 UJ	<1.95 UJ	<40.6 UJ	<1.01 UJ	<1.27 UJ	<3.00 UJ	<2.78 UJ	<1.49 UJ	<1.18 UJ
U4-MW-09DD	4/14/2022	N	BLO2	UMCf	119.8 - 129.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-09DD	12/6/2022	N	EM04	UMCf	119.8 - 129.8	<0.337 UJ	<0.105 UJ	<0.430 UJ	<0.430 UJ	<1.00 UJ	<0.157 UJ	<0.0993 UJ	<0.174 UJ	<0.120 UJ	<0.125 UJ	<0.118 UJ	<0.195 UJ	<40.6 UJ	<1.01 UJ	<1.27 UJ	<0.300 UJ	<0.278 UJ	<0.149 UJ	<0.118 UJ
U4-MW-09I	4/14/2022	N	BLO2	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	0.326 J	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	3.30	<0.149	<0.118
U4-MW-09I	12/6/2022	N	EM04	UMCf	76.8 - 86.8	<3.37 UJ	<1.05 UJ	<4.30 UJ	<4.30 UJ	<10.0 UJ	<1.57 UJ	<0.993 UJ	<1.74 UJ	<1.20 UJ	<1.25 UJ	<1.18 UJ	<1.95 UJ	<40.6 UJ	<1.01 UJ	<1.27 UJ	<3.00 UJ	<2.78 UJ	<1.49 UJ	<1.18 UJ
U4-MW-09S	4/14/2022	N	BLO2	UMCf	55.3 - 65.3	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120										

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B																		
						Hexachlorobutadiene	Isopropylbenzene	m,p-Xylene (Sum of Isomers)	Methylene Chloride	Naphthalene	n-Butylbenzene	n-Propylbenzene	o-Xylene	p-Cymene (p-Isopropyltoluene)	sec-Butylbenzene	Styrene	tert-Amyl Methyl Ether	tert-Butyl Alcohol	tert-Butyl Methyl Ether (MTBE)	tert-Butylbenzene	Tetrachloroethene (PCE)	Toluene	trans-1,2-Dichloroethene	trans-1,3-Dichloropropene
						µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L	µg/L
U4-MW-12I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	4.69 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12I	12/7/2022	FD	EM04	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	4.62 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-12I	1/13/2023	N	EM05	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	1.37 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13D	4/14/2022	N	BL02	UMCf	98.2 - 108.2	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	7.16	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13D	9/28/2022	N	EM01	UMCf	98.2 - 108.2	<3.37	<1.05	<4.30	5.02 J	<10.0	<1.57	<0.993	<1.74	<1.20	<1.25	<1.18	<1.95	<4.06	<1.01	<1.27	<3.00	<2.78	<1.49	<1.18
U4-MW-13D	10/11/2022	N	EM02	UMCf	98.2 - 108.2	<0.337	<0.105	<0.430	0.543 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	<0.337	<0.105	<0.430	0.508 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	<0.337	<0.105	<0.430	0.439 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13D	11/2/2023	N	EM05	UMCf	98.2 - 108.2	<6.74	<2.10	<8.60	<8.60	<20.0	<3.14	<1.99	<3.48	<2.40	<2.50	<2.36	<3.90	<81.2	<2.02	<2.54	<6.00	<5.56	<2.98	<2.36
U4-MW-13I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	4.13 J	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13I	9/28/2022	N	EM01	UMCf	77.1 - 87.1	<0.337	<0.105	<0.430	<0.430	2.01 J	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	0.395 J	<0.149	<0.118
U4-MW-13I	10/10/2022	N	EM02	UMCf	77.1 - 87.1	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	5.02	0.914 J	<0.149	<0.118
U4-MW-13I	11/3/2022	N	EM03	UMCf	77.1 - 87.1	<0.337	<0.105	<0.430	0.573 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-13I	12/6/2022	N	EM04	UMCf	77.1 - 87.1	<1.69 UJ	<0.525 UJ	<2.15 UJ	7.70 J	<5.00 UJ	<0.785 UJ	<0.497 UJ	<0.870 UJ	<0.600 UJ	<0.625 UJ	<0.590 UJ	<0.975 UJ	<20.3 UJ	<0.505 UJ	<0.635 UJ	<1.50 UJ	<1.39 UJ	<0.745 UJ	<0.590 UJ
U4-MW-13I	11/2/2023	N	EM05	UMCf	77.1 - 87.1	<0.337	<0.105	<0.430	1.03 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-14D	4/13/2022	N	BL02	UMCf	97.3 - 107.3	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-14D	12/6/2022	N	EM04	UMCf	97.3 - 107.3	<1.69 UJ	<0.525 UJ	<2.15 UJ	<2.15 UJ	<5.00 UJ	<0.785 UJ	<0.497 UJ	<0.870 UJ	<0.600 UJ	<0.625 UJ	<0.590 UJ	<0.975 UJ	<20.3 UJ	<0.505 UJ	<0.635 UJ	<1.50 UJ	<1.39 UJ	<0.745 UJ	<0.590 UJ
U4-MW-14I	4/14/2022	N	BL02	UMCf	77.3 - 87.3	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	6.75	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-14I	12/6/2022	N	EM04	UMCf	77.3 - 87.3	<1.69 UJ	<0.525 UJ	<2.15 UJ	<2.15 UJ	<5.00 UJ	<0.785 UJ	<0.497 UJ	<0.870 UJ	<0.600 UJ	<0.625 UJ	<0.590 UJ	<0.975 UJ	<20.3 UJ	<0.505 UJ	<0.635 UJ	<1.50 UJ	<1.39 UJ	<0.745 UJ	<0.590 UJ
U4-MW-15D	4/13/2022	N	BL02	UMCf	96.0 - 106.0	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-15D	12/5/2022	N	EM04	UMCf	96.0 - 106.0	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-15DD	4/13/2022	N	BL02	UMCf	120.3 - 130.3	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	4.48 J	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-15DD	12/5/2022	N	EM04	UMCf	120.3 - 130.3	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-15I	4/12/2022	N	BL02	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-15I	12/5/2022	N	EM04	UMCf	76.8 - 86.8	<0.337	<0.105	<0.430	1.81 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-15S	4/13/2022	N	BL02	UMCf	54.8 - 64.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-15S	12/5/2022	N	EM04	UMCf	54.8 - 64.8	<8.43	<2.63	<10.7	<10.7	<25.0	<3.93	<2.48	<4.35	<3.00	<3.13	<2.95	<4.88	<102	<2.53	<3.18	<7.50	<6.95	<3.73	<2.95
U4-MW-16D	4/11/2022	N	BL02	UMCf	96.8 - 106.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-16D	12/5/2022	N	EM04	UMCf	96.8 - 106.8	<0.337	<0.105	<0.430	1.30 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-16DD	4/12/2022	N	BL02	UMCf	120.8 - 130.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-16DD	12/5/2022	N	EM04	UMCf	120.8 - 130.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-16I	4/11/2022	N	BL02	UMCf	77.0 - 87.0	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-16I	12/5/2022	N	EM04	UMCf	77.0 - 87.0	<0.337	<0.105	<0.430	5.10	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-16I	12/5/2022	FD	EM04	UMCf	77.0 - 87.0	<0.337	<0.105	<0.430	5.03	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-16S	4/12/2022	N	BL02	UMCf	54.8 - 64.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-16S	4/12/2022	FD	BL02	UMCf	54.8 - 64.8	<0.337	<0.105	<0.430	<0.430	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	<4.06	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-MW-16S	12/6/2022	N	EM04	UMCf	54.8 - 64.8	<0.337 UJ	<0.105 UJ	<0.430 UJ	0.573 J	<1.00 UJ	<0.157 UJ	<0.0993 UJ	<0.174 UJ	<0.120 UJ	<0.125 UJ	<0.118 UJ	<0.195 UJ	<4.06 UJ	<0.101 UJ	<0.127 UJ	<0.300 UJ	<0.278 UJ	<0.149 UJ	<0.118 UJ
U4-SLMW	11/10/2022	N	EM03		-	<1.69	<0.525	<2.15	<2.15	<5.00	<0.785	<0.497	<0.870	<0.600	<0.625	<0.590	<0.975	<20.3	<0.505	<0.635	<1.50	<1.39	<0.745	<0.590
U4-T3	10/13/2022	N	EM02		-	<0.337	<0.105	<0.430	0.687 J	<1.00 UJ	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118	<0.195	35.0 J+	<0.101	<0.127	<0.300	<0.278	<0.149	<0.118
U4-T3	11/3/2022	N	EM03		-	<0.337	<0.105	<0.430	0.879 J	<1.00	<0.157	<0.0993	<0.174	<0.120	<0.125	<0.118								





Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B				SW9060A/SM5 310B	Volatile Fatty Acids by AM23G										
						Trichloroethene (TCE)	Trichlorofluoromethane	Vinyl Chloride	Xylenes, Total		Total Organic Carbon	3-Methylbutanoic Acid	Acetic Acid	Butyric Acid	Formic Acid	Hexanoic Acid	i-Hexanoic Acid	Lactic Acid	Pentanoic Acid	Propionic Acid	Pyruvic Acid
						µg/L	µg/L	µg/L	µg/L		µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
U4-MW-05D	10/13/2022	N	EM02	UMCf	98.2 - 108.2	<19.0	<16.0	<23.4	<17.4	1,300 J	---	---	---	---	---	---	---	---	---		
U4-MW-05D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	0.421 J	<0.160	<0.234	<0.174	1,450 J+	---	---	---	---	---	---	---	---	---		
U4-MW-05D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	0.543 J	<0.160	0.238 J	<0.174	1,200 J+	---	---	---	---	---	---	---	---	---		
U4-MW-05D	1/11/2023	N	EM05	UMCf	98.2 - 108.2	0.492 J	<0.160	<0.234	<0.174	1,200 J+	---	---	---	---	---	---	---	---	---		
U4-MW-05I	4/15/2022	N	BLO2	UMCf	76.6 - 86.6	0.500 J	<0.160	<0.234	<0.174	1,460 J+	---	---	---	---	---	---	---	---	---		
U4-MW-05I	10/13/2022	N	EM02	UMCf	76.6 - 86.6	<19.0	<16.0	<23.4	<17.4	1,180 J	---	---	---	---	---	---	---	---	---		
U4-MW-05I	11/3/2022	N	EM03	UMCf	76.6 - 86.6	0.797 J	<0.160	<0.234	<0.174	1,370 J+	---	---	---	---	---	---	---	---	---		
U4-MW-05I	12/8/2022	N	EM04	UMCf	76.6 - 86.6	0.693 J	<0.160	<0.234	<0.174	1,630 J+	---	---	---	---	---	---	---	---	---		
U4-MW-05I	1/11/2023	N	EM05	UMCf	76.6 - 86.6	0.592 J	<0.160	<0.234	<0.174	1,400 J+	---	---	---	---	---	---	---	---	---		
U4-MW-06D	4/19/2022	N	BLO2	UMCf	97.1 - 107.1	0.524 J	<0.160	<0.234	<0.174	1,350 J+	---	---	---	---	---	---	---	---	---		
U4-MW-06I	4/19/2022	N	BLO2	UMCf	76.5 - 86.5	<0.190	<0.160	<0.234	<0.174	1,190 J+	---	---	---	---	---	---	---	---	---		
U4-MW-07D	4/15/2022	N	BLO2	UMCf	96.8 - 106.5	0.191 J	<0.160	<0.234	<0.174	631 J	---	---	---	---	---	---	---	---	---		
U4-MW-07D	10/12/2022	N	EM02	UMCf	96.8 - 106.5	<0.190	<0.160	<0.234	0.181 J	1,630 J+	---	---	---	---	---	---	---	---	---		
U4-MW-07D	10/12/2022	FD	EM02	UMCf	96.8 - 106.5	<0.190	<0.160	<0.234	<0.174	1,490 J+	---	---	---	---	---	---	---	---	---		
U4-MW-07D	11/3/2022	N	EM03	UMCf	96.8 - 106.5	<0.190	<0.160	<0.234	<0.174	1,680 J+	---	---	---	---	---	---	---	---	---		
U4-MW-07D	12/7/2022	N	EM04	UMCf	96.8 - 106.5	<0.190	<0.160	<0.234	<0.174	1,580 J+	---	---	---	---	---	---	---	---	---		
U4-MW-07D	1/11/2023	N	EM05	UMCf	96.8 - 106.5	<0.190	<0.160	<0.234	<0.174	1,480 J+	---	---	---	---	---	---	---	---	---		
U4-MW-07I	4/15/2022	N	BLO2	UMCf	76.8 - 86.8	<0.190	<0.160	<0.234	<0.174	2,760 J+	---	---	---	---	---	---	---	---	---		
U4-MW-07I	10/12/2022	N	EM02	UMCf	76.8 - 86.8	<0.190	<0.160	<0.234	<0.174	1,370 J+	---	---	---	---	---	---	---	---	---		
U4-MW-07I	11/3/2022	N	EM03	UMCf	76.8 - 86.8	<0.190	<0.160	<0.234	<0.174	1,530 J+	---	---	---	---	---	---	---	---	---		
U4-MW-07I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<0.190	<0.160	<0.234	<0.174	1,630 J+	---	---	---	---	---	---	---	---	---		
U4-MW-07I	1/11/2023	N	EM05	UMCf	76.8 - 86.8	<0.190	<0.160	<0.234	<0.174	1,420 J+	---	---	---	---	---	---	---	---	---		
U4-MW-08D	4/13/2022	N	BLO2	UMCf	98.6 - 108.6	<0.190	<0.160	<0.234	<0.174	3,420 J	---	---	---	---	---	---	---	---	---		
U4-MW-08D	12/7/2022	N	EM04	UMCf	98.6 - 108.6	0.670 J	<0.160	<0.234	<0.174	6,460	---	---	---	---	---	---	---	---	---		
U4-MW-08DD	4/20/2022	N	BLO2	UMCf	119.8 - 129.8	<0.190	<0.160	<0.234	<0.174	670 J	---	---	---	---	---	---	---	---	---		
U4-MW-08DD	4/20/2022	FD	BLO2	UMCf	119.8 - 129.8	<0.190	<0.160	<0.234	<0.174	672 J	---	---	---	---	---	---	---	---	---		
U4-MW-08DD	12/8/2022	N	EM04	UMCf	119.8 - 129.8	<0.190	<0.160	<0.234	<0.174	1,170 J+	---	---	---	---	---	---	---	---	---		
U4-MW-08I	4/13/2022	N	BLO2	UMCf	78.0 - 88.0	0.904 J	<0.160	0.413 J	<0.174	1,740 J	---	---	---	---	---	---	---	---	---		
U4-MW-08I	12/7/2022	N	EM04	UMCf	78.0 - 88.0	0.466 J	<0.160	<0.234	<0.174	1,790 J+	---	---	---	---	---	---	---	---	---		
U4-MW-08I	12/7/2022	FD	EM04	UMCf	78.0 - 88.0	0.489 J	<0.160	<0.234	<0.174	1,310 J+	---	---	---	---	---	---	---	---	---		
U4-MW-08S	4/15/2022	N	BLO2	UMCf	54.9 - 64.9	<0.190	<0.160	<0.234	<0.174	1,190 J+	---	---	---	---	---	---	---	---	---		
U4-MW-08S	12/7/2022	N	EM04	UMCf	54.9 - 64.9	<0.190	<0.160	<0.234	<0.174	3,390 J+	---	---	---	---	---	---	---	---	---		
U4-MW-08S	12/7/2022	FD	EM04	UMCf	54.9 - 64.9	<0.190	<0.160	<0.234	<0.174	2,830 J+	---	---	---	---	---	---	---	---	---		
U4-MW-09D	4/14/2022	N	BLO2	UMCf	96.9 - 106.9	0.195 J	<0.160	<0.234	<0.174	1,590 J	---	---	---	---	---	---	---	---	---		
U4-MW-09D	12/6/2022	N	EM04	UMCf	96.9 - 106.9	<1.90 UJ	<1.60 UJ	<2.34 UJ	<1.74 UJ	751 J	---	---	---	---	---	---	---	---	---		
U4-MW-09DD	4/14/2022	N	BLO2	UMCf	119.8 - 129.8	<0.190	<0.160	<0.234	<0.174	493 J	---	---	---	---	---	---	---	---	---		
U4-MW-09DD	12/6/2022	N	EM04	UMCf	119.8 - 129.8	<0.190 UJ	<0.160 UJ	<0.234 UJ	<0.174 UJ	398 J	---	---	---	---	---	---	---	---	---		
U4-MW-09I	4/14/2022	N	BLO2	UMCf	76.8 - 86.8	<0.190	<0.160	<0.234	0.326 J	1,090 J+	---	---	---	---	---	---	---	---	---		
U4-MW-09I	12/6/2022	N	EM04	UMCf	76.8 - 86.8	<1.90 UJ	<1.60 UJ	<2.34 UJ	<1.74 UJ	1,040 J+	---	---	---	---	---	---	---	---	---		
U4-MW-09S	4/14/2022	N	BLO2	UMCf	55.3 - 65.3	<0.190	<0.160	<0.234	<0.174	892 J	---	---	---	---	---	---	---	---	---		
U4-MW-09S	12/6/2022	N	EM04	UMCf	55.3 - 65.3	<0.190 UJ	<0.160 UJ	<0.234 UJ	<0.174 UJ	999 J	---	---	---	---	---	---	---	---	---		
U4-MW-10D	4/14/2022	N	BLO2	UMCf	96.9 - 106.9	<0.190	<0.160	<0.234	<0.174	1,020 J+	---	---	---	---	---	---	---	---	---		
U4-MW-10D	12/5/2022	N	EM04	UMCf	96.9 - 106.9	<0.190	<0.160	<0.234	<0.174	868 J	---	---	---	---	---	---	---	---	---		
U4-MW-10I	4/14/2022	N	BLO2	UMCf	77.1 - 87.1	<0.190	<0.160	<0.234	<0.174	1,200 J+	---	---	---	---	---	---	---	---	---		
U4-MW-10I	12/5/2022	N	EM04	UMCf	77.1 - 87.1	<0.190	<0.160	<0.234	<0.174	3,630 J+	---	---	---	---	---	---	---	---	---		
U4-MW-11D	4/15/2022	N	BLO2	UMCf	97.4 - 107.4	0.873 J	<0.160	<0.234	<0.174	3,440 J+	<6.1	25 J	<5.8	460	<5.8	<5.6	<5.3	<5.6	<5.3	<6.0	
U4-MW-11D	9/26/2022	N	EM01	UMCf	97.4 - 107.4	<9.50	<8.00	<11.7	<8.70	20,200 J+	---	---	---	---	---	---	---	---	---		
U4-MW-11D	10/11/2022	N	EM02	UMCf	97.4 - 107.4	<1.90	<1.60	<2.34	<1.74	1,360 J+	---	---	---	---	---	---	---	---	---		
U4-MW-11D	11/1/2022	N	EM03	UMCf	97.4 - 107.4	<9.50	<8.00	<11.7	<8.70	1,820 J+	---	---	---	---	---	---	---	---	---		
U4-MW-11D	12/6/2022	N	EM04	UMCf	97.4 - 107.4	<4.75 UJ	<4.00 UJ	<5.85 UJ	<4.35 UJ	33,300	<3.0	27 J+	4.1 J	320 J+	<2.9	<2.8	6.7 J	<2.8	3.4 J	<3.0	
U4-MW-11D	1/12/2023	N	EM05	UMCf	97.4 - 107.4	<38.0	<32.0	<46.8	<34.8	5,100	---	---	---	---	---	---	---	---	---		
U4-MW-11I	4/14/2022	N	BLO2	UMCf	77.0 - 87.0	0.194 J	<0.160	<0.234	<0.174	1,040 J+	<1.2	3.6 J	<1.2	91	<1.2	<1.1	<1.1	<1.1	<1.2		
U4-MW-11I	9/26/2022	N	EM01	UMCf	77.0 - 87.0	<0.190	<0.160	<0.234	<0.174	208,000	---	---	---	---	---	---	---	---	---		
U4-MW-11I	9/26/2022	FD	EM01	UMCf	77.0 - 87.0	<0.190	<0.160	<0.234	<0.174	201,000	---	---	---	---	---	---	---	---	---		
U4-MW-11I	10/10/2022	N	EM02	UMCf	77.0 - 87.0	<1.90	<1.60	<2.34	<1.74	61,800 J	---	---	---	---	---	---	---	---	---		
U4-MW-11I	10/10/2022	FD	EM02	UMCf	77.0 - 87.0	0.631 J	<0.160	<0.234	<0.174	306,000 J	---	---	---	---	---	---	---	---	---		
U4-MW-11I	10/31/2022	N	EM03	UMCf	77.0 - 87.0	<0.950	<0.800	<1.17	<0.870	364,000	---	---	---	---	---	---	---	---	---		
U4-MW-11I	10/31/2022	FD	EM03	UMCf	77.0 - 87.0	<0.190	<0.160	<0.234	<0.174	370,000	---	---	---	---	---	---	---	---	---		
U4-MW-11I	12/6/2022	N	EM04	UMCf	77.0 - 87.0	<0.190 UJ	<0.160 UJ	<0.234 UJ	<0.174 UJ	55,800 J	<6.1 UJ	480 J-	11 J	21 J	<5.8 UJ	<5.6 UJ	8.7 J	<5.6 UJ	21 J	<6.0 UJ	
U4-MW-11I	12/6/2022	FD	EM04	UMCf	77.0 - 87.0	<0.190 UJ	<0.160 UJ	<0.234 UJ	<0.174 UJ	276,000 J	<6.1 UJ	490 J-	15 J	53 J	<5.8 UJ	<5.6 UJ	10 J	<5.6 UJ	26 J	<6.0 UJ	
U4-MW-11I	1/12/2023	N	EM05	UMCf	77.0 - 87.0	<0.190	<0.160	<0.234	<0.174	189,000 J-	---	---	---	---	---	---	---	---	---		
U4-MW-11I	1/12/2023	FD	EM05	UMCf	77.0 - 87.0	<0.190	<0.160	<0.234	<0.174	195,000 J-	---	---	---	---	---	---	---	---	---	---	
U4-MW-12D	4/15/2022	N	BLO2	UMCf	97.1 - 107.1	0.752 J	<0.160	<0.234	<0.174	1,440 J+	<6.1	26 J	<5.8	460	<5.8	43 J	<5.3	<5.6	<5.3	<6.0	
U4-MW-12D	9/27/2022	N	EM01	UMCf	97.1 - 107.1	<3.80	<3.20	<4.68	<3.48	903 J	---	---	---	---	---	---	---	---	---	---	
U4-MW-12D	10/12/2022	N	EM02	UMCf	97.1 - 107.1	0.684 J	<0.160	<0.234	<0.174	1,020 J+	---	---	---	---	---	---	---	---	---	---	
U4-MW-12D	11/2/2022	N	EM03	UMCf	97.1 - 107.1	<1.90	<1.60	<2.34	<1.74	469 J	---	---	---	---	---	---	---	---	---	---	
U4-MW-12D	12/7/2022	N	EM04	UMCf	97.1 - 107.1	0.741 J	<0.160	<0.234	<0.174												

Table 5  
Groundwater Analytical Results  
Unit 4 Source Area Bioremediation Treatability Study

Well	Sample Date	QC Type	Event	Screened Lithology	Screened Interval	Volatile Organic Compounds by SW8260B				SW9060A/SM5 310B	Volatile Fatty Acids by AM23G										
						Trichloroethene (TCE)	Trichlorofluoromethane	Vinyl Chloride	Xylenes, Total		Total Organic Carbon	3-Methylbutanoic Acid	Acetic Acid	Butyric Acid	Formic Acid	Hexanoic Acid	i-Hexanoic Acid	Lactic Acid	Pentanoic Acid	Propionic Acid	Pyruvic Acid
						µg/L	µg/L	µg/L	µg/L		µg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
U4-MW-12I	12/7/2022	N	EM04	UMCf	76.8 - 86.8	<0.190	<0.160	<0.234	<0.174	95,000	<1.2 R	170 J-	<1.2 R	110 J-	2.1 J	<1.1 R	6.9 J	<1.1 R	6.1 J	<1.2 R	
U4-MW-12I	12/7/2022	FD	EM04	UMCf	76.8 - 86.8	<0.190	<0.160	<0.234	<0.174	84,500	----	----	----	----	----	----	----	----	----	----	
U4-MW-12I	1/13/2023	N	EM05	UMCf	76.8 - 86.8	<0.190	<0.160	<0.234	<0.174	229,000	----	----	----	----	----	----	----	----	----	----	
U4-MW-13D	4/14/2022	N	BL02	UMCf	98.2 - 108.2	0.456 J	<0.160	<0.234	<0.174	1,640 J	<12	27 J	<12	490	<12	<11	<11	<11	<11	<12	
U4-MW-13D	9/28/2022	N	EM01	UMCf	98.2 - 108.2	<1.90	<1.60	<2.34	<1.74	58,400	----	----	----	----	----	----	----	----	----	----	
U4-MW-13D	10/11/2022	N	EM02	UMCf	98.2 - 108.2	<0.190	<0.160	<0.234	<0.174	55,200	----	----	----	----	----	----	----	----	----	----	
U4-MW-13D	11/3/2022	N	EM03	UMCf	98.2 - 108.2	<0.190	<0.160	<0.234	<0.174	7,010	----	----	----	----	----	----	----	----	----	----	
U4-MW-13D	12/7/2022	N	EM04	UMCf	98.2 - 108.2	<0.190	<0.160	<0.234	<0.174	2,790 J+	<3.0 R	18 J	<2.9 R	<2.7 R	<2.9 R	<2.8 R	6.6 J	<2.8 R	300 J-	<3.0 R	
U4-MW-13D	1/12/2023	N	EM05	UMCf	98.2 - 108.2	<3.80	<3.20	<4.68	<3.48	2,110 J+	----	----	----	----	----	----	----	----	----	----	
U4-MW-13I	4/14/2022	N	BL02	UMCf	77.1 - 87.1	0.291 J	<0.160	<0.234	<0.174	1,080 J+	<3.0	17 J	<2.9	240	<2.9	<2.8	21 J	<2.8	<2.6	<3.0	
U4-MW-13I	9/28/2022	N	EM01	UMCf	77.1 - 87.1	<0.190	<0.160	<0.234	<0.174	2,450 J+	----	----	----	----	----	----	----	----	----	----	
U4-MW-13I	10/10/2022	N	EM02	UMCf	77.1 - 87.1	1.49	<0.160	<0.234	<0.174	1,900 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-13I	11/3/2022	N	EM03	UMCf	77.1 - 87.1	<0.190	<0.160	<0.234	<0.174	2,000 J+	----	----	----	----	----	----	----	----	----	----	
U4-MW-13I	12/6/2022	N	EM04	UMCf	77.1 - 87.1	<0.950 UJ	<0.800 UJ	<1.17 UJ	<0.870 UJ	37,400	<1.2	68	<1.2	130 J+	<1.2	<1.1	7.3 J	<1.1	1.5 J	<1.2	
U4-MW-13I	1/12/2023	N	EM05	UMCf	77.1 - 87.1	<0.190	<0.160	<0.234	<0.174	67,800	----	----	----	----	----	----	----	----	----	----	
U4-MW-14D	4/13/2022	N	BL02	UMCf	97.3 - 107.3	0.295 J	<0.160	<0.234	<0.174	1,220 J+	----	----	----	----	----	----	----	----	----	----	
U4-MW-14D	12/6/2022	N	EM04	UMCf	97.3 - 107.3	<0.950 UJ	<0.800 UJ	<1.17 UJ	<0.870 UJ	570 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-14I	4/14/2022	N	BL02	UMCf	77.3 - 87.3	<0.190	<0.160	<0.234	<0.174	1,090 J+	----	----	----	----	----	----	----	----	----	----	
U4-MW-14I	12/6/2022	N	EM04	UMCf	77.3 - 87.3	<0.950 UJ	<0.800 UJ	<1.17 UJ	<0.870 UJ	786 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-15D	4/13/2022	N	BL02	UMCf	96.0 - 106.0	<0.190	<0.160	<0.234	<0.174	1,240 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-15D	12/5/2022	N	EM04	UMCf	96.0 - 106.0	<0.190	<0.160	<0.234	<0.174	922 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-15DD	4/13/2022	N	BL02	UMCf	120.3 - 130.3	<0.190	<0.160	<0.234	<0.174	532 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-15DD	12/5/2022	N	EM04	UMCf	120.3 - 130.3	<0.190	<0.160	<0.234	<0.174	505 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-15I	4/12/2022	N	BL02	UMCf	76.8 - 86.8	0.215 J	<0.160	<0.234	<0.174	1,440 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-15I	12/5/2022	N	EM04	UMCf	76.8 - 86.8	<0.190	<0.160	<0.234	<0.174	60,700	----	----	----	----	----	----	----	----	----	----	
U4-MW-15S	4/13/2022	N	BL02	UMCf	54.8 - 64.8	<0.190	<0.160	<0.234	<0.174	848 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-15S	12/5/2022	N	EM04	UMCf	54.8 - 64.8	<4.75	<4.00	<5.85	<4.35	499,000	----	----	----	----	----	----	----	----	----	----	
U4-MW-16D	4/11/2022	N	BL02	UMCf	96.8 - 106.8	0.534 J	<0.160	<0.234	<0.174	1,340 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-16D	12/5/2022	N	EM04	UMCf	96.8 - 106.8	0.260 J	<0.160	<0.234	<0.174	3,980 J+	----	----	----	----	----	----	----	----	----	----	
U4-MW-16DD	4/12/2022	N	BL02	UMCf	120.8 - 130.8	<0.190	<0.160	<0.234	<0.174	827 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-16DD	12/5/2022	N	EM04	UMCf	120.8 - 130.8	<0.190	<0.160	<0.234	<0.174	852 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-16I	4/11/2022	N	BL02	UMCf	77.0 - 87.0	<0.190	<0.160	<0.234	<0.174	950 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-16I	12/5/2022	N	EM04	UMCf	77.0 - 87.0	<0.190	<0.160	<0.234	<0.174	515,000	----	----	----	----	----	----	----	----	----	----	
U4-MW-16I	12/5/2022	FD	EM04	UMCf	77.0 - 87.0	<0.190	<0.160	<0.234	<0.174	515,000	----	----	----	----	----	----	----	----	----	----	
U4-MW-16S	4/12/2022	N	BL02	UMCf	54.8 - 64.8	<0.190	<0.160	<0.234	<0.174	1,070 J+	----	----	----	----	----	----	----	----	----	----	
U4-MW-16S	4/12/2022	FD	BL02	UMCf	54.8 - 64.8	<0.190	<0.160	<0.234	<0.174	931 J	----	----	----	----	----	----	----	----	----	----	
U4-MW-16S	12/6/2022	N	EM04	UMCf	54.8 - 64.8	<0.190 UJ	<0.160 UJ	<0.234 UJ	<0.174 UJ	23,300	----	----	----	----	----	----	----	----	----	----	
U4-SLMW	11/10/2022	N	EM03		-	<0.950	<0.800	<1.17	<0.870	3,660 J+	----	----	----	----	----	----	----	----	----	----	
U4-T3	10/13/2022	N	EM02		-	0.525 J	<0.160	<0.234	<0.174	114,000	----	----	----	----	----	----	----	----	----	----	
U4-T3	11/3/2022	N	EM03		-	0.746 J	<0.160	<0.234	<0.174	61,500	----	----	----	----	----	----	----	----	----	----	
U4-T3	12/6/2022	N	EM04		-	<3.80 UJ	<3.20 UJ	<4.68 UJ	<3.48 UJ	76,300	----	----	----	----	----	----	----	----	----	----	
U4-T3	1/9/2023	N	EM05		-	0.584 J	<0.160	<0.234	<0.174	17,100	----	----	----	----	----	----	----	----	----	----	

Notes:  
 FD - Field duplicate  
 E - Field instrument error.  
 J - The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.  
 J- - The result is an estimated quantity, but the result may be biased low.  
 J+ - The result is an estimated quantity, but the result may be biased high.  
 mg/L - milligrams per liter  
 µg/L - micrograms per liter  
 N - Normal field sample  
 R - The data are unusable. The sample results are rejected due to serious deficiencies in meeting QC criteria. The analyte may or may not be present in the sample.  
 UMCf- Upper Muddy Creek Formation  
 < - The analyte was analyzed for, but was not detected above the level of the reported sample quantitation limit.  
 -- Not tested.