UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
NEW ENGLAND REGION
FIVE POST OFFICE SQUARE, SUITE 100, BOSTON, MA 02109

September 15, 2020

Bruce Thompson
de maximis, inc.
200 Day Hill Road, Suite 200
Windsor, CT 06095

Re: Approval of de maximis inc. report titled *Remedial Design Work Plan – Appendix B In Situ Sequestration Predesign Investigation Work Plan* (the "ISS PDIWP"), dated September 2020.

Nuclear Metals, Inc. Superfund Site

Dear Mr. Thompson:

EPA, in consultation with the Massachusetts Department of Environmental Protection, has completed its review of the ISS PDIWP, dated September 2020. The ISS PDIWP was revised in response to EPA comments dated July 2, 2020 and August 31, 2020. The ISS PDIWP is subject to the terms and conditions specified in the Consent Decree (CD) for Remedial Design / Remedial Action (RD/RA) for the Nuclear Metals, Inc. Site, which has an effective Date of December 6, 2019.

EPA has reviewed the revisions to the ISS PDIWP and finds that they are acceptable. Therefore, EPA approves the ISS PDIWP.

If there is any conflict between the Performance Standards as stated in the Work Plan and the Performance Standards as stated in the CD and statement of work (SOW), the CD and SOW shall control.

Please do not hesitate to contact me at (617) 918-1339 or at smith.christopher@epa.gov should you have any questions in this regard.

Sincerely,

Christopher Smith
Project Manager

NUCLEAR METALS, INC. SUPERFUND SITE

CONCORD, MASSACHUSETTS

Remedial Design Work Plan - Appendix B

In Situ Sequestration
Pre-Design Investigation Work Plan

Prepared for:

de maximis, inc.

200 Day Hill Road, Suite 200
Windsor, CT 06095

Prepared by:

Geosyntec consultants

289 Great Road, Suite #202
Acton, MA 01720

September 2020

TABLE OF CONTENTS

TABLES

FIGURES

ATTACHMENTS

ACRONYMS AND ABBREVIATIONS

°C	degrees Celsius
1,1, DCA	1,1-dichloroethane
COC	contaminant of concern
DPT	direct-push technology
DU	depleted uranium
FS	feasibility study
FSP	field sampling plan
ft bgs	feet below ground surface
ft	feet/foot
ft/ft	feet per foot
GIS	geographic information system
gpm	gallons per minute
HB	Holding Basin
HPFM	heat pulse flow meter
IDW	investigation-derived waste
ISRZ	in situ reactive zone
ISS	in situ sequestration
MCL	maximum contaminant level
MCP	Massachusetts Contingency Plan
msl	mean sea level
µg/L	microgram(s) per liter
mZVI	microscale zero valent iron
µS/cm	micro Siemens per centimeter
mg/L	milligrams per liter
mV	millivolts
ng/L	nanogram(s) per liter
NTCRA	Non-Time-Critical Removal Action
NTU	Nephelometric Turbidity Units
ORP	oxidation-reduction potential
PCE	tetrachloroethene
PDI	predesign investigation
PFAS	per- and polyfluoroalkyl substances
PFOA	perfluorooctanoic acid
PFOS	perfluorooctanesulfonic acid
PRG	preliminary remediation goal

PVC	polyvinyl chloride
RA	remedial action
RAO	remedial action objective
RD	remedial design
RDWP	remedial design work plan
RG	remediation goal
RI	remedial investigation
ROD	Record of Decision
ROI	radius of injection
SMP	sodium monophosphate
SVOC	semivolatile organic compound
TCE	trichloroethene
TS	treatability study
USEPA	United States Environmental Protection Agency
VC	vinyl chloride
VISL	vapor intrusion screening limit
VOC	volatile organic compound
ZVI	zero valent iron

1. WORK PLAN OVERVIEW

The Consent Decree (CD) and the Statement of Work (SOW) provided as Appendix B to the CD describe the Remedial Design (RD)/Remedial Action (RA) activities to be performed for the Nuclear Metals, Inc. (NMI) Superfund Site (Site). The selected remedy includes in situ sequestration (ISS) in three areas of the Site: (1) in overburden soil inside the Holding Basin (HB), (2) in overburden groundwater downgradient from the HB and (3) in bedrock groundwater. In each of these areas, ISS will be used to immobilize uranium in situ. The Pre-Design Investigations (PDIs) described herein are intended to collect data necessary to design the ISS remedies. The Remedial Design Work Plan (RDWP), of which this work plan is an Appendix, provides site background and the vision for ISS being implemented at the Site.

This ISS PDI work plan describes the purpose and a detailed scope of work for each ISS PDI, as well as how the results will be integrated with other investigations being conducted to develop the data needed to inform the RD. Note that various Treatability Studies (TSs) (included as Appendix E of the RDWP) be performed to identify the product(s) and dose(s) for the ISS amendments that will be used at the Site and tested during PDIs described in this Appendix.

1.1 Summary of ISS PDIs

The table below provides a summary of the ISS PDIs and their purpose. A detailed description of each ISS PDI is provided in subsequent sections.

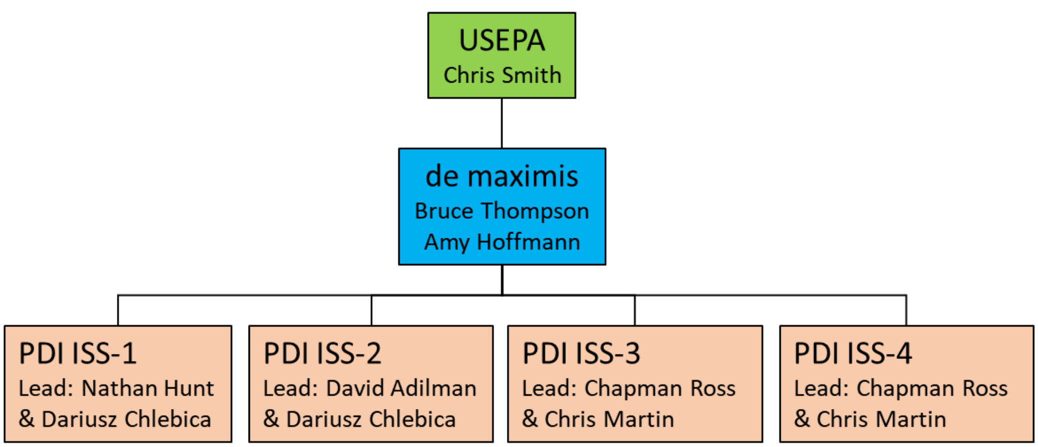
Table 1-1. Summary of Pre-Design Investigations

PDI Number and Name	Purpose and Summary
PDI ISS – 1: Site Groundwater Monitoring	Until recently, the most recent comprehensive groundwater data for the Site was from 2013. This PDI describes the comprehensive groundwater gauging and sampling that was conducted in November 2019. This monitoring program included laboratory analysis of metals, volatile organic compounds (VOCs), semivolatile organic compounds (SVOCs), nutrients (e.g., nitrate and nitrite), and per- and polyfluoroalkyl substances (PFAS) as well as collection of geochemical field parameters and water levels. The purpose of the gauging and sampling was to provide a snapshot of current (i.e., baseline) site groundwater conditions at the beginning of the RD process.
PDI ISS – 2: Pumping and Rebound Analysis for Uranium in Bedrock Groundwater	Extraction wells screened in bedrock will be installed within the uranium plume. Groundwater will be extracted from these wells to evaluate whether pumping alone can reduce isotopically natural uranium concentrations in bedrock groundwater. Pumping will be accompanied with periodic sampling of extracted groundwater to evaluate uranium concentrations over time and monitoring at nearby wells. After pumping has stopped, wells will then undergo additional sampling to assess potential rebound (if concentrations go down during pumping). The purpose of this PDI is to assess the effectiveness of groundwater extraction for removing uranium in bedrock. *If this testing results in adequate decline of uranium concentrations indicating that pumping can*

	reduce the concentrations in a reasonable time frame, then the TS and PDI for ISS in bedrock (i.e., TS ISS-3 and PDI-ISS-4) will not be performed.
PDI ISS – 3: **ISS Pilot Testing in Overburden**	Based on the results of the TSs, two reagents will be selected for overburden injectability testing outside of the HB. Injection methods will be chosen to match the selected reagents, since injection of Apatite II or zero valent iron (ZVI) slurry would likely require a different injection approach than soluble reagent injection. A field program will be implemented to evaluate the effectiveness of each injection method, including radius of injection (ROI), reagent distribution with depth, predictability of reagent distribution, injectate concentration (i.e., mass loading), and target injection volume per location. The purpose of this PDI is to inform the selection of reagent and concentration, injection location spacing, injection depth intervals, and design of a suitable monitoring program to evaluate the full-scale effectiveness in overburden groundwater.
PDI ISS – 4: **ISS Pilot Testing in Bedrock**	If required, based on results of the PDI ISS-2, pilot testing of amendment injections in bedrock will be conducted using the reagent selected from the TS ISS-3. If this testing is needed, a PDI for the work will be prepared. Such testing would have the goal of determining how many injection locations are needed in bedrock (i.e., spacing), the likely injection pressures and volumes, reagent mass loading, and the need for recirculation to distribute amendment.

1.2 ISS PDI Team

The ISS PDIs have been designed and will be performed by *de maximis* and Geosyntec. The schematic below provides the organizational chart for the PDIs described above.

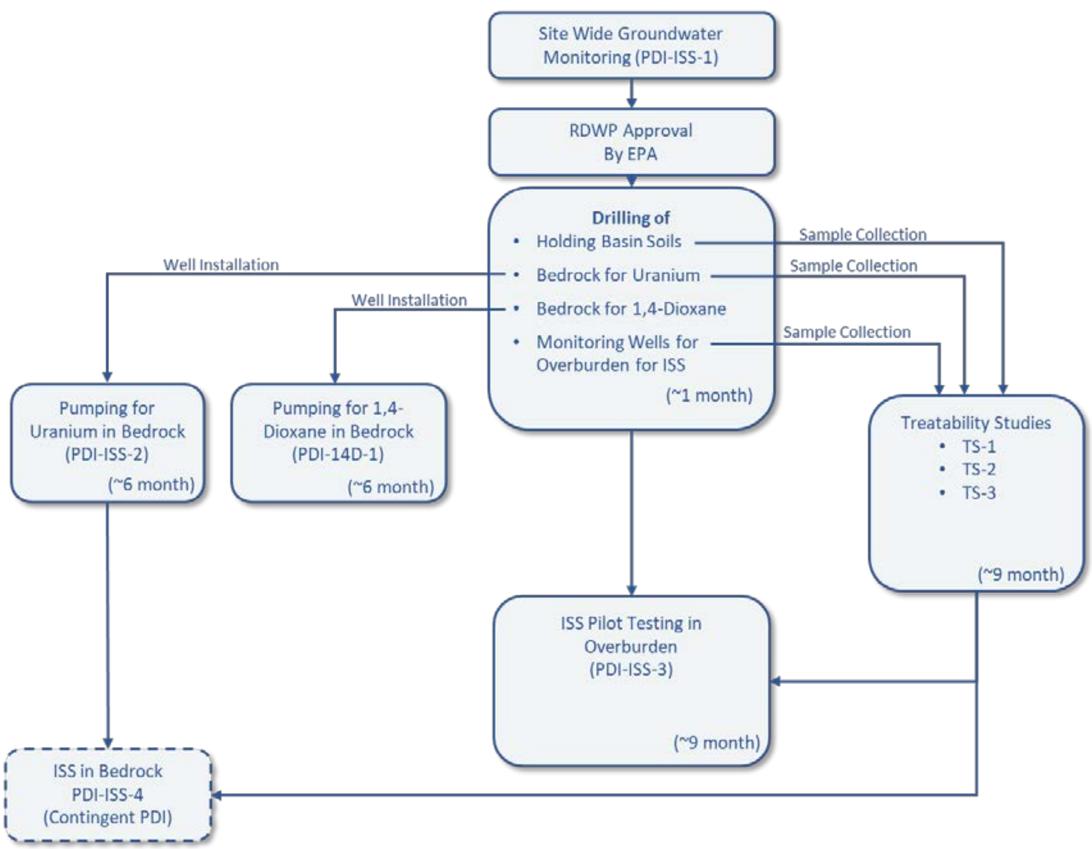


1.3 Sequencing of PDIs

Schedules for individual ISS PDIs are provided in the sections below. The overall sequence for the ISS PDIs is as follows:

- PDI ISS-1 was completed (voluntarily) in November 2019. Data from the monitoring event are summarized herein.
- PDI ISS-2 is not contingent on other PDIs or TSs so it can commence upon approval of the work plan. However, the final schedule for installation of wells for this ISS PDI will be coordinated to coincide with other drilling at the Site. Also, the management of groundwater produced during this ISS PDI will dictate that the work be conducted during non-freezing seasons of the year.
- PDI ISS-3 will be conducted in two phases. In the initial phase, monitoring wells for this PDI will be installed to facilitate collection of soil for TSs described in Appendix E. The second phase, which will be conducted after completion of the TSs, will include the delivery of chosen amendments in situ and subsequent monitoring.
- PDI ISS-4 will only be completed if deemed necessary pending results from PDI ISS-2. As noted above, if groundwater extraction proves to be an ineffective remedy for uranium in bedrock, then a scope of work for PDI ISS-4 will be developed for subsequent approval. This scope of work would be prepared after the TSs are complete since the bench-top work will determine which amendment(s) is suitable for bedrock.

The flowchart below provides a review of how the ISS PDIs will be sequenced, as well as how PDIs described herein will be sequenced with TSs (described in Appendix E) and PDIs for VOCs and 1,4-dioxane in groundwater (described in Appendix D).



1.4 Data Quality

To meet the objectives of each PDI described in the subsections below, data of sufficient quality must be collected throughout execution of the work. To achieve this, standard field procedures and laboratory analyses (along with Certified laboratories) provided in the Field Sampling Plan (FSP, Appendix I) and the Quality Assurance Project Plan (QAPP, Appendix J) will be used. Using standardized approaches for execution of the work and collection and analysis of laboratory samples throughout execution of the work described below will ensure data collected can achieve the objectives of the PDIs. The table below summarizes the Standard Operating Procedures (SOPs) applicable to each of the PDIs described in subsequent sections of this work plan. These SOPs are referenced within each detailed description of work so that applicable standard procedures are clear to field personnel performing the work.

No.	Task	ISS-1	ISS-2	ISS-3
	Soil			
NMI-S-004	Drilling	-	x	x
NMI-S-006	Soil Description	-	x	x
	Groundwater			
NMI-GW-002	Monitoring Well Development	-	x	x
NMI-GW-003	Monitoring Well Installation	-	x	x
NMI-GW-009	Water-Level Measurement Procedures	x	x	x
NMI-GW-010	Low-Flow Groundwater Purging and Sampling Procedures for Monitoring Wells	x	x	x
NMI-GW-011	Groundwater Sampling for PFAS	x	x	-
NMI-GW-014	BarCad Well Sampling	x	x	-
NMI-GW-015	Assabet Municipal Well Sampling	x	-	-
NMI-GW-016	Packer Testing Procedures	-	x	
NMI-GW-017	Specific Capacity Testing and Data Reduction	-	x	
NMI-GW-018	Pump Testing	-	x	
NMI-GW-020	Fluorescent Tracer Dye Analysis	-	-	x
	Other			
NMI-001	Chain of Custody, Handling, Packing, and Shipping	x	x	x
NMI-002	Calibration of Field Instruments - Submersible pump	x	x	x
NMI-003	Calibration of Field Instruments - ORP, NTU, DO meters	x	x	x
NMI-005	Investigation-Derived Waste Handling and Storage	x	x	x
NMI-007	Field and Heavy Equipment Decontamination	x	x	x
NMI-008	Field Activity Forms	X	X	X
NMI-009	General Survey Procedures		x	x

2. PDI ISS-1: SITEWIDE GROUNDWATER MONITORING

2.1 Introduction and Objective

Comprehensive groundwater sampling was conducted in November 2019 at the Nuclear Metals Inc. (NMI) Superfund Site (Site; Figure 2-1 and 2-2) to provide current contaminant concentration and hydraulic head data prior to developing the predesign investigation (PDI) work plans for the remedial design (RD). The objective of this PDI is to (1) document November 2019 groundwater monitoring activities, (2) present the results from the event, and (3) describe the current distribution of contaminants and hydraulic data. The results presented here are intended to inform and are integrated into other PDIs presented in this remedial design work plan (RDWP). In addition, results are compared to contaminant distributions observed during the last sitewide monitoring results from August 2013 as presented the Remedial Investigation Report (RI) (de maximis, 2014).

2.1.1 Purpose

The data collected as part of the November 2019 groundwater monitoring event and presented in this work plan includes the following:

- Overburden and bedrock groundwater elevations used to infer potentiometric contours and evaluate the hydraulic gradients across the site
- Water quality data to establish the baseline concentration and distribution of contaminants of concern (COC) across the Site
- Water quality data for analytes that currently have lower laboratory reporting limits compared to historical sampling events to supplement the existing historical dataset

The sample plan for the November 2019 event is presented in Table 2-1 and sampling locations are shown on Figure 2-3. The specific methods used to collect the data are outlined in the respective sections below.

2.2 Monitoring Activities

The section below describes the groundwater monitoring and sampling activities conducted in November 2019.

2.2.1 Depth to Water Measurements

On November 10, 2019, *de maximis inc*. (*de maximis*) measured depth to water at monitoring wells across the Site, including wells on the 46-acre NMI Site Property and downgradient properties where impacted groundwater has migrated (downgradient properties). A Site plan showing the locations of existing monitoring wells is presented on Figure 2-3. Depth to water was measured at 126 overburden and bedrock monitoring wells using procedures outlined in SOP NMI-GW-009 (see FSP). Depth to water measurement data and the estimated groundwater elevations are presented in Table 2-2. The groundwater elevation contours inferred from the November 2019 data are presented on Figures 2-4a for overburden and 2-4b for bedrock. Hydraulic gradient analysis based on these contours is presented in Section 2.3.1 for overburden and 2.3.2 for bedrock.

2.2.2 Groundwater Sampling

Between November 11 and 19, 2019, *de maximis,* in coordination with O&M, Inc. (O&M) and Geosyntec, collected samples from 123 wells located on the NMI Property and the downgradient areas. The total wells sampled includes 115 standard monitoring wells, extraction well EW-1, municipal wells Assabet 1A and 2A operated by the Town of Acton Water District, and 5 BarCad® sampling systems installed in wells GZW-7-2, GZW-8-2, ML-1-2, ML-1-3, and ML-3-3.

The samples for total uranium (U), U^{235}, U^{238}, and thorium $(Th)^{232}$ and metals by Method 6020A ICP-MS (Inductively Coupled Plasma - Mass Spectrometry) were submitted to GEL Laboratories in Charleston, South Carolina. Samples collected for all other analytes were submitted to Alpha Analytical Inc. of Westborough, Massachusetts. The following primary analyses were conducted at all sampling locations as indicated on the sample plan (Table 2-1).

- Volatile organic compounds (VOCs) by Method 8260
- 1,4-dioxane by method 8270D SIM (Selected Ion Monitoring)
- Semivolatile organic compounds (SVOCs) by Method 8270D
- Total uranium(U), U^{235}, U^{238}, and Th^{232} by Method 6020A ICP-MS
- Total and dissolved metals by Method 6020A ICP-MS
- Nitrate/nitrite by Method 353.2

A subset of the monitoring wells was also sampled for one or more of the following compounds as indicated by the sampling plan (Table 2-1).

- Per- and poly-fluoroalkyl substances (PFAS) by Method 537 1.1 I.D
- Total phosphorous by Method 365.1
- Orthophosphate by Method SMP4500P-E
- Dissolved organic carbon by Method 9060
- Anions ($SO4^{2-}$, F^{-}, Cl^{-}) by Method 300
- Alkalinity (carbonate/bicarbonate) by Method 310.1

Following meter calibration per SOP NMI-002 and NMI-003, standard monitoring wells were purged with submersible bladder pumps per SOP NMI-002 and sampled in accordance with the United States Environmental Protection Agency (USEPA) low-flow sampling protocols as described in SOP NMI-GW-010 or SOP NMI-GW-011. BarCad sampling systems were purged and sampled using procedures outlined in SOP NMI-GW-014. Table 2-2b presents the field geochemical parameters observed at the time of sample collection. Samples were stored on ice in a cooler and shipped under Chain or Custody procedures (SOP NMI-001) to the environmental laboratory for analysis per the laboratory protocols described in the QAPP. Equipment was decontaminated between sampling locations per SOP NMI-007.

Water samples from the Town of Acton municipal supply wells (Assabet 1A and Assabet 2A) located in the Assabet wellfield were collected from the faucets connected to subsurface lines that carry untreated (raw) water to the Acton Water District treatment plant using procedures outlined SOP NMI-GW-015.

2.3 Hydraulic Gradient Results

Groundwater potentiometric contours inferred from the depth-to-water measurements in overburden and bedrock are shown on Figures 2-4a and 2-4b, respectively. The potentiometric contours are used to infer hydraulic gradients in overburden and bedrock.

2.3.1 Overburden

Interpretations of results from November 2019 groundwater elevations show that hydraulic gradients at the Site are similar to the results in the RI (*de maximis*, 2014). Horizontal gradients near the HB are northwestward, ranging from 0.013 feet per foot (ft/ft) immediately downgradient of the HB (HB-PZ-2R to MW-8A), to 0.008 ft/ft north of Building D, to 0.015 ft/ft near Route 62 (MW-S27 to P-4) and 0.042 ft/ft in the vicinity of the Assabet River (Figure 2-4a). Areas to the west of the HB from approximately MW-S04 to the GZW-10 area also show a northward horizontal gradient, although the gradient is much steeper at approximately 0.06 ft/ft. The high groundwater elevations in overburden and resulting steep hydraulic gradients in this area are attributed to a silt unit with hydraulic conductivities ranging from 0.4 ft/day at MW-S08 and MW-S23 and 1.5 ft/day at MW-S04 which are low relative to the rest of the overburden at the NMI property. This unit was identified and discussed in the Remedial Investigation report. Gradients from GZW-10 northward across Route 62 near the 2284 Main Street property become much flatter at 0.005 ft/ft, but the direction is still generally northward (Figure 2-4a).

Near the Assabet River, the gradients are oriented more westward because they are influenced by the pumping at extraction well EW-1 (installed in 2016 as part of the Non-Time Critical Removal Action (NTCRA)) and Acton municipal wells Assabet 1A and 2A. In the Assabet wellfield west of the river, the gradients reflect an EW-1 stagnation zone located to the east of wells MW-SD42A and MW-SD44. The estimated EW-1 capture zone at 20 gallons per minute (gpm) is presented on Figure 2-4a.

Vertical gradients in overburden, as measured in several overburden well pairs across the Site, were evaluated. Generally, November 2019 vertical gradients indicate upward groundwater flow in the overburden in the central portion of the Site (e.g., MW-S02/SD02 and MW-S17/SD17), and downward gradients in the plateau area on the northwest portion of the Site (e.g., MW-S01/SD01, MW-S13/ SD13, and MW-S29/SD29).

Near the Assabet River, the well pairs show an upward gradient from the deeper overburden at P-1A (25-30 ft bgs) to the water table well at GZW-8-1, MW-SD32 to MW-S32, MW-SD35 to MW-S35, and MW-SD36 to MW-S36. West of the river, in the Assabet wellfield the gradients are downward from shallow overburden to deep overburden at well pairs (MW-S37/SD37, MW-S39/SD39, and MW-S40/SD40) which is attributable to active pumping at municipal supply wells and EW-1 which are all screened in deep overburden.

2.3.2 Bedrock

Bedrock groundwater flow directions and gradients inferred from the November 2019 data are similar to those observed at the Site historically and indicate a fairly uniform northwest gradient from upgradient of the former buildings, toward the Skating Rink and Assabet River.

The horizontal gradients in the bedrock aquifer calculated by linear interpolation between contours on Figure 2-4b range from an average 0.017 ft/ft in the HB area to 0.0048 ft/ft in the northwest portion of the Site (GZW-10 to MW-BS28 area). The gradients become flatter in the downgradient portion of the Site to 0.002 ft/ft in the MW-BS31 to MW-BS34 area (Figure 2-4b). The bedrock gradients near the Assabet River appear to be influenced by pumping at EW-1 which is screened at the base of overburden and approximately 1-ft into bedrock, and the Acton municipal wells Assabet 1A and 2A.

Vertical gradients observed during the November 2019 water level round indicated upward vertical gradients from deeper rock to shallow rock (e.g., there is a 3-foot difference in head between BM15 and BS15). The heads in the bedrock versus overburden indicate a downward gradient from overburden to bedrock on the western portion of the NMI Property (MW-S03/BS03, MW-S04/BS04, and GZW-10-1/10-2) with upward gradients from bedrock to overburden in the central and northern portion of the property (MW-BS32 at 125.25 ft to MW-SD32 at 125.11 ft, MW-BS34 at 125.39 ft to MW-SD34 at 125.10 ft, and MW-BS35 at 127.88 ft to MW-SD35 at 127.40 ft [see Table 2-2a]). .

2.4 Sampling Results

November 2019 sampling results are discussed in context of the historical datasets generated during the Groundwater NTCRA and the RI/FS. The discussion of results is supplemented with figures depicting the current distribution of contaminants that are the focus of current PDIs. Additional figures, depicting the exceedance ratios (i.e., concentrations relative to a standard) for selected compounds that have historically been detected above the Maximum Contaminant Level (MCL), Site-specific Risk-based Cleanup Levels or Remediation Goals (RGs), or are of particular interest to the stakeholders are presented in Attachment A to this appendix.

2.4.1 Uranium

Uranium is a naturally occurring metal comprised of three radionuclides U^{234}, U^{235}, and U^{238}. If uranium is processed as part of the uranium fuel cycle, the ratios of these isotopes will change and is typically identified as enriched (increased concentrations of U^{234} and U^{235}) or depleted (decreased concentrations of U^{234} and U^{235}), relative to the total uranium in the sample. If the ratio of U^{235} to U^{238} is greater than 0.6 percent (%), it indicates natural uranium, while ratios of U^{235} to U^{238} closer to 0.2% indicate depleted uranium (DU). Studies of uranium in groundwater presented in the RI (*de maximis*, 2014) indicated that the majority of overburden groundwater samples with detections of uranium at concentrations greater than background exhibited a *DU isotopic signature*, and the majority of bedrock groundwater samples with detections of uranium greater than background exhibited a *natural isotopic* signature. The isotopic ratios in samples collected in November 2019 corroborated the historical isotopic speciation.

2.4.1.1 *Depleted Uranium in Overburden Groundwater*

The primary source of uranium to overburden groundwater at the Site is historical disposal of source material in the HB. In overburden groundwater, uranium has migrated away from the HB in the direction of groundwater flow to the northwest. In the vicinity of the HB, uranium impacts in overburden groundwater extend from the water table into the till, with the highest concentrations in the immediate vicinity of monitoring well MW-S24 (2,675 micrograms per liter [µg/L]) located in the shallow overburden (Figure 2-5). Results from the November 2019 sampling event for total uranium ranged from 0.0677 (MW-S30) to 2,675 µg/L (MW-S24) (Table 2-3). In the downgradient portion of the overburden uranium plume, impacts are generally confined to the shallower groundwater zones in the stratified drift, as shown in the cross section on Figure 2-6. The extent of the overburden groundwater plume containing uranium at concentrations exceeding the MCL of 30 µg/L is limited to an area between the HB and the footprint of the former Building D. At MW-S02, located immediately downgradient of former Building D, uranium has historically been detected at concentrations in excess of the MCL (30.9 µg/L in 2005, 31.6 µg/L in 2009, and 53 µg/L in 2013), but concentrations have decreased significantly in recent years to 4.24 µg/L in November 2019.

The November 2019 detections of uranium are generally slightly lower than the historical results presented in the RI report, the Feasibility Study (*de maximis, 2014*), and several groundwater NTCRA reports (Geosyntec 2015; 2016; 2017a; 2017b). The distribution of uranium in overburden groundwater is consistent with that outlined in the RI report indicating that the plume has been stable and continues to be limited to an area immediately downgradient of the HB.

2.4.1.2 *Isotopically Natural Uranium in Bedrock Groundwater*

The uranium distribution in bedrock groundwater and the isoconcentration contours inferred from data collected in November 2019 are depicted on Figure 2-7a. Historical uranium detections in bedrock wells are presented on Figure 2-7b. The zone of elevated uranium extends northwest from the area of the HB (GZW-7-2) to just upgradient of the northwest corner of the Site (MW-BS28). During the November 2019 sampling round, the highest concentrations of uranium were detected as follows:

- To the northwest MW-BS13 (65.3 µg/L) and GZW-10-2 (71.1 µg/L).
- Beneath the former buildings at MW-BM03 (45.3 µg/L), MW-BS03 (69.6 µg/L)
- In the central portion of the NMI Property near the HB at GZW-7-2 (47.2 µg/L)

The concentrations dissipate to levels below the MCL (30 µg/L) within the property limits. The uranium concentrations detected in wells located along the southern portion of the plume are below 10 µg/L with only one well MS-BS10 (31.5 µg/L) exceeding the MCL. Downgradient of the Site, uranium was detected at well MW-BS15 at concentrations below the MCL (5.9 µg/L). The complete analytical results for uranium in bedrock groundwater are included in Table 2-3.

Although the November 2019 distribution of uranium in bedrock groundwater is similar to that presented in the RI report, the concentrations within the core of the plume (e.g., wells MW-BS02 and MW-BS03) have decreased by more than 50% to approximately 70 µg/L from the approximately 150 µg/L observed in 2013. As documented in the RI Report, it was hypothesized that solubilization of uranium bearing minerals in bedrock occurred as a result of altered bedrock groundwater geochemistry caused by historic chemical releases into the Holding Basin. Recent decrease in U concentrations in bedrock may be due to removal of historical mechanisms that mobilized bedrock uranium (i.e. natural uranium in bedrock is no longer being released) coupled with dilution by non-impacted groundwater from upgradient areas.

2.4.2 1,4-dioxane and Semivolatile Organic Compounds

This section describes the November 2019 analytical results for 1,4-dioxane and other SVOCs. Since 2015, 1,4-dioxane has been the primary focus of groundwater investigations and remedial activities completed under the Groundwater NTCRA due the impact to the Assabet wellfield; thus, there has been substantial sampling for 1,4-dioxane in the NTCRA area. However, the November 2019 sampling round provides the first sitewide 1,4-dioxane data set collected on the NMI Property since 2013. The distribution in overburden and bedrock groundwater are discussed in detail below and presented on Figure 2-7a/b, 2-8 and 2-9.

Although other SVOCs have not been historically detected in the Site groundwater at elevated concentrations, the November 2019 comprehensive sampling event was intended to supplement the current understanding of the SVOC distribution in groundwater at the initiation of RD activities. A full summary of the SVOC results is presented in Table 2-4.

2.4.2.1 *1,4-dioxane in Overburden Groundwater*

The area with 1,4-dioxane impacts in overburden groundwater exceeding the 2015 Record of Decision (ROD) cleanup level (0.46 µg/L) generally extends from the HB and MW-SD10 to the northwest, across the NMI Property, toward and beneath the Assabet River into the Assabet wellfield (Figure 2-8). The highest concentration of 1,4-dioxane in overburden on the NMI Property was detected in deep overburden well MW-T24 (29.1 µg/L) near the HB. Concentrations of 1,4-dioxane decrease across the NMI Property to below 10 µg/L at monitoring wells MW-S01 (9.08 µg/L) and MW-1 (9.29 µg/L) located near the northern edge of the Property.

In the downgradient portion of the plume, the highest 1,4-dioxane concentration in overburden detected in the November 2019 monitoring event was at well MW-SD34 (27.3 µg/L) located in deep overburden north of the Skating Rink. It is hypothesized that a portion of the 1,4-dioxane mass in deep overburden is attributed to inferred discharge from the bedrock plume (described in the next section). Concentrations of 1,4-dioxane in overburden decrease substantially from MW-SD34 in all directions, including the Assabet wellfield where the concentrations west of the Assabet River have dissipated following the initiation of the hydraulic containment system at EW-1 in June 2016. In this area, the maximum detections of 1,4-dioxane were at extraction well EW-1 (3.92 µg/L) and monitoring well MW-SD37 (3.04 µg/L). These data support the efficacy of the NTCRA hydraulic capture remedy for 1,4-dioxane impacts in the overburden west of the Assabet River.

The 1,4-dioxane distribution in groundwater based on November 2019 data is generally similar to the distribution observed during the RI (*de maximis,* 2014), but the concentrations have decreased slightly on the NMI Property and downgradient areas. Monitoring wells installed as part of the

NTCRA between 2015 and 2017 provide better resolution in the downgradient portion of the plume and the Assabet Wellfield, than was previously available during the RI.

2.4.2.2 *1,4-dioxane in Bedrock Groundwater*

The 1,4-dioxane distribution in bedrock groundwater and the general extent of the plume exceeding the ROD cleanup level (0.46 µg/L) as inferred from data collected in November 2019 is depicted on Figures 2-7, 2-8, and 2-9. The plume extends from the HB area, below the main facility, to MW-BS32 near the Assabet River.

The highest 1,4-dioxane concentrations on the NMI Property were detected at bedrock wells GZW-10-2 (55.4 µg/L) and MW-BS13 (99.1 µg/L) located to the northwest of former Building A. The concentrations decrease to the south and north of this area. In shallow bedrock well GZW-7-2 located immediately downgradient of the HB, the 1,4-dioxane concentration detected in November 2019 (34.7 µg/L) is similar to the historical detections at this well.

In the downgradient portion of the 1,4-dioxane plume, the highest concentration was detected at MW-BS15 (73.4 µg/L), consistent with historical results. From the MW-BS15 area, 1,4-dioxane concentrations in bedrock decrease approaching the Assabet River to the north of the Skating Rink as demonstrated by results from wells MW-BS32 (36.4 µg/L) and MW-BS34 (0.598 µg/L). It is inferred that groundwater containing 1,4-dioxane discharges from bedrock to deep overburden in this area as demonstrated by persistent elevated detections of 1,4-dioxane in the deep overburden well MW-SD34 (see Figure 2-8).

The bedrock 1,4-dioxane plume has historically extended beneath the river and into areas immediately east of the Assabet wellfield. Similar to the overburden, the 1,4-dioxane concentrations in bedrock have decreased following the startup of EW-1 in June 2016. During the November 2019 sampling, 1,4-dioxane was not detected in samples collected from bedrock monitoring wells located west of the Assabet River.

The distribution of 1,4-dioxane in bedrock is similar to that presented during the RI in portions of the plume where historical data existed; however, the concentrations are generally higher compared to those reported in the RI. Higher concentrations may be attributable to improved analytical method (Method 8270-SIM) which was not available during the RI, and a greater distribution of monitoring wells.

2.4.2.3 *Semivolatile Organic Compounds*

During the November 2019 sampling, SVOCs were not detected above their respective MCLs in bedrock groundwater. Bis(2-ethylhexyl) phthalate was detected in overburden groundwater at monitoring well MW-S38 (located within the Assabet wellfield) at a concentration of 7.8 µg/L. This concentration exceeds the MCL 6 µg/L. No SVOCs exceeded their respective MCLs in samples collected from monitoring wells located on the NMI Property.

2.4.3 Volatile Organic Compounds

During the November 2019 sampling, samples collected from all wells were analyzed for VOCs. Several VOCs were detected above the laboratory reporting limit. Consistent with historical data, only tetrachloroethene (PCE), trichloroethene (TCE), 1,1-dichloroethane (1,1-DCA), and vinyl chloride (VC) were detected above their respective MCL and ROD cleanup levels. A summary of the VOC results is presented in Table 2-5.

2.4.3.1 *Overburden Groundwater*

VOC detections in overburden groundwater were compared to the MCL. Shallow overburden groundwater results were additionally compared to site-specific vapor intrusion screening limits (VISLs). Shallow overburden monitoring wells are identified in the VOC results summary (Table 2-5). The distribution of COCs is described below.

- PCE was detected at concentrations above the MCL (5 µg/L) and VISL (5.76 µg/L) at four overburden monitoring wells on the NMI Property. The highest concentrations were at HB-10 (25 µg/L) and HB-10S (42 µg/L) located near the HB. Additional exceedances were at wells HB-11 (7.7 µg/L) and MW-S17 (6.8 µg/L) located downgradient and to the north of the HB. PCE was detected in several wells downgradient of the NMI Property at concentrations below the MCL and VISL.
- TCE exceeded the MCL (5 µg/L) at HB-10S (10 µg/L) near the HB. Detections of TCE below the MCL extend downgradient and to the northeast of the HB, including monitoring wells MW-T24 (4.6 µg/L), MW-S01 (3.1 µg/L), MW-1 (4.9 µg/L; detected in the duplicate sample). Downgradient of the NMI Property, the highest concentrations (although below the MCL) were detected at MW-S32 (4.9 µg/L), MW-SD34 (3.8 µg/L), and MW-SD37 (4.3 µg/L). Seven shallow overburden groundwater samples on the NMI Property and downgradient properties had detections of TCE above the VISL (0.518 µg/L), but below the MCL. These detections were primarily in the area of the Assabet wellfield and north of the Skating Rink.
- 1,1-DCA was detected above the laboratory reporting limit at several overburden monitoring wells with the highest concentration detected at MW-S01 (2.4 µg/L) located northwest of the former Building A. Although no overburden groundwater cleanup level was established for 1,1-DCA in the 2015 ROD, the MW-S01 detection was lower than the bedrock groundwater cleanup level (2.7 µg/L) and VISL (7.64 µg/L).
- VC was not detected above the MCL (2 µg/L) during the November 2019 sampling and was only detected above the VISL (0.147 µg/L) at shallow overburden well MW-S20 (0.46 µg/L), near the southeast corner of the NMI Property. The detection at MW-S20 is considered an estimate (J-qualifier) because the concentration is below the laboratory reporting limit (1 µg/L), but above the method detection limit.

2.4.3.2 *Bedrock Groundwater*

VOC detections in bedrock were compared to the MCL and the distribution of COCs is described below.

- PCE, TCE (MCL 5 µg/L), and VC (MCL 2 µg/L) were not detected above the MCL in bedrock groundwater during the November 2019 sampling round. Low-level detections of these compounds follow a similar southeast to northwest plume as 1,4-dioxane and 1,1-DCA.

- 1,1-DCA was detected above the ROD cleanup level (2.7 µg/L) in four bedrock monitoring wells near the northeastern edge of the NMI Property—GZW-10-2, MW-BS01, MW-BS13, and MW-BS25. The highest detection of 1,1-DCA in bedrock groundwater was at MW-BS01 (9.3 µg/L). Downgradient of the NMI Property, 1,1-DCA was not detected above the laboratory reporting limit except at MW-BS15 (2.2 µg/L).

The VOC exceedances in overburden and bedrock groundwater are limited to locations within the footprint of the 1,4-dioxane and uranium plumes. The VOCs in these areas are expected to be treated as part of the remedial activities targeting 1,4-dioxane and uranium.

2.4.4 Per- and Polyfluoroalkyl Substances

Groundwater samples for analysis of per-and polyfluoroalkyl compounds (collectively known as PFAS) were collected from a subset of 19 monitoring wells across the NMI Property, the downgradient areas, and the Assabet Wellfield. The November 2019 sampling represents the first time Site groundwater samples were analyzed for PFAS. Although no specific concern existed for the presence of PFAS based on historical Site operations, the sampling was conducted voluntarily due to the heightened regulatory and public awareness of these compounds in the environment. A full summary of the PFAS results, including 36 individual PFAS compounds, is presented in Table 2-6.

2.4.4.1 *Overburden Groundwater*

PFAS were detected in samples collected from 11 overburden monitoring wells at the Site including 2 background wells, and from the municipal supply wells Assabet 1A and 2A (one from each well and a combined flow). Perfluorooctanoic acid (PFOA) results ranged from 0.237 nanograms per liter (ng/L) at well MW-S21 to 7.2 ng/L at well MW-S06. Perfluorooctanesulfonic acid (PFOS) results ranged from non-detect at wells MW-S12 and MW-S21 to 15.1 ng/L at MW-S06, and Massachusetts Contingency Plan (MCP) 6 total PFAS results ranged from 0.237 ng/L at MW-S21 to 25.9 ng/L at MW-S06.

One overburden groundwater sample, MW-S06 (25.9 ng/L) exceeded the MCP 6 total PFAS limit (20 ng/L), but not the USEPA individual PFOA/PFOS screening limit (40 ng/L) or total PFOA/PFOS preliminary remediation goal (PRG; 70 ng/L). MW-S06 is located on the NMI Property immediately northeast of the former buildings.

Additionally, samples from municipal supply well Assabet 1A and the combined flow of both Assabet pumping wells exceeded the MCP 6 total PFAS limit, but not the USEPA screening limit or PRG.

2.4.4.2 *Bedrock Groundwater*

PFAS were detected in the eight samples collected from bedrock monitoring wells, including two background monitoring wells. PFOA results ranged from 4.32 ng/L at MW-BM03 to 209 ng/L at GZW-7-2. PFOS detections ranged from 0.59 ng/L at MW-BS34 to 6.71 ng/L at MW-BS15, and MCP 6 total PFAS results ranged from 0.302 ng/L at MW-BM15 to 212 ng/L at GZW-7-2.

The highest concentrations of PFAS on the NMI Property were detected in well GZW-7-2 where the constituents exceeded the MCP 6 total PFAS limit (20 ng/L), USEPA individual PFOA/PFOS screening limit (40 ng/L), and total PFOA/PFOS PRG (70 ng/L). GZW-7-2 is a BarCad well located immediately downgradient of the HB. The isolated high detections of PFAS/PFOA at this well and uniquely high PFOA concentrations relative to other PFAS, is believed to be attributable to materials used in the construction of the a BarCad sampler. A 2-inch PVC replacement well, MW-BS7-2, will be installed in the immediate vicinity of GZW-7-2 as part of PDIs to provide a replacement monitoring location that does not use a BarCad sampling system. The installation of this well is described in Section 3 (ISS PDI-2). The samples collected from the replacement well will help in evaluating whether the PFAS concentrations observed at GZW-7-2 represent impacts from the BarCad sampling system.

2.4.5 Other Parameters

Additional parameters analyzed for in bedrock and overburden groundwater during the November 2019 sampling event include metals (except uranium which is discussed in Section 2.4.1), nitrate/nitrite, geochemical parameters (chloride, fluoride, sulfate, alkalinity, carbonate, and phosphorus) and field parameters. The results of these parameters are provided in Tables 2-3, 2-7 and 2-8, and discussed in the following sections.

2.4.5.1 *Other Metals*

The metals detected in groundwater above the MCL during the November 2019 sampling event include arsenic, cobalt, iron, manganese, molybdenum, and thorium.

- Arsenic
    - Overburden: Arsenic was detected in four overburden wells at concentrations exceeding the MCL (10 µg/L). The exceedances ranged from 12 µg/L at MW-SD44 to 17.7 µg/L at HB-10S.
    - Bedrock: Arsenic was detected above the MCL (10 µg/L) in eight bedrock monitoring wells at concentrations ranging from 12.9 µg/L at MW-BS36 to 608 µg/L at MW-BM03 located on the NMI Property southwest of the former Building A. A continuous plume is not apparent in bedrock; however, an elevated concentration of arsenic is present at MW-BS34 (139 µg/L), north of the Skating Rink and near the Assabet River. Arsenic was also detected above the MCL in the bedrock groundwater at background monitoring well MW-BS12 (54 µg/L) located to the south of the NMI Property.
    - There is no known Site-related source of arsenic; elevated concentrations of arsenic may be related to the same geochemical conditions that led to solubilization of geogenic uranium in bedrock.
- Cobalt
    - Overburden: Cobalt was detected above the MCL (6 µg/L) at 12 overburden monitoring wells at concentrations ranging from 7.85 µg/L at HB-10 to 40.5 µg/L at MW-SM13. MCL exceedances of cobalt on the NMI Property are primarily

located near the HB or immediately northwest of the former Building D. Although cobalt exceeded the MCL at only two downgradient wells, MW-S15 (12.1 µg/L) and MW-S26 (11.9 µg/L), additional exceedances were reported for three wells located in the Assabet Wellfield, including MW-S36 (16.8 µg/L), MW-S38 (15.9 µg/L), and MW-SD39 (9.38 µg/L).

  - Bedrock: Cobalt exceeded the MCL in bedrock monitoring wells MW-BM03 (7.18 µg/L) and MW-BS15 (17.4 µg/L). These wells correspond to the locations of elevated uranium and 1,4-dioxane concentrations that are being targeted as part of PDI ISS-2.

- Iron
  - Overburden: Iron exceeded the MCL (14,000 µg/L) in 4 overburden monitoring wells at concentrations ranging from 14,900 µg/L at HB-10S to 33,200 µg/L at MW-SD36 located in the Assabet Wellfield.
  - Bedrock: The only exceedance of the iron MCL in bedrock groundwater was reported in a sample collected from well MW-BS04 (14,600 µg/L) located in the southwestern portion of the NMI Property.

- Manganese
  - Overburden: Manganese exceeded the MCL (300 µg/L) in 23 monitoring wells, municipal well Assabet 1A, and EW-1 at concentrations ranging from 311 µg/L at MW-SD38 to 16,200 µg/L at MW-S40, with a next highest concentration of 3,830 µg/L at MW-S38. Detections of manganese in groundwater are spread across the NMI Property as well as the downgradient properties.
  - Bedrock: The manganese concentrations detected at 12 bedrock wells exceeded the MCL. The exceedances ranged from 344 µg/L at MW-BS10 to 1,270 µg/L at MW-BS31.

- Molybdenum
  - Overburden: Molybdenum was detected above the MCL (100 µg/L) in 2 overburden monitoring wells near the HB area on the NMI property at concentrations of 211 µg/L at HBPZ-2R and 373 µg/L at MW-S24.
  - Bedrock: Molybdenum was not detected above the MCL in bedrock groundwater.

- Thorium
  - Overburden: Thorium was detected above the MCL (0.33 µg/L) in groundwater samples collected from 8 overburden monitoring wells at concentrations ranging from 0.74 µg/L at MW-S22 to 1.53 µg/L at MW-S28. All thorium detections are flagged with the J-qualifier as estimates because they are below the laboratory reporting limit, but above the limit of detection.
  - Bedrock: Thorium exceeded the MCL in 5 bedrock wells, with the exceedances ranging from 0.775 µg/L at MW-BS35 to 5.3 µg/L in BarCad sampler installed at

ML-1-3. Of the 5 exceedances, 4 values were flagged as estimated (J-qualifier) due to the limits of detections lower than the laboratory reporting limit.

The highest concentrations of metals detected in bedrock groundwater generally fall within the footprint of the bedrock uranium, and 1,4-dioxane plumes will be evaluated as part of the pumping activities outlined in PDI ISS-2.

2.4.5.2 *Nitrate and Nitrite*

The nitrate and nitrite results for wells sampled in November 2019 are presented in Table 2-7. A brief discussion of the results and comparison to the historical data summarized in the RI is presented below.

Overburden Groundwater

Historically, nitrate was widespread in overburden groundwater at concentrations of up to nearly 2,000 milligrams per liter (mg/L) beneath the HB, as high as 890 mg/L at P-1 north of Route 62, and from 10 to 100 mg/L at other locations in the interior of the Site. The November 2019 results indicate that nitrate has dissipated in overburden groundwater to concentrations below the MCL (10 mg/L) except for monitoring well MW-T24 (150 mg/L), located just outside of the HB. Nitrite was not detected above the MCL (1 mg/L) in monitoring wells sampled during the November 2019 sampling round.

Bedrock Groundwater

Historically, nitrate has been detected at concentrations over 1,000 mg/L in bedrock near the HB (GZW-7-2 in 1992), in downgradient bedrock at 11 mg/L (GZW-8-2 in 1992), and in the bedrock supply well at 53 mg/L (SW-2A in 1984). Downgradient of the southwestern septic leach field (ST-1) bedrock groundwater contained as much as 238 mg/L nitrate (GZW-6-3 in 1992). The highest nitrate concentration in the recent, November 2019 sampling was detected at bedrock monitoring well GZW-7-2 (63 mg/L). Well GZW-7-2 was also the only location where the nitrite concentration (2.7 mg/L) exceeded the MCL (1 mg/L).

The current detections of nitrate and nitrite in groundwater are generally one to two orders of magnitude lower than historical results and are limited to the monitoring wells located immediately downgradient of the HB.

2.4.5.3 *Geochemical Parameters*

Several geochemical parameters (chloride, fluoride, sulfate, alkalinity, carbonate, and phosphorus) were analyzed for in groundwater samples from 20 overburden and bedrock groundwater monitoring wells on the NMI Property according to the sample plan (Table 2-1). A full summary of the geochemical parameter results from the November 2019 sampling round is presented in Table 2-8.

Overburden Groundwater

Geochemical parameters analyzed in samples from 12 overburden monitoring wells can be summarized as follow:

- Chloride was detected at all overburden monitoring wells at concentrations ranging from 11 mg/L at MW-S21 to 76.5 mg/L at MW-S01.

- Fluoride was detected at seven overburden monitoring wells at concentrations ranging from 0.038 J (estimated) mg/L at MW-S02 to 0.159 mg/L at MW-S01.

- Sulfate (as SO_4) was detected at all overburden monitoring wells at concentrations ranging from 3.91 mg/L at GZW-7S to 46.2 mg/L at MW-S24. These sulfate concentrations are similar to the historical range (5.91–62.1 mg/L) reported for overburden groundwater in the RI.

- Alkalinity (bicarbonate as $CaCO_3$) was detected at all overburden monitoring wells at concentrations ranging from 8.8 mg/L at MW-S22 to 42.4 mg/L at MW-S01. This range is similar and slightly lower than the historical range (2–67 mg/L) reported during the RI.

- Carbonate (as CO_3) was not detected above the laboratory detection limit (2 mg/L) at any overburden monitoring wells.

- Phosphorus (using the higher of the initial and reanalysis results) was detected at all overburden monitoring wells at concentrations ranging from 0.007 mg/L at HBPZ-2R and GZW-7-1 to 0.143 mg/L at MW-SD02.

Bedrock Groundwater

Laboratory results for 8 bedrock wells sampled for geochemical parameters can be summarized as follows:

- Chloride was detected in all bedrock monitoring wells at concentrations ranging from 4.56 mg/L at MW-BS12 to 66.6 mg/L at MW-BS21.

- Fluoride was detected in all bedrock monitoring wells at concentrations ranging from 0.051 mg/L at MW-BS28 to 0.404 mg/L at GZW-7-2.

- Sulfate (as SO_4) was detected in all bedrock monitoring wells at concentrations ranging from 15.5 mg/L at MW-BS10 to 322 mg/L at GZW-10-2. These results are generally lowered compared to the historical sulfate range (4.4–929 mg/L) reported in the RI. The reported background range for sulfate at the Site is 6.6 mg/L to 108 mg/L.

- Alkalinity (bicarbonate as $CaCO_3$) was detected at 6 bedrock monitoring wells at concentrations ranging from 68.5 mg/L at MW-BS10 to 222 mg/L at MW-BS03. Historically, the highest alkalinity was measured at MW-BS25 (1,630 mg/L) which was not sampled in November 2019, and the reported range for background wells (MW-BS12 and MW-BS21) was 52.5 to 97 mg/L during the RI.

- Carbonate (as CO_3) was detected in 1 bedrock well, MW-BS11 at 67.9 mg/L. This concentration is similar to the background range (45.8–55.3 mg/L) reported in the RI.

- Phosphorus (using the higher of the initial and reanalysis results) was detected at all bedrock monitoring wells at concentrations ranging from 0.005 mg/L at MW-BS28 to 0.194 mg/L at MW-BS02.

2.4.5.4 *Field Parameters*

Field parameters (dissolved oxygen [DO], oxidation-reduction potential [ORP], pH, specific conductance, temperature, and turbidity) were measured as part of low-flow sampling procedures per SOP NMI-GW-010. The field parameters recorded at each monitoring well prior to sampling are presented in Table 2-2b. The results for overburden and bedrock wells sampled in November 2019, excluding results from municipal wells Assabet 1A/2A, EW-1, and BarCad sampling system wells, which are not sampled using continuous purging per the low-flow protocols, are summarized below.

Overburden Groundwater

The ranges of field parameters reported for 89 overburden monitoring wells sampled using the low-flow method can be summarized as follows:

- DO readings 0.0 to 11.87[1] mg/L with an arithmetic mean of 5.2 mg/L in overburden groundwater. These results are similar to the range (0.01–16.6 mg/L) reported for sampling events summarized in the RI report. However, the percentage of overburden wells with anoxic conditions (DO less than 0.5 mg/L) was 30% in November 2019, as compared to 12% reported during the RI. Oxic conditions (DO greater than 2 mg/L) were reported for 65% of the wells in November 2019, as opposed to 75% of the wells during the RI.
- ORP readings in overburden wells ranged -139.1 to 357.9[2] millivolts (mV) with an arithmetic mean of 126 mV. Over 91% of ORP measurements in overburden groundwater in November 2019 were positive, indicating oxidizing conditions, which is similar to the 95% of measurements reported for monitoring rounds summarized in the RI report.
- pH readings ranged from 5.24 to 7.8 standard units (SU) with an arithmetic mean of 6.2 SU in overburden groundwater which is similar to the range of pH measurements reported during the RI (4–12.9 SU). Additionally, 61% of the overburden locations had a circumneutral pH (between 6 and 8 standard units) in the November 2019 event as compared to the 65% of locations during the RI.
- Specific conductance ranged from 27.3 to 2,474 micro Siemens per centimeter (µS/cm) with an arithmetic mean of 1534 µS/cm in overburden groundwater.
- Temperature ranged from 3.26 to 13.65 degrees Celsius (°C) with an arithmetic mean of 9.87 °C in overburden groundwater.

---

[1] The reported range and statistics exclude a DO measurement of 920 mg/L for well OW-1 which appears erroneous.

[2] The reported range and statistics exclude the ORP measurement of 1166 mV reported for well MW-T10 which is interpreted to be erroneous.

- Turbidity in samples collected from overburden wells ranged from 0.09 to 461[3] Nephelometric Turbidity Units (NTU) with an arithmetic mean of 15.86 NTU.

Bedrock Groundwater

The ranges of field parameters reported for 27 bedrock monitoring wells sampled using the low-flow method can be summarized as follows:

- Dissolved oxygen readings ranged from 0.04 to 4.33[4] mg/L with an arithmetic mean of 0.72 mg/L. These results are slightly lower compared to the historical range of 0.16 to 10 mg/L reported in the RI report. DO concentrations lower than 1 mg/L were reported in at least one instance for 13 of the 23 wells sampled during the RI, as compared to 22 of the 27 wells sampled in November 2019. DO values indicative of oxic conditions were reported at 3 wells (GZW-11-2, MW-BS12, and MW-BS21) sampled in November 2019.
- ORP readings ranged from -490 to 96.6 mV with an arithmetic mean of -115.8 mV. In comparison to the -270 to 550 mV range reported in the RI report, these results appear to indicate that the ORP in bedrock groundwater has shifted toward slightly more reducing conditions. This is further supported by negative ORP being measured at 19 of the 27 (70%) of bedrock locations sampled in November 2019, as compared to 13 of the 23 (56%) locations during the RI.
- pH readings ranged from 6.48 to 12.87[5] SU with an arithmetic mean of 8.3 SU. The pH range for bedrock groundwater is similar to the range reported during the RI (6 to 13 SU). Slightly more bedrock locations had a circumneutral pH during the RI (63% of locations), compared to November 2019 (56% of locations).
- Specific conductance ranged from 75 to 2386 µS/cm with an arithmetic mean of 570.1 µS/cm.
- Temperature ranged from 4.60 to 14.85 °C with an arithmetic mean of 9.94 °C.
- Turbidity ranged from 0.75 to 93.8 NTU with an arithmetic mean of 10.1 NTU in samples collected from bedrock wells.

2.5 Conclusions

The November 2019 comprehensive groundwater gauging and sampling event was conducted to prepare a baseline assessment of groundwater conditions at the initiation of the RD activities. The distribution of COCs and secondary parameters established from the sampling event is essential to

---

[3] The reported range and statistics exclude a negative turbidity measurement reported for well MW-S32 which is interpreted to be erroneous.

[4] The reported range excludes negative DO values reported for wells MW-BS04 and MW-BS25 which are interpreted to be erroneous. The statistics assume that the DO in these wells was lower than 1 mg/L.

[5] The reported range excludes a pH measurement of 0.86 standard units reported for well MW-BS17 which is inferred to be erroneous.

support the RD as well as other PDIs. Several compounds were detected above the MCL or ROD cleanup level, including 1,4-dioxane, metals (uranium, arsenic, cobalt, magnesium, thorium, molybdenum, and iron) and VOCs (PCE, TCE, and 1,1-DCA). The concentrations of these compounds have generally decreased compared to the results summarized in the RI report (*de maximis*, 2014) and remain confined within the existing uranium and 1,4-dioxane plumes, which are the primary targets of the RDWP and future remediation activities. Similarly, the current concentrations of geochemical parameters in overburden and bedrock groundwater are generally slightly lower compared to historical ranges indicating attenuation over time; this is especially true for nitrate. Additionally, investigation of PFAS compounds at the Site indicate low concentrations at the NMI Property and downgradient areas except for GZW-7-2 where the PFAS concentrations are believed to be biased by the materials used to construct and install the BarCad sampler at this location. The November 2019 sampling event did not identify previously unknown exceedances or undetected compounds in Site groundwater and does not warrant supplemental investigations or remedial activities aside from those already included in the RDWP.

3. PDI ISS-2: PUMPING AND REBOUND ANALYSIS FOR URANIUM IN BEDROCK GROUNDWATER

3.1 Introduction and Objective

The Consent Decree (CD) and the accompanying SOW for the Site describe the Remedial Design/Remedial Action (RD/RA) activities to be performed to address uranium and 1,4-dioxane in soils and groundwater at the Site. The in situ stabilization requirements of the SOW includes developing a remedy for the uranium-impacted bedrock groundwater. This predesign investigation (PDI) work plan for in situ sequestration (ISS), referred to as PDI ISS-2, describes the approach, means, and methods to evaluate the feasibility of a pumping remedy for uranium in bedrock groundwater beneath the property and off-property areas. Standard operating procedures (SOPs) identified for use during this PDI are outlined above in Section 1.4 and are found in the field sampling plan (FSP).

This PDI has been developed based on existing Site data collected during historical investigations summarized in the 2014 Remedial Investigation/Feasibility Study (RI/FS) (*de maximis*, 2014) and analytical data collected during the November 2019 comprehensive groundwater monitoring event described under PDI ISS-1. The November 2019 event represents the baseline uranium and 1,4-dioxane distribution for the remedial design (RD).

A separate PDI work plan (PDI 14D-1) for addressing the delineation and a possible pumping remedy for 1.4-dioxane in bedrock groundwater is included as Appendix D of the RDWP. Many of the components of PDI ISS-2 are applicable to the 1,4-dioxane plume and thus the procedures, figures, and tables overlap in content. Where applicable, PDI 14D-1 is subordinate to this work plan, and references PDI-ISS-2 where appropriate. Figures showing proposed well locations in bedrock for PDI-ISS-2 include wells targeting both uranium and 1,4-dioxane and are thus identical to figures presented for PDI 14D-1.

3.1.1 Purpose

This PDI-ISS-2 work plan was developed to detail the field activities to be conducted to further define the distribution of uranium in bedrock groundwater, assess the hydraulic properties of the bedrock aquifer, and collect data required to evaluate the feasibility of a pumping remedy. The following data will be collected as part of the scope presented in this work plan:

- Water quality data to further delineate the vertical distribution of uranium and 1,4-dioxane in bedrock relative to Site remediation goals (RGs).
- Hydraulic characteristics of the bedrock aquifer, including fracture connectivity, transmissivity, and yield.
- Uranium concentrations and volume of extracted water to evaluate whether the uranium-impacted groundwater can be removed by pumping to meet remedial action objectives (RAOs) for uranium in bedrock groundwater.

The specific methods used to collect these data are presented in the following sections.

3.2 Bedrock Hydrogeology

Brief descriptions of the bedrock type, depth to bedrock and bedrock surface topography, depth to groundwater in bedrock wells, and hydraulic conductivity and hydraulic gradients are presented below.

3.2.1 Bedrock Type

Descriptions of Site bedrock cores along with evidence from cores collected at the W.R. Grace Superfund Site north of the Assabet River (GeoTrans 2002), and the Rockland Avenue Well Site in Maynard (Walsh 2001), indicate that the Site is predominantly underlain by the Shawsheen Gneiss of the Nashoba Formation. At the majority of locations where shallow bedrock cores were collected on the NMI Property area, the rock was described as relatively unweathered and unfractured. However, based on cores collected in the upper 15 feet (ft) of bedrock at MW-BM03 and the entire borehole length at MW-BS15 (downgradient near the Assabet River), the rock was highly fractured.

3.2.2 Depth to Bedrock and Bedrock Surface

The depth to bedrock across the NMI Property was mapped during the RI and supplemented with data from the downgradient area between Route 62 and the Assabet wellfield during the GW NTCRA groundwater investigations (Geosyntec 2016, 2017a, 2017b). The depth to bedrock ranges from 37 feet below ground surface (ft bgs) at well MW-BS22 north of the Holding Basin (HB) to over 150 ft bgs at MW-BS14, MW-BS28 and GZW-11-2 at the northwest corner at the downgradient end of the NMI Property where a thick accumulation of stratified drift is located. A depth-to-bedrock map is shown on Figure 3-1. The bedrock surface is at the highest elevation beneath the eastern side of the Site beneath the Old Landfill and the Sphagnum Bog (110 to 120 ft above mean sea level [msl]) and slopes westward to less than 30 ft in elevation at MW-BS14 and MW-BS31 located near Route 62. A bedrock elevation contour plan is shown on Figure 3-2. There is a bedrock ridge extending from the area near well MW-BS25 to the north, from there the bedrock then slopes downward and northward to the Assabet River to a lowest reported elevation of less than 15 ft at GZW-8-2. From the HB to the Assabet River, the top of bedrock elevation drops approximately 90 ft.

3.2.3 Depth to Groundwater, Potentiometric Levels, and Hydraulic Gradients in Bedrock

From upgradient of the HB to downgradient near the river, the depth to water in bedrock wells ranges from approximately 40 ft in the upgradient area of the Site (MW-BS12 and MW-BS21) to approximately 55 to 60 ft downgradient of the HB (GZW-7-2, MW-BS02) to 23 ft at Route 62 (MW-BS25) to less than 10 ft near the Assabet River (GZW-8, MW-BS26). The greatest depth to groundwater is in the northwest portion of the Site on the plateau where ground surface is higher (elevation 190 to 195 ft) where it is between 65 and 70 ft at MW-BS28 and MW-BS14.

The bedrock potentiometric level is typically within the deep overburden in the upgradient portions of the Site and within the shallow overburden in the downgradient areas near the Assabet River. The groundwater potentiometric elevation contours inferred from November 2019 depth-to-water measurements are presented on Figure 2-4b. Similar to the overburden aquifer, there is approximately 20 to 25 ft of head drop from the upgradient area on the southeastern portion of the Site near the Sphagnum Bog (elevation 146 ft) to the downgradient portion near the Assabet River (elevation 124 ft).

The hydraulic gradient in bedrock is oriented northwest from the HB to the Skating Rink near the Assabet River and then westward toward the Town of Acton's Assabet 1A pumping well. The horizontal gradients in bedrock based on depth-to-water levels measured in November 2019 range from an average 0.017 feet per foot (ft/ft) at the HB area to 0.005 ft/ft in the northwest portion of the Site (GZW-10 to MW-BS28 area). The gradients become flatter in the downgradient portion of the Site to 0.002 ft/ft in the MW-BS31 to MW-BS34 area (Figure 2-4b).

Vertical gradients observed during the November 2019 water level round indicated upward vertical gradients from deeper rock to shallow rock at MW-BS03/BM03 and MW-BS15/BM15. The vertical gradients between the bedrock and overburden indicated downward gradients from overburden to bedrock on the western portion of the NMI Property (MW-S03/BS03, MW-S04/BS04, and GZW-10-1/10-2) with upward gradients from bedrock to overburden in the central and northern portion (MW-S01/BS01, MW-S02/BS02, MW-S13/BS13).

Upward vertical gradients were consistently measured from the bedrock to the overburden in the downgradient areas near the Assabet River (GZW-8-2 to GZW-8-1 and MW-BS15 to MW-S15, MW-BS32 to MW-SD32, MW-BS34 to MW-SD34, MW-BS35 to MW-SD35).

3.3 Contaminant Sources and Distribution in Bedrock

Although the precise mechanism for uranium mobilization into bedrock groundwater has not been defined, the elevated uranium concentrations in the central portion of the Site suggest that geochemical impacts from the HB or other sources at the Site may have enhanced the solubility of naturally occurring uranium-bearing minerals present in the bedrock beneath the Site. Uranium has been detected in groundwater from the Nashoba Formation in other wells in the area, including the upgradient background wells MW-BS12, MW-BS21, and MW-BS22.

The mechanism for the release of 1,4-dioxane to the Site groundwater has also not been defined. However, 1,4-dioxane was used as a stabilizer in 1,1,1-trichloroethane and possibly other solvents, and these solvents were used at the Site and released as a co-contaminant. 1,4-dioxane was not detected in soil, surface water, or sediment at the Site, suggesting that there are no residual sources of 1,4-dioxane in these media.

Isolated MCL exceedances of metals in bedrock groundwater discussed in Section 2.4.5, including arsenic, cobalt, iron, manganese, and thorium, are generally contained within the uranium and 1,4-dioxane plumes. Although this work plan does not specifically target these metals, water quality samples collected as components of tests for uranium will be analyzed for these metals to further understand their occurrence and changes in concentration during pumping and rebound as described in Sections 3.4.6 and 3.5.4.

3.3.1 Uranium Distribution in Bedrock

The uranium distribution in bedrock groundwater and the isoconcentration contours inferred from data collected in November 2019 are depicted in cross section on Figures 2-6 and 2-9 and in plan view on Figures 2-7 and 2-8. The zone of elevated uranium above the MCL of 30 µg/L extends southeast to northwest, from the area of the HB (GZW-7-2) to just upgradient of MW-BS28 in the northwest corner of the Property. Results from the November 2019 sampling event indicate the highest concentrations were detected as follows:

- To the northwest at MW-BS13 (65.3 µg/L) and GZW-10-2 (71.1 µg/L)
- In the central portion of the property adjacent to the former buildings at MW-BM03 (45.3 µg/L) and MW-BS03 (69.6 µg/L)
- Near the HB at GZW-7-2 (47.2 µg/L)

Concentrations decline to levels below the MCL (30 µg/L) within the Property limits.

The distribution above the MCL is roughly the same as previous sampling rounds; however, the highest concentrations at the Site have declined significantly from the 151 µg/L at MW-BS03 in 2013 to a maximum of 71.1 µg/L at GZW-10-2.

3.3.2 1,4-dioxane Distribution in Bedrock

The 1,4-dioxane distribution in bedrock groundwater and the general extent of the plume exceeding the 2015 ROD cleanup level (0.46 µg/L) as inferred from data collected in November 2019 is depicted in plan view on Figure 2-7a and in cross section on Figure 2-9. The plume extends from the HB area (37.4 µg/L at GZW-7-2) to downgradient of the former facility footprint (99.1 µg/L at MW-BS13 and 55.4 µg/L at GZW-10-2), to the area between Route 62 and the Assabet River (73.6 µg/L at MW-BS15 and 36.2 µg/L at MW-BS32).

It is inferred that groundwater containing 1,4-dioxane discharges from bedrock to deep overburden near the Assabet River as demonstrated by persistent elevated detections of 1,4-dioxane in deep overburden well MW-SD34. The plume was historically identified to extend beneath the Assabet River and toward the Assabet 1A municipal well (Geosyntec 2016); however, the concentrations west of the Assabet River have dissipated below the cleanup level after the hydraulic containment system at EW-1 began operation in June 2016.

3.4 Bedrock Well Installation

This section describes new bedrock well locations, drilling methods, monitoring activities to be performed during drilling, well development and open borehole testing, including borehole geophysics and packer testing. The following subsections include the selection method used for additional well locations as well as plans for well installation methods, parameters to monitor during drilling, open borehole well development, water management, open borehole testing, and alternatives for installing well screens and managing an unstable borehole.

3.4.1 New Well Location Selection

Three open bedrock extraction wells (BEWs), BEW-1, BEW-2, and BEW-3, will be installed within the core (50 µg/L contour) of the uranium plume and core (30 µg/L contour) of the 1,4-dioxane plume using methods described in Section 3.4.2 The locations for these wells are shown on Figure 3-3. The locations of the wells were selected to coincide with the highest detected concentrations of uranium. Based on testing as part of this work plan it is hoped that this distribution of wells will result in zones of influence during pumping that will cover significant portions of the uranium plume, although hydraulic connectivity in bedrock under pumping is not fully understood for the Site. The new well locations were also selected to provide further delineation of the vertical depth of uranium and 1,4-dioxane at concentrations above the RG.

BEW-1 will be installed at the southeastern portion of the uranium plume near and downgradient of the HB and well GZW-7-2. BEW-2 will be installed in the central portion of the uranium plume near bedrock monitoring well clusters MW-BS02 and MW-BS03. BEW-3 will be installed further west, in the portion of the uranium plume approximately halfway between MW-BS13 and GZW-10-2 where the highest uranium and 1,4-dioxane concentrations were detected in November 2019. Further details pertaining to the proposed well locations, the expected depth to bedrock, and the target depths into bedrock are presented in Table 3-1. The total depth of the proposed open borehole bedrock wells was selected at 60 ft below the bottom depth of the nearest monitoring well exceeding the uranium MCL. The proposed target depths relative to the top of bedrock and the distribution of uranium and 1,4-dioxane concentrations are shown in cross section on Figure 2-9. It is anticipated that advancing the boreholes to these depths will be sufficient to provide vertical delineation of the uranium and 1,4-dioxane within the footprint of the bedrock uranium plume.

3.4.2 Well Installation Methods

This section describes the installation method for bedrock wells planned for PDI ISS-2. Two proposed drilling methods are described in this section. Depending on equipment and vendor selection, one of these methods will be used.

A 6-inch nominal bedrock borehole was selected for bedrock wells because this diameter can accommodate a suite of borehole geophysical tools, straddle packer equipment, and moderate-output (1–10 gallons per minute) submersible pumps that are desired for sustained extraction during the pumping and rebound testing. The sampling of discrete fractures/fracture zones within the open boreholes will provide additional uranium and 1,4-dioxane analytical data to assess the vertical distribution of these contaminants above their respective cleanup goals within bedrock. The larger diameter wells, as proposed, will also provide the avenue for open borehole or discrete fracture zone injection and reagent delivery pilot testing, in the event that pumping is not deemed a viable remedy for uranium in bedrock and the need for in situ treatment arises. Lastly if the vertical delineation is not achieved based on the results from packer testing described below, then open borehole wells can be extended deeper.

3.4.2.1 *Overburden Drilling*

It is anticipated that rotosonic or dual rotary methods will be used to drill through the overburden. Due to the limited availability of dual rotary drilling equipment the rotosonic methods are likely to be used in the overburden. Below are the expected drilling methods based on discussions with the driller, however, means and methods may be adapted in the field depending on what is encountered, equipment, and other factors.

Rotosonic

If rotosonic drilling is used to advance the boreholes through the overburden, the driller will first advance a 9-inch core barrel and a 10-inch diameter override casing through the overburden and several feet into bedrock. Once the bedrock is intercepted, the field geologist will pay close attention to the rock cores to evaluate the integrity of the bedrock for the purpose of setting the permanent steel casing. If the bedrock is of sufficient integrity for the casing, the drilling will be suspended, and the driller will remove the drill string from the borehole. The driller will then assemble the permanent casing by lowering 10-foot sections of 6 or 7-inch threated flush-joint casing inside the 10-inch outer casing and into the bedrock socket. The permanent casing will be centered within the 10-inch casing and fitted with a drive shoe that will be spun approximately a few inches into the bedrock. The driller will subsequently grout the annular space between the permanent casing and the 10-inch temporary casing with cement and bentonite grout via a tremie pipe. As the grout is tremied into the annular space, the 10-inch casing will be incrementally removed from the borehole. Once the grout is determined to have cured, the driller will reconfigure the drilling rig for air rotary drilling and begin advancing the bedrock borehole as described below in Section 3.4.2.2.

Dual Rotary

This method will not require mixing of mud or advancing a larger borehole to set a 6-inch casing through overburden. Dual rotary drilling is a combination of a top drive (drilling head) advancing an inner drill stem, drill bit and bottom drive, which simultaneously advances a casing with a carbide-studded shoe welded to the bottom. The rotary top drive operates independently of the bottom drive and can be fitted with a tricone (i.e. roller) bit or an air hammer which is advanced along with the casing. The top and bottom drives rotate in opposite directions and ensure a straight and vertical borehole. In heaving formations, the casing can be advanced slightly ahead of the bit to isolate the drill bit from the formation.

The driller will advance a cased borehole through the overburden in increments determined by the length of the steel casing and/or drilling rods. After a casing length is advanced, drilling will be suspended to weld on additional sections of steel casing and add drill rods. The cuttings will be evacuated from the annular space between the drill string and casing using air supplied by an onboard or auxiliary compressor. The cuttings will be directed into a cyclone suspended over drums or a roll-off. The field geologist will collect and describe the drill cuttings at approximately 5-ft increments. Once the bedrock is intercepted, the field geologist will pay close attention to the rock cuttings to evaluate the integrity of the bedrock for the purpose of setting the permanent steel casing. Once the bedrock socket is determined to be of sufficient integrity for the casing, the drilling will be suspended, and the driller will remove the drill string from the borehole. The driller will subsequently spin the outer casing up to within 1 to 2 ft of the top of bedrock and pump a volume of cement bentonite grout equal to 1.5 times the volume required to fill the bedrock socket to the bottom of the borehole. Once the grout is placed in the bedrock socket, the driller will spin the outer casing back down to the bottom of the borehole. The grout is intended to seal the bedrock borehole from the overburden and will be allowed to set overnight.

Once the grout is determined to have cured, the driller will reconfigure the drilling rig for air rotary drilling and begin advancing the bedrock borehole as described below.

3.4.2.2 *Air Rotary Drilling in Bedrock*

With a casing set into the top of rock, air rotary drilling is then used to drill through the casing and into bedrock. During air rotary drilling, transducers installed in nearby monitoring wells will be used to monitor the hydraulic response to air rotary drilling. This response enables evaluation of fracture connectivity between bedrock wells. Prior to the drilling, the field geologist will measure the depth to water in the nearest deep overburden wells. The water levels will be monitored as the borehole is advanced to evaluate whether the grout seal remains intact during drilling. The cuttings will be containerized into drums or roll-offs, and one 5-gallon bucket of cuttings from each borehole will be collected and set aside for bedrock treatability testing (if required) as described in Appendix E to the RDWP. Air rotary drilling methods are described in SOP NMI-S-004.

The air rotary drilling will be suspended to develop individual fractures/fracture zones by air lifting when these fractures/fracture zones are intercepted during drilling (air lifting consists of pumping compressed air down the drill string and through the drill bit to evacuate water, residual drill cuttings and fines). The specific field logging and monitoring activities during drilling are described in Sections 3.4.3 and 3.4.4.

Upon reaching the target borehole depth, the entire length of the borehole will be developed by air lifting per SOP NMI-GW-002. The borehole will be left open with steel casing sealing the overburden. The steel casing will be cut approximately 1.5 to 2.5 ft above the ground surface, and the top of the casing will be leveled and the top marked or notched to identify a measuring point for all water level measurements at the well. The elevation of this mark/notch will be surveyed according to SOP NMI-009. The well will then be fitted with a suitable slip-on cap or waterproof cap (e.g., Royer Locking Well Cap) on the top of the casing to reduce the potential for debris to enter the borehole. All wells will be secured with a padlock.

3.4.2.3 *Replacing BarCad® Well GZW-7-2*

Well GZW-7-2 consists of a BarCad groundwater sampling system installed inside an uncased and backfilled bedrock borehole. The BarCad sampler itself is a 1.5-inch-diameter, 16-inch-long porous filter set from 111.5 to 113 ft bgs and approximately 11.5 to 13 ft below the top of bedrock. The sampler is equipped with an internal check valve connected to tubing that extends to the ground surface. A smaller inner tube extending to the bottom of the outer tubing provides a means of collecting the samples by pressuring the annular space with inert gas. Although the samples collected from this location have historically been important for evaluating the bedrock uranium concentrations immediately downgradient of the HB, the BarCad system is outdated, does not support continuous purging and sample collecting using the low-flow procedures, and does not allow water level to be measured. In addition, this well had anomalously high PFAS detection in

November 2019 (214 nanograms per liter [ng/L]) as described in PDI ISS-1. These detections may be attributable to the materials used in the BarCad sampler. For these reasons, GZW-7-2 will be replaced with a traditional monitoring well (MW-BS7-2).

The replacement well (MW-BS7-2) will be advanced using rotosonic drilling methods at the closest accessible location (approximately 15-20-ft) downgradient of GZW-7-2 (Figure 2-3). The driller will advance a borehole through the overburden and approximately 2–3 ft into bedrock using a 4.75-inch-diameter core barrel and 6-inch-diameter override casing (or similar). Once the override casing is properly seated into competent bedrock, the driller will install a 7-inch (or similar) override casing to accommodate rock coring tooling and retrieve the 6-inch casing. The driller will subsequently retool the drilling rig to advance a 3.75 -inch-diameter (HQ) or 4.8-inch diameter (PQ) (or similar) bedrock borehole using Wireline Coring methods to a depth of approximately 18–20 ft below the top of bedrock. The cores will be retrieved and logged by the field geologist for rock type, fracture characteristics, and weathering. The drilling water loss will be tracked and will be targeted as the minimum volume to be removed during well development. The optimal well screen placement will be determined based on the location(s) of water bearing fractures inferred from the rock cores. Sonic drilling methods are described in SOP NMI-S-004.

The well will be constructed using 2-inch-diameter, 10-slot Schedule 40 polyvinyl chloride (PVC) well screen and an appropriate length of 2-inch-diameter Schedule 40 PVC riser. The length of the well screen (5 or 10 ft long) will be selected in the field based on the location and spacing of water bearing fractures that intercept the borehole. Filter pack will consist of appropriately sized filter sand (Morie's #0). Sand filter pack will be extended 2 ft above the top of the well screen and overlain by 1 ft of #00 "choker sand" followed by a 3-ft-thick bentonite chip seal. The annular space above the bentonite seal will be filled with a cement/bentonite grout to the ground surface. The well will be equipped with flush-mount or standpipe protective casing to prevent surface water inundation and provide security. Well construction is described in SOP NMI-GW-003. The well will be developed using a combination of mechanical surging, pneumatic surging and lifting, and pumping as described in SOP NMI-GW-002. The new well will be surveyed according to SOP NMI-009 following installation.

Samples for 1,4-dioxane analysis using USEPA Method 8270 SIM and total uranium (U^{235}/U^{238}) using USEPA Method 6020A ICP-MS will be collected from the newly installed well concurrently with samples from GZW-7-2. Samples will be collected according to SOPs NMI-002, NMI-003 and NMI-GW-011 or NMI-GW-014. It is anticipated that at least three co-sampling events will be needed to establish whether the results from the MW-BS7-2 are comparable to GZW-7-2. Once the results are comparable, well MW-BS7-2 will cease to be used for sampling and monitoring going forward in the project and may be decommissioned (SOP NMI-GW-004).

3.4.3 Monitoring Activities during Drilling

Several types of data, including geology inferred from drill cuttings and aquifer response, will be collected during drilling to help characterize the bedrock aquifer. The methods used to gather this data are described in the subsections below.

3.4.3.1 *Field Logging*

During drilling, the field geologist will monitor and document drilling rates and water production or losses. Drilling fluid loss will be used to inform total volume of water to be purged during well development. The field geologist will also monitor, inspect and log drill cuttings for color, rock type, consistency, drilling rate, as well as minerology, including pyrite to the extent possible, to assess the mineral composition and lithology changes (see SOP NMI-S-006). During rotary drilling, the drill cuttings will be collected every 5 ft from the return stream using a screen (e.g., a strainer) and washed using potable water to expose the solid cuttings. When bedrock is first intercepted, the field geologist shall collect the cuttings at a higher frequency (i.e., every 1 or 2 ft) to assist in evaluating the integrity of the shallow bedrock for the installation of the steel casing. During air rotary drilling in bedrock, the observations of changes in the consistency, color, and volume of the cuttings in conjunction with the driller's observations will be used to infer water-bearing fractures and zones of softer or less competent bedrock. The field geologist will record the time and depth of each inferred water-bearing fracture intercepted during drilling. Well installation and construction data will be summarized in the field notes. A construction report for each well will be completed in the field by the field geologist (see SOP NMI-GW-003). An inventory of number of investigation-derived waste (IDW) drums, contents, and origin will be included in the field notes. IDW will be handled and stored in accordance with procedures outlined in SOP NMI-005.

3.4.3.2 *Aquifer Response Monitoring*

Because a water level response at nearby monitoring well(s) during drilling is likely to help to identify hydraulically active zones relative to particular depths at drilling locations, prior to the well installation, pressure transducers equipped with data loggers will be installed to monitor water levels. Transducer locations will be targeted for selected existing and newly installed bedrock monitoring wells (described in the 1,4-dioxane work plan [Appendix D]). To monitor the background groundwater levels, the pressure transducers will be installed approximately one week prior to the start of drilling and will initially be programmed with a long logging interval (e.g., 15 or 30 minutes). Immediately prior to the drilling activities, the pressure transducers will be reprogrammed to record on a shorter time interval (e.g., 1 or 5 seconds) to ensure that the time of the water level response can be correlated to the depth of the borehole being advanced.

The transducers will be installed using the Pressure Transducer Installation Log Provided in Appendix A. The pressure transducers will be a non-vented type (e.g., Solinst Levelogger Model 3001 or equivalent), and their data will be barometrically compensated using ambient air pressure data collected by a Barologger deployed at the Site. Geosyntec will compare the pressure transducer data to the field notes documenting the borehole advancement to evaluate fracture connectivity across the bedrock aquifer in the uranium/1,4-dioxane plume areas as a response to air rotary drilling. The locations of the wells selected for transducers are presented on Figure 3-4, and the list of locations is presented on Table 3-2. In addition to the monitoring of nearby bedrock wells, the field geologist will monitor the water levels in existing deep overburden wells per SOP NMI-GW-009 to evaluate the connection between the two aquifers.

3.4.4 Open Borehole Development

Intermediate development of water-bearing fractures/zones will be completed during air rotary drilling to remove fine particles to enhance the hydraulic connection between the borehole and the intercepted fractures. After a water-bearing fracture is intercepted, the borehole advancement will be suspended, and the zone will be developed by air lifting (i.e. pumping compressed air down the drill string and through the drill bit to evacuate water and residual drill cuttings). The volume of water generated during development will be tracked over time and used to estimate the fracture yield. Development of fractures will continue until the turbidity of water produced from the boring is low (e.g., <50 Nephelometric Turbidity Units [NTU]) and the water is clear to the naked eye. After a fracture zone is developed or goes dry, drilling activities will resume. After each successive water-bearing fracture is encountered and then developed, the volume of water generated during air lifting per unit time will represent a cumulative yield of the fracture being developed and the previously intercepted fractures.

After drilling is completed, the entire open borehole will be developed by airlifting to remove fine particles that may have accumulated during well installation and improve the quality of the borehole water in preparation for downhole geophysical logging, particularly to improve the clarity of the optical televiewer image. The borehole development will continue until the turbidity of the generated water is low (e.g., <50 NTU), the water is clear to the naked eye, and, at a minimum, the volume of water generated exceeds any water lost to the formation during rotary drilling (if used). Although, the open borehole wells are intended to be used as open borehole wells for pumping and rebound analyses, a possibility exists that the bedrock at the selected drilling locations is highly fractured/weathered and will not support an open borehole. In the event the borehole is unstable and well screens need to be installed in the borehole to span discrete fractures or fracture zones, additional development of the screen interval will be performed (see Sections 3.4.7 and 3.4.8). The screened interval will be developed using a surge block equipped with a check valve (e.g., Waterra inertial pump) to flush the filter pack, and then the screened interval will be purged using a submersible pump. The screened interval will be considered developed when turbidity readings are below 5 NTUs and at least five screened interval volumes total of purge water have been removed (see SOP NMI-GW-002). Purge water from each well will be containerized in labeled drums or fractionation tanks.

3.4.5 Water Management

Groundwater generated during rotary drilling and open borehole well development will be stored on-site, tested, and disposed of as investigation-derived waste (IDW).

IDW generated during mud and air rotary drilling will contain a mixture of water and cuttings and will be handled using procedures outlined in SOP NMI-005. At each drilling location, the driller will set up a plastic-lined drilling pad. The sides of the pad will be elevated (e.g., plastic over hay bales or similar) to contain the cuttings generated during drilling. Cuttings mixed with water will be transferred into a fractionation tank(s) staged on-site. IDW water generated during open borehole drilling and/or development will contain lesser amounts of solids and be handled using the same methods. The liquid cuttings in the fractionation tanks will be allowed time for the solid particles to settle and provide the opportunity for samples to be collected for laboratory analysis.

The fractionation tank(s) will be sampled for a suite of analytes, such as those listed below, for evaluating disposal and treatment options:

- Volatile organic compounds (VOCs) by USEPA method 8260
- Semivolatile organic compounds (SVOCs) by USEPA method 8270D-SIM
- Total uranium (U^{235}/U^{238}) via USEPA Method 6020A ICP-MS
- Total and dissolved calcium, iron, manganese, magnesium via USEPA Method 6020A ICP-MS
- bromine, chlorine, fluorine, iodine by USEPA method 300.0
- Total dissolved solids by USEPA Method SM2540C
- Total suspended solids by USEPA Method SM2540D
- Additional cations (aluminum, barium, beryllium, cadmium, cobalt, copper, lead, magnesium, nickel, potassium, silver, sodium, titanium, tin, zinc, and arsenic) via USEPA Method 6020A ICP-MS or similar
- pH by USEPA Method 9040C or SM4500H+-B

The IDW will be sampled in accordance with procedures outlined in the quality assurance project plan. The final disposal of IDW will be determined and managed by *de maximis*.

3.4.6 Open Borehole Testing

A variety of downhole testing methods, which are described in the sections below, will be implemented to improve the understanding of the bedrock aquifer hydraulics and uranium/1,4-dioxane distribution at varying depths in new boreholes.

3.4.6.1 *Borehole Geophysics*

After the new bedrock wells are installed to target depths and developed, borehole geophysical logging will be conducted to confirm the locations of fractures and/or fracture zones and identify water-bearing fractures. To ensure that the turbidity of the borehole water has dissipated enough to yield high-quality geophysical logs, the geophysical logging will not commence until at least 48 hours after drilling is complete. The geophysical logging will include the caliper log, acoustic and optical televiewer, fluid temperature and resistivity, and heat pulse flow meter (HPFM) testing under ambient and pumping conditions. The borehole geophysical data will be used in conjunction with field observations during drilling (e.g., water production) to identify intervals with significant inflow/outflow. Specifically, the following geophysical data will aid in understanding bedrock fracturing and water bearing zones:

- Field observations of cuttings, driller-inferred fractures, and the optical televiewer data will be used to estimate depth intervals with open fractures.
- The acoustic televiewer log will be used to confirm the fracture identification and assess fracture orientation and the presence of fracture infilling.

- Inflections in fluid temperature and resistivity profiles will be used to identify the water chemistry regime within the open borehole and changes associated with fractures identified in televiewer logs, further informing if fractures are water-bearing.
- Ambient HPFM measurements will be taken at depths between the fractures identified from drilling and geophysical logs to measure the vertical flow regime in the open borehole.
- Additional HPFM measurements will be taken at the same depths as while pumping the borehole at a low flow rate (e.g., 0.5–1.5 gallons per minute [gpm]) from above the target depths. These data will be used to estimate the relative percentage of the total yield from the borehole from each of the suspected producing fractures.

The borehole data collected during geophysical logging will inform the selection of borehole intervals for packer testing and the construction of permanent monitoring well(s) within the boreholes if that alternative is pursued. The small amounts of IDW water generated during the pumping HPFM logging will be containerized in a steel 55-gallon drum and combined and managed with the IDW generated during drilling and well development.

3.4.6.2 *Packer Testing and Contaminant Monitoring*

The packer testing intervals in the newly installed open borehole wells will be selected based on borehole geophysical data as described above. Up to four discrete intervals per boring will be selected for packer testing. The packer spacing, inflation pressures and pumping procedures will follow those outlined in SOP NMI-GW-016. The packer apparatus will consist of three pressure transducers which will monitor the water column pressure below, within, and above the zone isolated by packers. The isolated interval will be pumped with a submersible pump at low rates determined in the field. After inflation of packers and prior to pumping, the water level within the interval isolated by packers will be allowed to equilibrate to inform the static or ambient head in the fracture. Pressure data collected during pumping by the pressure transducer located in the isolated zone will be converted to drawdown and, in conjunction with the pumping rates, used to estimate the hydraulic conductivity of the fracture zone.

The discharge water from each interval will be monitored for field geochemical parameters (temperature, pH, specific conductance, oxidation-reduction potential [ORP] and turbidity) using a flow-through apparatus (see SOP NMI-GW-010). The samples will be collected when (1) the field geochemical parameters stabilize to the low-flow criteria and a volume equivalent to at least three isolated interval borehole volumes are removed or (2) if the isolated interval is low yielding and the three volumes cannot be purged in a reasonable time frame the samples will be collected after three hours of pumping. The drawdown within the isolated interval may exceed 0.3 ft during purging, and, although it will be monitored, it will not be a criterion for sampling. Samples for laboratory analysis collected from the isolated intervals will include 1,4-dioxane by USEPA Method 8270 SIM and total uranium (U^{235}/U^{238}) by USEPA Method 6020A ICP-MS. Based on MCL exceedances of other metals and 1,4-dioxane in the vicinity of the proposed extraction wells, additional samples will be collected from the isolated interval for the analyses listed below.

- BEW-1/BEW-2 – arsenic, iron, manganese, cobalt, and thorium by USEPA Method 6020A ICP-MS, and 1,4-dioxane by Method 8270SIM

- BEW-3 – arsenic, iron, and manganese by USEPA Method 6020A ICP-MS, and 1,4-dioxane by Method 8270SIM

Prior to the packer testing, pressure transducers will be deployed at nearby bedrock monitoring wells in which a water level response was observed during drilling to assess whether there is a response, indicative of connectivity, when pumping individual intervals of the bedrock.

3.4.7 Well Screen Installation Alternative

The project team may decide to convert one of the open boreholes into a single or nested monitoring well after pumping and rebound testing is complete. This recommendation will be contingent upon the evaluation of the feasibility of pumping as a remedy for bedrock groundwater. It is likely that if the pumping appears to be a viable option for bedrock uranium mass removal, the wells will remain as open boreholes to accommodate 4-inch-diameter submersible pumps. In the event the wells are converted to permanent monitoring wells, the screen intervals will be selected based on the borehole geophysical data and the contaminant distribution in samples collected from discrete intervals isolated during packer testing.

The borehole selected to become a monitoring well will likely be the borehole with the deepest (lowest in elevation) water-bearing fracture with an elevated uranium concentration (>30 µg/L MCL) and/or 1,4-dioxane concentration. In the event that two fracture zones are selected for well installation, one of the wells may be constructed with a 1-inch PVC screen and riser due to size constraints in the 6-inch nominal borehole. The fracture zone where the 1-inch PVC screen is installed will be the less impacted zone (which is unlikely to be used for extraction/injection in the future) to be useful for water quality sampling and water level monitoring. The borehole beneath and between the screen intervals (if multiple wells are installed) will be sealed with bentonite chips or alternating zones of bentonite chips and sand. The well(s) will be constructed with a 5-ft or 10-ft 10-Slot PVC screen and appropriate filter sand to 2 ft above the well screen per SOP NMI-GW-003. The determination of what length screen to install will be determined based on the spacing and concentrations for water bearing fractures. A 1-ft zone of fine choker sand will be placed above the filter sand and beneath the bentonite to prevent fines released from the bentonite chips penetrating into the filter sand. A 3-ft-thick bentonite chip seal will be installed above the well screen, and the remainder of the borehole will be grouted to the ground surface using bentonite/cement grout. The monitoring well(s) will be developed in accordance with SOP NMI-GW-002.

3.4.8 Bedrock Instability Alternatives

A high degree of fracturing and borehole instability has been observed in bedrock boreholes advanced for the installation of wells MW-BS15 and MW-BM15 located downgradient of the NMI Property during the RI. Due to the bedrock instability, borehole geophysical testing could not be conducted at these locations. The deeper bedrock at the NMI Property locations MW-BM03 and SW-2A was observed to have sufficient integrity for the boreholes to remain open and facilitate borehole testing. Although, the proposed open boreholes for the uranium pumping and rebound testing are in the vicinity of wells MW-BM03 and SW-2A where bedrock appears to be more competent, a possibility exists that a high degree of fracturing in a particular location will prevent completing the wells as open boreholes. For planning purposes, it is anticipated that the bedrock formation in at least one of the proposed bedrock wells installed as part of the additional 1,4-dioxane delineation and extraction wells for the uranium rebound testing wells will not support an open borehole. It is proposed that in preparation for the drilling, two 10-foot-long, 4-inch-diameter, 10-slot wire wound (e.g., Johnson Screens) will be purchased and mobilized to the Site. In the event of borehole instability, the screens will be installed in the 6-inch nominal bedrock borehole. The top of the well screen will be welded to a 4-inch steel riser or threaded to schedule 40 PVC well riser pipe that will be extended above the ground surface. The annular space will be filled with appropriate filter sand (e.g. Morie #0) to approximately 2 ft above the top of the screen, followed by a foot of No. 00 choker sand, followed by a 3-ft bentonite seal, and cement-bentonite grout to the ground surface. A centralizer device may be used to keep the screen centered in the bedrock socket.

3.5 Bedrock Pumping and Rebound Evaluation

Following the installation of new bedrock wells and open borehole testing, submersible pumps will be deployed in the bedrock wells and pumped one at a time or in tandem to evaluate fracture connectivity, bedrock transmissivity, and uranium rebound. A decision whether to pump the wells in tandem or one at a time will depend on the yield of the newly installed wells, ability to manage pumped water and other logistics. For instance, if the yield is high, then it is likely that pumping from a single well will impact a sizeable area of the bedrock, which is desirable. If the yield is low, pumping at two wells simultaneously will likely be manageable in terms of generated water and will reduce the time to complete the hydraulic testing. Pumping at the wells may also be initiated sequentially, such as:

- Day 1 – Pumping initiated at BEW-1
- Day 3 – Pumping initiated at BEW-2 and BEW-1 continues pumping
- Day 6 – Pumping initiated at BEW-3, and BEW-1 and BEW-2 continue pumping

The purpose of the rebound evaluation is to observe changes in uranium concentrations in bedrock after removing an appreciable portion (approximately 5% to 10%) of impacted groundwater. The duration of required pumping from each well will be an important factor in determining if the rebound testing data will be sufficient to adequately evaluate the likely success of a pumping remedy. The specific components of the testing to gather hydraulic and water quality data to evaluate the feasibility of a pumping remedy are detailed in the sections below and include step testing, constant rate testing, hydraulic monitoring, and water quality testing. Water management and equipment decontamination plans are also presented.

3.5.1 Step Testing

Step testing will be conducted to select a pumping rate for long-term pumping. The step testing will entail pumping the well at multiple rates to evaluate a maximum safe yield for long-term pumping. A submersible pump, such as Grundfos SP-10S05-9 (0.5 HP motor) or equivalent, will be lowered into the well and suspended approximately 10 ft above the bottom of the well. A pressure transducer will be installed in a stilling well within the borehole to monitor the drawdown during step testing. The testing activities will follow SOP NMI-GW-017.

The testing will start at a low pumping rate (e.g., 0.5–1 gpm) followed by successively higher pump rates selected in the field based on the amount of drawdown observed at the first pumping step. It is anticipated that for each step the pump rate will be doubled (e.g., 1 gpm, 2 gpm, 4 gpm). At each pumping step, the pumping will continue until the drawdown stabilizes and quasi steady-state is achieved. A specific capacity for each pump rate will be estimated as flow rate (Q) divided by drawdown (s) (Q/s). The drawdown at each pumping rate will be calculated from the final drawdown measured at the end of the step. The drawdowns and pumping rates will be used to estimate the specific capacity of the well across a range of pumping rates and evaluate whether the specific capacity decreases at a specific pumping rate. Results will be evaluated to select a long-term rate for the constant test that is sustainable and efficient. If the specific capacity is shown to drop significantly at a particular flow rate, then the final selected rate should be lower than that rate.

3.5.2 Constant Rate Extraction Design and Monitoring

The sections below describe the basis for constant rate testing, and then procedures, data and analyses for the tests.

3.5.2.1 *Estimated Uranium Mass in Bedrock Groundwater*

The plume configuration inferred from data collected in November 2019 was used to estimate the uranium mass in bedrock groundwater. The area of each inferred groundwater concentration contour above the MCL (30, 50, and 70 µg/L) was calculated using Geographic Information Systems (GIS). The saturated thickness of the bedrock aquifer where the uranium is exceeding the MCL was assumed at 40 ft. The porosity of the fractured bedrock is not known; however, it is assumed that the porosity of the metamorphic bedrock ranges between 0.5% and 4%. The concentration of the areas bound by each contour was taken as the average of the two binding contours (e.g., a 40 µg/L concentration was assigned to the area between the 30 and 50 µg/L contours). The mass of uranium within the area bound by each contour was estimated by multiplying the area, saturated thickness (assumed at 40 ft), and average concentration by the aquifer pore volume estimated from bedrock porosities at 0.5% increments between 0.5% and 4%. The estimated mass of uranium and the aquifer pore volume are presented on Figure 3-5 and summarized below.

Assumed Bedrock Porosity	Total Aquifer Pore Volume (gallons)	Number of Fractionation Tank Volumes at 20,000 gallons each	Total Uranium Mass (g)	Days to Pump the Pore Volume at 9 gpm (3 gpm from each well)
0.5%	755,497	38	142	58
1.0%	1,510,995	76	285	117
1.5%	2,266,492	113	427	175
2.0%	3,021,989	151	569	233
2.5%	3,777,487	189	712	291
3.0%	4,532,984	227	854	350
3.5%	5,288,481	264	997	408
4.0%	6,043,978	302	1,139	466

Because the bedrock porosity is unknown and every 0.5% increase in porosity represents 750,000 gallons more water and two months of pumping, it is impossible to predict how long the pumping will need to be performed and how efficient the pumping will be at reducing the concentrations. The reduction of uranium concentrations will be evaluated based on data collected from monitoring wells and the concentrations in the extraction well effluent.

3.5.2.2 *Extraction Rate Estimates*

As described above, the extraction rate at each bedrock well will be selected based on the results from the step testing. A sustainable pumping rate for the open boreholes is difficult to estimate ahead of the well installation; however, for the purposes of this work plan, it is anticipated that each new bedrock well will be able to yield 1–3 gpm. The total volume generated from each well after seven days of pumping at these rates is estimated at 10,080 to 30,400 gallons, and the cumulative volume removed from the three wells after a week of pumping will be between 30,240 (1 gpm) and 90,720 (3 gpm) gallons. Each 0.5% of an assumed bedrock porosity represents an additional 750,000 gallons or 38 fractionation tanks so it is proposed that the pumping only continue for several weeks to several months depending on results.

3.5.2.3 *Means and Methods*

Pumping and flow control apparatus consisting of a submersible pump and flow meter, similar to that used for step testing, will be used for the long-term pumping. The pumps will be set in wells at the elevation coinciding with significant water-bearing fractures inferred from geophysical logging described in Section 3.4.6. If a significant water-bearing fracture was not identified during geophysical logging, the pump will be set to a depth where approximately 70% of the water column is above the pump to reduce the risk of the pump running dry. The setup and pumping procedures will follow SOP NMI-GW-018.

The discharge line from the pump will be equipped with the following:

- A backflow preventer (i.e., check valve)
- A mechanical or digital flow meter (Blue-White F-410N rotameter or equivalent)
- A mechanical or electronic totalizer (Neptune T-10 meter or equivalent)
- A globe or gate valve for flow adjustment
- A sampling port for water quality sampling.

Additionally, pressure transducers will be set in 1-inch PVC stilling wells installed within each of the extraction wells to monitor and log the water level during pumping. The purpose of the stilling wells will be to protect the pressure transducer and prevent entanglement of the pump feed wiring and discharge line with the transducer communication cables. Water extracted during pumping will be stored in fractionation tanks as described in Section 3.5.5 below.

For the first week of pumping, field technicians will monitor changes in the water level and specific capacity of each extraction well on a 24-hour schedule to eliminate the potential for the water level to drop below the pump intake (unless an automated system is used to monitor for pump faults and/or system malfunctions). Following a week of pumping on a 24-hour schedule, the team may select to continue pumping during working hours (e.g., 8 hours per day) and turn off the pumps during nonworking hours. The extended pumping will remove additional aquifer volume to help further evaluate the viability of a pumping remedy. The extracted groundwater will be pretreated for uranium via ion-exchange resins and then either transported to and treated at the NTCRA groundwater treatment plant, disposed of on-Site under EPA approval or transported for off-site disposal by an authorized treatment provider.

3.5.3 Hydraulic Monitoring

Approximately one week prior to the pumping, Geosyntec will deploy pressure transducers equipped with dataloggers in multiple monitoring wells shown on Figure 3-4 and listed in Table 3-2. The pressure transducers will be deployed to monitor background bedrock groundwater levels. Transducer installation will be documented using the Pressure Transducer Installation Log provided in Attachment B to this Appendix. The pressure transducers will be non-vented, and their data will be barometrically compensated using ambient air pressure data collected by a barometric pressure transducer (i.e., Barologger) deployed at the Site. The transducers will be set to record data at 5–10-minute intervals. All deployed transducers will be synchronized to take measurements simultaneously (e.g., all transducers record a measurement at 9:05:00AM, at 9:10:00AM, and every 5 minutes thereafter, if a 5-minute recording interval is programmed).

Immediately prior to the pumping, a round of manual depth-to-water measurements will be collected in wells instrumented with pressure transducers and additional bedrock wells in the area to document the pre-pumping groundwater heads. Precipitation will also be measured throughout the background monitoring period and the pump test using an on-site recording rain gauge (e.g., Onset bucket gage or equivalent) of data from a nearby weather station. During pumping, the field staff will collect manual water level measurements per SOP NMI-GW-009 in the wells instrumented with pressure transducers every 12 hours for comparison to the pressure transducer readings and as a means to evaluate and correct transducer drift (if any). A final round of manual water level measurements will be conducted at the end of the pumping period and before the pump is shut down; this gauging event will include the same wells gauged prior to the initiation of the test. The pressure transducers will continue recording data for at least a week after pumping ceases to capture the recovery period.

The pressure transducer data will be converted to drawdown relative to background conditions and groundwater elevation to evaluate the area of influence surrounding each bedrock extraction well. In addition, the data will be used to evaluate the direction and magnitude of hydraulic gradients under pumping conditions. A map showing the area of influence for each bedrock extraction well will be drafted to aid in evaluating a pumping remedy (if determined feasible) or in designing an injection remedy.

3.5.4 Water Quality Monitoring

The water quality of the extracted groundwater will be monitored during pumping. The water quality monitoring will entail measuring of field parameters (e.g., temperature, pH, dissolved oxygen, ORP, specific conductance, and turbidity), and collecting samples for analysis of 1,4-dioxane via Method 8270 SIM, and total uranium via Method 6020A ICP-MS. In addition, samples for metals exceeding the MCLs in the vicinity of the extraction wells will be collected as shown on Table 3.3.

Groundwater samples will be collected through a sampling port installed on the discharge piping prior to the totalizer and flow meter. The field parameters will be recorded at the beginning of pumping and every 6 hours until the end of the pumping period. Samples will be shipped to the laboratory under chain of custody (SOP NMI-001) for analysis of 1,4-dioxane and uranium will be collected at the beginning of pumping (baseline), and ½, 1, 2, 3, 4, 5, 7 days, and every 48 hours after 7 days until the pumping is terminated (Table 3-3). All samples will be analyzed for 1,4-dioxane, uranium and the other parameters listed in Table 3-3. The samples collected after pumping will be used to evaluate whether the change in concentrations during pumping persist. Data will be plotted and a trendline will be fit to the data (e.g., in Microsoft Excel) to assess changes/trends in concentration over time between the baseline concentrations and a time when natural gradients have returned following the pump test. These data will help to understand how uranium mass in bedrock can be mobilized toward the pumping wells and removed.

It is anticipated that approximately one day after the pumping is terminated, the water levels in the extraction well and the surrounding wells will recover to near pre-pumping levels. The recovery samples will be collected 1, 2, and 21 days following the termination of pumping. Additional recovery samples may be collected beyond 21 days if the pumping and post-pumping data suggest that longer-term monitoring would be beneficial to the rebound evaluation. The recovery samples will be collected using the submersible pump mounted in the extraction well, or a bladder pump lowered to the same depth where the submersible pump intake was set for the pumping test. If the submersible pump is used, the pump will be turned on for a sufficient period of time to flush two volumes of the piping and discharge hoses. The amount of time needed for the pump to remove the five piping volumes will be estimated in the field based on the flow rate and equipment.

3.5.5 Water Management

The groundwater generated as part of the pumping and rebound testing will be containerized into a series of fractionation tanks. It is assumed that a series of nine tanks will be required to store the water generated during pumping. This storage capacity should support approximately 9 gpm of pumping (cumulative from all wells) for approximately two weeks. The water stored in fractionation tanks will likely be periodically pumped into tanker trucks and transported off-site for disposal while the pumping is occurring. The water will be pretreated for uranium using resins as described in Section 3.4.5. The water from the testing will be sampled for the parameters listed in Section 3.4.5. Water management will be coordinated by *de maximis*. The water may be transferred to, treated, and disposed of through the NTCRA groundwater extraction system at certain intervals during the full bedrock pumping study or transported off-site for disposal.

3.5.6 Equipment Decontamination

Drilling equipment, including the drill rig, portable drilling mud tub, hoses, and cuttings tools, will be decontaminated between each well location and at the end of all drilling activities. The decontamination procedures will follow those presented in SOP NMI-007.

Geosyntec, in coordination with *de maximis* and Haley & Aldrich, will set up a decontamination pad on-site at an area that will not hinder other on-site activities. The decontamination pad will consist of a plastic-lined pad with elevated sides to contain decontamination fluids and will be wide enough to accommodate a drill rig. The pad will be constructed on a slightly sloped hard surface to withstand the weight of the drill rig. A sump pump will be placed on the lower side of the pad to transfer decontamination water into storage drums. The upper side will have an adjustable side/opening to allow the drill rig to drive in and out of the pad. A multi-step decontamination procedure will involve the following (see SOP NMI-007 for additional information):

1. Remove clods of soil from equipment using a shovel or trowel and place this soil into drums with soil IDW.
2. Remove residual soil and debris from drill rig and drilling tools with Alconox solution (using either scrub bush or pressurized water with an Alconox solution).
3. Run potable water with an Alconox solution through drill mud circulation hoses.
4. Rinse drill rig, tooling, and hoses with pressurized water.

Decontamination material, including washing fluids and mud from drilling tools, from each well location will be collected and transferred to 55-gallon drums or fractionation tanks and appropriately labeled pending laboratory analysis as outlined in Section 3.4.5. Additional wipe samples of the drill rig and tools will be collected at the end of all drilling activities for radiation screening before the drill rig is demobilized off-site. The wipe sampling will be performed by DDES, who is the Site Radiation Safety Officer (RSO), in coordination with *de maximis*.

Disposable sampling equipment and personal protection equipment (e.g., nitrile gloves) will be placed into 55-gallons drums for off-site disposal.

3.5.7 Hydraulic Data Analysis

Hydraulic data collected during the testing, including pressure transducers and manual water level measurements, will be analyzed to characterize the hydraulic conductivity of the bedrock aquifer as well as the bedrock fracture connectivity and pumping zone of influence as described below.

3.5.7.1 *Transmissivity*

The drawdown versus time data collected during pumping will be used to estimate bedrock transmissivity. The transmissivity will be estimated at monitoring wells instrumented with pressure transducers where a hydraulic response greater than 0.1 ft was observed during pumping. The data will be processed and input into an industry-standard aquifer test analysis software such as Aqtesolv©. The specific solution used to estimate transmissivity will be selected based on the shape of the drawdown curve, well construction, and assumed aquifer characteristics. The transmissivity of the open borehole wells will also be estimated using the drawdown in the extraction well. Plans depicting drawdown contours and directional transmissivity of fractures connecting the monitoring wells with the extraction wells will be drafted to show testing results.

3.5.7.2 *Fracture Connectivity and Pumping Zone of Influence*

The connectivity of the bedrock fractures across the bedrock plume will be evaluated using the hydraulic responses observed at surrounding monitoring wells. The fracture connectivity across the area will be evaluated to delineate a zone of influence (an area within which a measurable drawdown occurs at observation wells located around a pumping well) for each pumping well at the pump rates selected for testing. Groundwater potentiometric plans under pumping conditions will be drafted depicting the changes in hydraulic gradient and an estimate of the zone of influence from which groundwater is assumed to flow through fractures to the extraction well during pumping. Another plan will be developed that will show the combined zones of influence for each well to ascertain the maximum area of influence relative to the mapped bedrock uranium and 1,4-dioxane plumes under a combined pumping scenario using pumping wells installed for this PDI. As part of this evaluation, the capture zones (the area within which groundwater flow direction is to the pumping well) for each well may also be estimated and presented on plans. The fracture connectivity and zone of influence information will be critical for (1) understanding the viability of a short-term pumping remedy or (2) aiding in the design of a future amendment injection remedy if pumping is not a viable option for uranium and 1,4-dioxane in bedrock groundwater.

3.5.8 Uranium Rebound Analysis

3.5.8.1 *Baseline Concentrations*

The concentrations detected in the open borehole extraction wells at the beginning of pumping will be used as the baseline concentrations. Although the groundwater seepage velocity in bedrock is assumed to be very low, pumping is assumed to increase the seepage velocity by one or two orders of magnitude. Following pumping at the four open borehole wells, the project team will sample monitoring wells where a hydraulic response was observed during pumping and compare the post-pumping concentrations to the November 2019 results to evaluate whether there is an appreciable change in the concentrations and develop plans showing the post-pumping uranium distribution in groundwater. Estimates of the trend and magnitude of uranium and 1,4-dioxane mass removal from pumping relative to estimates of the total mass in bedrock groundwater will be attempted. These changes combined with the evaluation of zones of influence during pumping will form the basis of conclusions regarding the viability of a short-term pumping remedy.

The plans of pre- and post-pumping contaminant distribution will be used to evaluate whether the pumping from this PDI was able to result in a downward trending reduction in plume mass. These results may lead to a conclusion that additional pumping from other areas may be needed as further testing.

3.5.8.2 *Rebound Evaluation*

The samples collected after pumping will be used to evaluate whether the concentrations change during pumping persist. Data will be used to determine whether there is an observed change (e.g., fitting a trend line to a series of data and identifying a trend) in the uranium concentration between the baseline concentrations and a time when natural gradients have returned following the pump test. These data will help to understand how uranium mass in bedrock can be mobilized toward the pumping wells and removed by pumping.

3.6 Feasibility for Bedrock Groundwater Extraction Remedy

Analysis of data from this bedrock pumping and rebound will be targeted at determining if a pumping remedy for the uranium-impacted groundwater in bedrock is viable. Because the mass of uranium in bedrock groundwater is assumed to be finite (i.e., significant uranium concentrations above background are no longer being mobilized from bedrock into bedrock groundwater), it is possible that removing uranium by pumping will hydraulically facilitate attenuation of uranium concentrations to <30 μg/L. Results from this PDI will be used to assess what percentage of the total mass was removed during pumping and how much mass may be remaining in bedrock. Data will also be used to assess how much mass would be removed from bedrock if additional pumping was performed and whether uranium mass removal by pumping would decrease concentration to below the MCL in a reasonable time (e.g., 5 to 10 years). This time frame is used because it is similar to the anticipated time frame for the NTCRA groundwater extraction system to reduce the 1,4-dioxane concentrations below the ROD cleanup levels in the area west of the Assabet River. If the time frame of the pumping remedy for the uranium in bedrock significantly is unreasonable, then the project team may decide to pursue a stabilization remedy for uranium in bedrock.

4. PDI ISS-3: ISS PILOT TESTING IN OVERBURDEN

4.1 Introduction

The predesign investigation (PDI) for in situ stabilization (ISS) in overburden groundwater, referred to as PDI ISS-3, will evaluate injection methods for delivering sequestering reagents to uranium-impacted overburden outside of the Holding Basin (HB). The feasibility of ISS to achieve the remedial action objectives (RAOs) for depleted uranium (DU) in overburden groundwater was evaluated in the Feasibility Study (FS; *de maximis*, 2014). The DU plume in overburden groundwater is limited in extent and has a well-characterized source zone with relatively high concentrations of DU; therefore, ISS was the selected alternative for remediating DU in overburden groundwater. Based on a review of existing literature and Site data, multiple potential ISS reagents were identified to support the creation of in situ reactive zones that would not require in situ redox control of the groundwater. The RI/FS (*de maximis*, 2014) further identified the need for pilot testing in order to evaluate the appropriate ISS reagents, injection methods, and injection point spacing. This PDI will address the predesign needs identified in the RI/FS by conducting two pilot tests designed to evaluate the performance of multiple injection methods and ISS reagents. The implementation of PDI ISS-3 will be informed by the results of treatability studies (TSs) designed to evaluate the effectiveness of three reagents. A flow chart showing the integration of PDI ISS-3 with other elements of the RD is presented in Figure 1-1.

The results of PDI ISS-3 will be used to design a full-scale ISS remedy for overburden groundwater outside the HB. Additionally, results of the injection testing of solid phase reagents in saturated overburden will be used to design ISS for saturated soils beneath the HB.

4.2 Objectives

The objectives for the pilot testing described in this work plan are as follows:

- Evaluate the suitability of injection methods used for solid and/or liquid reagents, including horizontal ROI, reagent distribution with depth, predictability of reagent distribution, appropriate reagent concentration in injectate, and target injection volume per discrete depth interval.
- Evaluate the effectiveness of each emplaced reagent to reduce uranium concentrations in groundwater.

The results of this PDI will be used to select the appropriate combination(s) of reagent and injection method to be used for the full-scale RD for overburden groundwater.

The scope of work for this PDI is described in the following sections and includes installing monitoring wells, monitoring baseline groundwater conditions, conducting pilot test injections in two areas with different uranium concentrations using two different reagents and different injection methods, characterizing reagent distribution in each area, and monitoring changes in groundwater DU concentration after injection.

4.3 Evaluation of Treatability Study Results

As part of RD, three bench-scale TSs will be conducted to evaluate DU sequestration in each of the three media targeted for ISS (Figure 1-1). These TSs will include HB soils (TS ISS-1), overburden groundwater (TS ISS-2), and bedrock groundwater (TS ISS-3). The full scope and objectives of each of the three TSs are described in Appendix E of the RDWP. TS ISS-2 is designed to directly inform the implementation of PDI ISS-3 by identifying the preferred combination of ISS reagent(s) and dosing concentrations for ISS in overburden groundwater. Therefore, the activities in this PDI will be performed after TS ISS-2, since several components of this PDI will depend on the results of the TS. The objectives of the TS and the expected inputs for the final implementation of PDI ISS-3 with respect to the selection of ISS reagent and dose are briefly summarized in the sections below.

4.3.1 Selection of Reagents for ISS Pilot Tests

As described in Appendix E, TS ISS-2 will evaluate three reagents for ISS in overburden groundwater:

- Apatite II™
- Microscale zero-valent iron (mZVI)
- Sodium monophosphate (SMP)

Based on the results of TS ISS-2, up to two of these reagents will be retained for ISS pilot test injections in overburden groundwater outside the HB. Apatite II has been shown in previous evaluations at the Site to be effective in sequestering uranium and promoting the formation of low-solubility uranium mineral phases; therefore, it is anticipated that Apatite II will be used as one of the two pilot test reagents.

Injection methods will be chosen to match the selected ISS reagents because injecting a granular solid, such as Apatite II or mZVI, typically requires different injection methods than injecting a soluble reagent, such as SMP.

4.3.2 Selection of Reagent Dose for ISS Pilot Tests

The mass loading of ISS reagent(s) injected in PDI ISS-3 will be finalized based on the results of TS ISS-2. A factor of safety will be included in the final design for the pilot test to account for the effects of subsurface heterogeneity and incomplete mixing in comparison to the TSs. The pilot test injections presented in this work plan are designed to accommodate a range of reagent dosing and will be finalized prior to implementation as described below for each combination of reagent and injection method:

- For granular solid reagents (Section 4.4.3), the pilot test dose will be based on the quantity of reagent injected in each discrete depth interval.
- For soluble reagents (Section 4.4.4), the pilot test dose will be based on the concentration of reagent in the injectate.

4.4 Basis of Design

The portion of the Site where ISS of DU in overburden groundwater is planned has been characterized in previous Site investigations and is located generally in the area where total uranium concentrations in groundwater are above the maximum contaminant level (MCL) of 30 micrograms per liter (µg/L). Concentrations of total uranium in overburden groundwater samples from previous investigations are shown in Figure 2-5 along with estimated isoconcentration contours for total uranium during the most recent monitoring event in November 2019. Additional information on the distribution of uranium at the Site is provided in PDI ISS-1. The pilot tests described in this work plan will be conducted in a subset of this area. The basis of design for the ISS pilot tests is described in the sections below.

4.4.1 Site Hydrogeology and Conceptual Site Model for Depleted Uranium

The Site geology consists broadly of three geologic units—surficial stratified drift, glacial till, and bedrock. The stratified drift unit, which is the focus of PDI ISS-3, consists generally of sand and silty sand with some gravel. Overburden groundwater elevation contours in the vicinity of the ISS pilot test area are shown in Figure 4-1, and a cross section of the pilot test area along the approximate direction of groundwater flow is presented in Figure 2-6.

The primary source of DU to overburden groundwater at the Site is historical disposal in the HB. In overburden groundwater, DU migrates in the direction of groundwater flow to the northwest. In the vicinity of the HB, DU impacts in groundwater extend from the water table into the till, with the highest concentrations in the area around monitoring well MW-S24 at concentrations of approximately 3,000 µg/L. In the downgradient portion of the DU plume in overburden groundwater, DU impacts are generally confined to the shallower groundwater zones in the stratified drift. The rate of migration of DU in overburden groundwater is relatively slow due to natural sorption and/or sequestration of DU by the soil matrix. The limited extent of DU migration in overburden groundwater is demonstrated by groundwater samples indicating that DU has migrated approximately 400 feet (ft) from the downgradient edge of the HB over the last >50 years, as defined by the extent of detected DU concentrations above 30 µg/L.

4.4.2 Selection of Pilot Test Areas

In order to evaluate the effectiveness of ISS over a range of DU concentrations, ISS pilot test injections will be conducted in two areas: Pilot Test Area 1 and Pilot Test Area 2. Pilot Test Area 1 will be located in an area of higher uranium concentrations in overburden groundwater near MW-S24, where uranium concentrations are approximately 2,000 to 3,000 µg/L. Pilot Test Area 2 will be located farther downgradient in the vicinity of MW-8A, where uranium concentrations historically have been less than 1,000 µg/L. The two proposed pilot test areas are presented in Figure 4-1. In addition to evaluating the performance of ISS over a range of uranium concentrations, the two pilot test areas will be used to evaluate two different reagents and injection methods, as discussed in Sections 4.4.3 and 4.4.4.

In both pilot test areas, reagents will be injected into the saturated overburden between the water table and the top of till. Due to the substantially higher concentrations of uranium observed in the stratified drift and the higher hydraulic conductivity of the sand and gravel layers in this unit, the stratified drift contains the majority of the uranium mass in overburden groundwater and an even larger component of the mass flux of uranium in groundwater relative to the till layer. Therefore, the stratified drift is the appropriate zone in which to target ISS of DU, rather than the till, which is not likely to be a significant migration pathway for DU.

4.4.3 Pilot Test Area 1 Design

In Pilot Test Area 1, a granular solid reagent will be injected at three locations as a viscous slurry using direct-push technology (DPT) jet injection methods. The injection methods, injection point layout, and treatment depth intervals for Pilot Test Area 1 are discussed in the sections below.

4.4.3.1 *Injection Method for Solid Reagents*

DPT jet injection combines high-pressure jetting and hydraulic fracturing using specialized dual-fluid injection tooling. The DPT jet injection method and associated injection tooling were developed by FRx, Inc. and Geosyntec to deliver reagents into controlled horizontal hydraulic fractures. This method was selected for the PDI to distribute the reagent into lenses created throughout the pilot test treatment zone. The solid reagent will be suspended in a viscous carrier fluid consisting of a cross-linked guar gel or similar carrier fluid. Viscous slurry injection using these methods is governed by soil mechanics rather than Darcy flow because the slurry is delivered to the subsurface by fracturing the soil rather than relying on flow through soil pore spaces. The injected slurry will include sand as a proppant to keep fractures open after injection and provide a permeable zone where groundwater flowing through the pilot test area will migrate. Groundwater migrating through lenses will come into contact with the ISS reagent thereby sequestering the uranium. A conceptual cross-section of ISS reagent lenses emplaced using DPT jet injection is presented in Figure 4-2. The process for implementing DPT jet injection is described in Section 4.5.2.

4.4.3.2 *Injection Layout and ROIs*

Injections of a granular solid reagent (either mZVI or Apatite II) will be conducted at three locations with a target ROI of 15 ft. The ROI for injection of solid-phase amendments is controlled by the extent of the fractures created during injection. A 15-ft target ROI was selected for the pilot test injections based on the extent of lenses typically achieved using DPT jet injection methods. The injection locations are oriented such that the ROIs of adjacent points overlap, thereby promoting distribution of amendments throughout the target treatment area. Injection locations for the granular solid reagent (IP-1-1, IP-1-2, and IP-1-3) are shown in Figure 4-3.

The injection layout for the pilot test is designed to accommodate a mass loading of granular solid reagent of up to 1.5% (on the basis of mass reagent per mass dry soil). A mass loading greater than 1.5% is not expected to be needed based on the results of the FS[6]. If the results of TS ISS-2 suggest

[6] The capacity of Apatite II to sequester DU from Site groundwater was evaluated in the FS. Based on the observed concentration of DU sequestered on Apatite II, a mass loading of 1.5% is expected to be sufficient to sequester the mass of DU in groundwater in the pilot test treatment area.

that a higher mass loading of the selected reagent is needed to promote ISS, then the injection design will be adjusted for the higher mass loading before implementing the pilot test.

4.4.3.3 *Depth Intervals*

At each location, injections will be conducted at multiple depths to distribute reagent throughout the pilot test treatment zone. Treatment depth intervals were selected for the pilot test to target the zone of higher uranium concentrations in overburden groundwater. Injection depths will span from just below the water table to the top of till, which corresponds to approximately 50 to 80 feet below ground surface (ft bgs) in Pilot Test Area 1. A vertical spacing of 3 ft was selected for discrete depth injections, with discrete injections at adjacent locations offset vertically (Figure 4-2). The depth intervals targeted for pilot test injections of granular solid reagent are specified in Table 4-1.

4.4.4 Pilot Test Area 2 Design

In Pilot Test Area 2, it is anticipated that SMP will be injected at three locations as a solution with potable water using direct-push tooling. The injection methods, injection point layout, and treatment depth intervals for Pilot Test Area 2 are discussed in the sections below.

4.4.4.1 *Injection Method for Soluble Reagents*

Due to the relatively high hydraulic conductivity of the stratified drift soils in this area and the low viscosity of SMP solution, a fracturing approach is not planned for injecting the soluble reagent in Pilot Test Area 2. The process for injecting a soluble reagent using direct-push tooling is described in Section 4.5.2. If the results of bench-scale treatability testing strongly favor mZVI or Apatite II over SMP, then the injection approach for Pilot Test Area 2 may be revised prior to implementation to use a different reagent and injection method.

4.4.4.2 *Injection Layout and ROIs*

In Pilot Test Area 2, soluble reagent will be injected at three locations upgradient from existing monitoring well MW-8A. This pilot test is designed to evaluate a different ROI for soluble reagents at each of the three injection locations. Injections will be conducted with target ROIs of 10, 15, and 20 ft; the layout of the injection locations and target ROIs is presented in Figure 4-3. The ROI for injection of soluble reagent is a function of the volume of injectate and the effective porosity of the soil. Typically, it is assumed that only a portion of the pore volume is displaced by the injected fluid. The actual volume of injectate needed to achieve the target ROIs will be evaluated in the field as part of the injection process as discussed in Section 4.5.2. The injection volumes specified for Pilot Test Area 2 are based on a total porosity of 30% and include a minimum and maximum injectate volume for each injection location, which correspond to 15% and 30% of the pore volume, respectively (Table 4-2). The process for selecting and adjusting injection volumes during the pilot test is described in Section 4.5.2.

4.4.4.3 *Depth Intervals*

At each location, injection depths will span from just below the water table to the top of till, which corresponds to approximately 57 to 87 ft bgs in Pilot Test Area 2. Injection of soluble reagent will start at the water table and move down in intervals of 5 ft or less until they reach till. This approach is used to promote uniform distribution over the treatment zone and limit the likelihood of shortcircuiting into more permeable zones. The depth intervals targeted for pilot test injections of soluble reagent are specified in Table 4-2.

4.5 Field Implementation Sequence for PDI ISS-2

The steps for completing the PDI scope of work include installation of monitoring wells, baseline groundwater sampling, pilot test injections, post-injection soil borings, and post-injection groundwater performance monitoring. These activities are described in the subsections below.

4.5.1 Monitoring Well Installation and Baseline Groundwater Sampling

Additional monitoring wells will be installed in and around the pilot test areas before injections to provide baseline and post-injection performance monitoring. The performance monitoring well network for this PDI includes 15 wells, including 5 existing wells and 10 proposed wells. The performance monitoring wells were selected to include wells located upgradient from, within, and downgradient from each of the two pilot test areas. The locations of the existing and proposed performance monitoring wells are shown in Figure 4-3. Eight of the new wells will be installed as shallow/deep couplets, with one well in shallow saturated stratified drift and a second well in deep stratified drift (MW-S60 and MW-SD60; MW-S62 and MW-SD62; MW-S63 and MW-SD63; and MW-S64 and MW-SD64). Two of the new wells will be installed in deep stratified drift near existing shallow wells to create shallow/deep couplets (MW-S24 and MW-SD24; MW-8A and MW-SD61).

The ten new monitoring wells (four shallow and six deep) will be installed in the stratified drift using sonic drilling methods as outlined in SOPs NMI-S-004 and NMI-GW-003 with equipment decontamination between locations (see SOP NMI-007). The four new shallow wells are expected to be screened in the top 15 ft of the saturated overburden, while the six new deep wells are expected to be screened in the lower 10 to 15 ft of stratified drift above the top of till. Estimated installation depths for the new monitoring wells are listed in Table 4-3. Continuous soil cores will be collected and logged during the installation of these wells in accordance with SOP NMI-S-006, and geologic logging of soil cores will be used to inform the selected depth for the well screen at each location. The ten new monitoring wells will be developed at least 72 hours after installation using the procedures outlined in SOP NMI-GW-002.

During monitoring well installation, bulk soil samples will be collected from saturated overburden for use in TS ISS-2. Samples will be collected from the top 20 ft of saturated overburden at MW-SD60 (approximately 50 to 70 ft bgs) according to the procedures described in Appendix E of the RDWP. As shown in Figures 2-5 and 2-6, this location and depth interval were selected to obtain soil samples for TS ISS-2 that are representative of the area with high detected concentrations of uranium in overburden groundwater (i.e., within the area of concentrations greater than 1,000 µg/L).

After the new monitoring wells are installed and developed, they will be surveyed according to SOP NMI-009. Next, baseline groundwater samples will be collected from the ten new wells. Baseline groundwater samples will also be collected at five existing monitoring wells within the vicinity of the pilot test areas (HB-PZ2R, MW-S02, MW-8A, MW-S16, and MW-S24). Baseline groundwater samples will be collected with bladder pumps using low-flow methods. Low-flow groundwater sampling procedures are provided in SOPs NMI-002, NMI-003 and NMI-GW-010. Groundwater samples will be analyzed for total and dissolved metals (uranium, calcium, and iron), nitrate, nitrite, total phosphorus, and field geochemical parameters (see QAPP for laboratory procedures). At a subset of wells, samples will also be analyzed for baseline concentrations of fluorescent tracers to support ROI assessment (Section 4.5.2). The sampling plan for baseline groundwater monitoring is presented in Table 4-3. Sample handling and decontamination procedures to be used during this event are provided in SOPs NMI-001 and 007, respectively. Purge water from this event will be managed by de maximis per SOP NMI-005.

4.5.2 ISS Pilot Test Injections

As described in Section 4.4, ISS pilot test injections will be conducted in two distinct pilot test areas using different injection methods: one pilot test will be conducted using a granular solid reagent in groundwater with higher DU concentrations (Pilot Test Area 1), and a second pilot test will use a soluble reagent in groundwater with lower DU concentrations (Pilot Test Area 2). The process for conducting each of the ISS pilot tests is described in the subsections below.

4.5.2.1 *ISS Pilot Test Area 1*

In Pilot Test Area 1, a granular solid reagent will be delivered to the subsurface by injecting a viscous slurry using DPT jet injection. The slurry will be composed of a mixture of sand and the selected granular solid ISS reagent suspended in a cross-linked, hydrated guar gum slurry (or similar carrier fluid). Prior to injection, hydrated guar gum will be prepared by mixing guar gum and water. Sand and the selected ISS reagent will then be mixed with the hydrated guar gum, which will be cross-linked using borax. The addition of the borax will form guar gel, creating a viscous slurry to suspend the solid reagent thereby promoting delivery and limiting aggregation of solids within the aquifer matrix. An enzymatic breaker (e.g., Rantec LEB-H™ or similar) also will be added to the slurry prior to injection at a concentration based on the manufacturer's instructions. The enzymatic breaker will break down the guar gel after the slurry is injected to increase the permeability of the reagent-filled fractures. Colored sand or tracer dye will be added to the reagent slurry so that the injection ROI can be evaluated using soil borings, as described in Section 4.5.3. A different color of sand or dye will be used for each of the three injection locations to support ROI assessment in areas where the ROIs of two or more injection locations may overlap. Potable water will be used for all injections.

At each location, the slurry will be injected at discrete depths over the treatment interval specified in Table 4-1, with a spacing of 3 vertical feet between discrete injection depths. Injections will start at the top of the target treatment interval and progress downward until injections have been completed over the depth range specified in Table 4-1. As discussed in Section 4.3.2, the selection of reagent and the design mass loading of reagent will be evaluated based on the results of TS ISS-2. The quantity of reagent to be injected at each discrete depth is therefore not specified in Table 4-1, but will be selected to achieve the target mass loading (on a basis of mass reagent per mass dry soil).

DPT jet injection for delivery to the subsurface will consist of the following steps for a single discrete injection depth.

1. A DPT rig will be used to advance specialized dual-fluid injection tooling into the subsurface to the first target injection depth; injections will be performed using a top-down approach (i.e., starting at the water table and advancing downward to till).
2. A viscous slurry composed of potable water, guar gel, enzymatic breaker, sand, and the selected reagent (Apatite II or mZVI) will be mixed just prior to the start of injection at each depth interval.
3. After injection tooling is advanced to depth, high-pressure water jetting (approximately 10,000 pounds per square inch [psi]) will be used to erode a horizontal disc shape in the formation surrounding the injection tooling.
4. After the water jetting step is complete, a cross-linked guar gel slurry containing the design quantity of the selected reagent will be injected under sufficient pressures (i.e., 150 to 600 psi) to create amendment-filled horizontal fractures with a target ROI of 15 ft.
5. After the target volume of slurry has been injected, the tooling will be advanced to the next injection interval or retracted after the deepest injection interval is completed.
6. After all injections at each location are complete and the injection tooling is removed, the boreholes will be grouted with a cement-bentonite grout to the surface.

The ground surface and nearby wells will be monitored visually for breakthrough of the injection slurry during the injection process. If breakthrough occurs, then injection at the current depth interval will cease, and any remaining quantity of slurry targeted for that interval will be added at the next vertical interval or at a nearby location. If field observations during the pilot test indicate that injection of the target volume of slurry is not feasible, then the following modifications to the pilot test injection program may be evaluated in the field:

- Increasing or decreasing the vertical spacing between discrete injection depth intervals
- Advancing injection tooling at additional step-out locations within Pilot Test Area 1 to complete supplemental injections

After Pilot Test Area 1 injections are complete, the ROI of granular solid reagent injections in Pilot Test Area 1 will be evaluated using post-injection characterization borings as described in Section 4.5.3.

4.5.2.2 *ISS Pilot Test Area 2*

In Pilot Test Area 2, a solution containing SMP and potable water will be injected at low to moderate pressures (i.e., below approximately 40 psi) using direct-push injection tooling. Injections will be performed at the locations shown in Figure 4-3 using top-down methods with a maximum screen length of 5 ft. The target volume of soluble reagent solution varies between injection locations in order to evaluate the feasibility of achieving various ROIs. The target volume of injectate per linear foot of injection screen for each of the three injection locations is presented in Table 4-2. The concentration of SMP in the injected solution will be selected based on the results of TS ISS-2 and is therefore not specified in Table 4-2.

Fluorescent dye tracers will be added to the injection solution to use as part of the injection ROI assessment. A different tracer will be used for each of the three injection locations in order to distinguish between the location in areas where ROIs overlap; the tracers selected for the PDI include fluorescein, eosin, and rhodamine WT. Tracer dye will be added to the injectate for each location at a concentration between approximately 3 parts per million (ppm) and 30 ppm.

The ROI of soluble reagent injections in Pilot Test Area 2 will be evaluated using measurements and observations at nearby monitoring wells during injections. Multiple lines of evidence - including measurement of water levels and specific conductance, field testing for fluorescent tracer dyes, and laboratory analysis for fluorescent tracer dyes—will be used to support the ROI evaluation. Prior to the start of injections, datalogging pressure transducers with specific conductivity probes will be placed in each of the four monitoring wells within Pilot Test Area 2 (MW-S62, MW-SD62, MW-S63, and MW-SD63) to understand water level changes and detect the presence of injectate as material is added into the subsurface. Water levels will also be measured manually per SOP NMI-GW-009. Injections will be conducted at the three injection locations in the order of increasing ROI (i.e., starting with location IP-2-1). At each injection location, the process below will be used to evaluate the ROI during injection:

1. At the first (i.e., shallowest) injection interval, the maximum target injectate volume for that interval (based on 30% pore volume displacement) will be injected using the volume per linear foot specified in Table 4-2.
2. Grab samples will be collected from each of the four monitoring wells using submersible pumps after injecting approximately half the target volume at the first interval and again after injecting the full volume. At each well, the samples will be collected from the portion of the well screen closest to the depth of the active injection. If the active injection depth is above or below the screen depth for a given well, the sample will be collected from within the top or bottom 2 ft of the well screen, respectively. The fluorescent dye concentrations in each sample will be measured using a handheld fluorometer (AquaFluor® or similar) as described in SOP NMI-GW-20. A sample will also be collected for laboratory analysis of tracer dyes.
3. If the dye tracer is detected in the handheld fluorometer sample(s) collected after injecting approximately half the injectate volume, then the volume for subsequent depth intervals at that injection location may be decreased. However, the volume will not be decreased below the minimum target injection volume per linear foot specified for that location in Table 4-2 (based on 15% pore volume displacement).
4. The injection tooling will be advanced to the next injection depth interval, and the target volume will be injected. The sampling described in steps 2 and 3 will be repeated for each subsequent injection interval. The depths of submersible pumps will be adjusted prior to sampling to target the appropriate sample depth as described in step 2.
5. After completing the deepest injection interval at a location, the injection tooling will be removed, and the location will be grouted with a cement-bentonite grout (using a tremie pipe) to the ground surface.

The concentration of the dye in the injected solution may be adjusted if field observations indicate that a higher or lower concentration is needed. After completing injections at each of the three locations in Pilot Test Area 2, a subset of the water samples collected will be selected for submission to the laboratory for analysis of tracer dye based on the results of field screening. Samples will be analyzed for all three tracer dyes injected in Pilot Test Area 2. At a minimum, the samples selected for laboratory analysis will include the following:

- Samples collected from MW-S62 and MW-S63 after finishing the deepest injection shallower than 72 ft bgs at each of the three injection locations
- Samples collected from MW-SD62 and MW-SD63 after finishing the deepest injection at each of the three injection locations

During injections, the ground surface and nearby wells will be periodically monitored visually for surficial breakthrough of the soluble reagent solution. If breakthrough occurs, then injection at the current depth interval will cease and any remaining quantity of injectate targeted for that interval will be added at the next vertical interval or at a nearby location.

4.5.3 Post-Injection Characterization Soil Borings

Once the reagent injections are completed in Pilot Test Area 1, soil borings will be advanced to characterize the distribution of the injected reagent slurry in the subsurface. These borings will provide data to estimate the ROI and distribution with depth of the ISS reagent delivered to the pilot test area by DPT jet injection methods. Nine post-injection characterization soil borings will be advanced. Three borings will be distributed around each of the three injection locations at distances of approximately 7, 11, and 15 ft from the injection point. The locations of post-injection soil borings will be selected in the field, and distances of borings from the injection locations will be reviewed and may be adjusted based on the results of previous borings to more accurately characterize the ROI. Boring locations will also be adjusted to accommodate access. In areas where the ROI of two or more injections overlap, reagent slurry from more than one injection location may be observed in soil borings. A different color sand will be used at each injection location, as described above, to facilitate determining the location where the reagent slurry was injected.

Post-injection characterization borings will be advanced using direct-push methods in accordance with SOP NMI-S-004. Continuous cores will be collected between approximately 10 ft above the estimated water table and the shallower of 4 ft below the deepest reagent injection depth or the top of till. Soil cores will be logged for geology in accordance with SOP NMI-S-006 and visually inspected for the presence of colored sand (indicating reagent placement). The results of the post-injection characterization borings will be used to assess the ROIs achieved by DPT jet injection and to inform the ROI for the full-scale RD.

4.5.4 Groundwater Performance Monitoring

After the pilot test injections in both areas are complete, groundwater will be monitored to assess the effects of the ISS Pilot Test on uranium concentrations in overburden groundwater. As described above in Section 4.5.1, the performance monitoring well network consists of wells screened in overburden above the till to evaluate uranium concentrations in groundwater migrating through the more permeable overburden units. Groundwater will be monitored at 15 wells one, two, and four months after injection. The locations of post-injection performance monitoring wells are shown in Figure 4-3, and a sampling plan is provided in Table 4-3.

Wells will be sampled using low-flow methods (SOP NMI-GW-010), and samples will be analyzed for total and dissolved metals (uranium, iron, and calcium) total phosphorus, nitrate, fluorescent tracer dyes, and field geochemistry parameters using the methods described in the QAPP. Samples will be shipped under chain-of-custody procedures (SOP NMI-001) and sampling equipment will be decontaminated between locations in accordance with SOP NMI-007.

4.5.5 IDW Management

Decontamination fluids (see SOP NMI-007) and investigation-derived waste (IDW) generated during the pilot test is expected to include the following materials:

- Soil cuttings from installing monitoring wells and post-injection characterization borings
- Groundwater removed while developing new monitoring wells
- Soil and water generated during the jetting phase of jet injection
- Water generated while decontaminating drilling and injection tooling

IDW will be managed by de maximis in accordance with SOP NMI-005.

4.6 Reporting

The status of this PDI and available data from the testing, will be provided to USEPA during routine project meetings and in status reports. Results of the PDI will be incorporated into a PDI Report and/or the 30% RD report. Specifically, the results of the ISS pilot testing will generate the following design inputs for the full-scale remedy:

- Injection ROI for solid- and liquid-phase reagents
- Feasibility of reagent delivery using DPT injection methods and recommended pressures and flow rates
- Injection volume per discrete depth interval
- Preliminary data about the effectiveness of ISS (based on post-injection groundwater monitoring).

4.7 Schedule

The components of PDI ISS-2 will be scheduled in sequence with other PDI activities at the Site. Installation of monitoring wells for PDI ISS-2 and collection of soil for TS ISS-2 is expected to begin within one month of USEPA approval of the RDWP. After TS ISS-2 is completed, the pilot test design will be finalized as described in Section 4.4. The duration of field activities associated with the pilot test injections and post-injection characterization borings is expected to be approximately four weeks. Post-injection groundwater monitoring will start one month after injection activities are completed and is expected to continue until four months after injections.

5. PDI ISS-4: ISS PILOT TESTING IN BEDROCK

PDI-ISS-4 will investigate the feasibility of delivering ISS amendments into bedrock and the effectiveness of these amendments at decreasing uranium concentration in bedrock. The scope for PDI-ISS-4 will be developed if results from PDI-ISS-2 show that pumping is an ineffective remedy for reducing uranium concentrations in bedrock and that amendments can feasibly be delivered through wells screened in bedrock. If ISS in bedrock is pursued, then it will occur subsequent to treatability testing (i.e., TS ISS-3) to determine the appropriate reagent (likely SMP) and dose for use in bedrock. Treatability testing would then be followed by pilot testing (as PDI ISS-4) of the selected reagent in bedrock.

6. REFERENCES

de maximis, Geosyntec Consultants, and Haley & Aldrich, 2014 *Remedial Investigation, Nuclear Metals, Inc. Superfund Site, Concord, MA*, October.

de maximis, Geosyntec Consultants, and Haley & Aldrich, 2014 Feasibility Study Report, *Nuclear Metals, Inc. Superfund Site, Concord, MA,* November.GeoTrans. 2002. *Draft Remedial Investigation Report, Operable Unit Three, W.R. Grace Superfund Site, Acton, Massachusetts*. GeoTrans, Inc. August 30.

Walsh, G.J. 2001. *Bedrock Geology in the Vicinity of the Rockland Avenue Well Site, Maynard, Massachusetts*. U.S. Geological Survey Open File Report.

Geosyntec. 2015. *Groundwater Investigation Work Plan, Nuclear Metals Superfund Site.*

Geosyntec. 2016. *Extraction Well Installation and Pump Test Work Plan, Nuclear Metals Superfund Site.* June 21.

Geosyntec. 2017a. *Pre-Design Investigation Report, Nuclear Metals Superfund Site*. April 3.

Geosyntec. 2017b. *100% Removal Design Report, Temporary Treatment System, Nuclear Metals Superfund Site.* January 25.

Tables

Well ID	Field Parameters	VOCs	1,4-dioxane	SVOCs	U-Total U^{235} / U^{238} and Th Th^{232}	Total and Dissolved Metals	Nitrate / Nitrite	PFAS	Geochemistry Parameters					
									Total Phosphorous	Ortho-phosphate	Dissolved Organic Carbon	Total and Dissolved Cations (As, Fe, Mn, Ca, Mg, Na, K)	Anions ($S0_4^{2-}$, F^-, Cl^-)	Alkalinity (Carb/ Bicarb)
		Method 8260	Method 8270D SIM	Method 8270	Method 6020A ICP-MS	Method 6020A ICP-MS	Method 353.2	Method 537 1.1 I.D.	Method 365.1	Method SMP4500P-E	Method 9060	Method 6020A ICP-MS	Method 300	Method 310.1
ASSABET-1A	X	X	X	X	X	X	X	X						
ASSABET-2A	X	X	X	X	X	X	X	X						
EW-1	X	X	X	X	X	X	X	X						
GZW-10-1	X	X	X	X	X	X	X							
GZW-10-2	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GZW-11-2	X	X	X	X	X	X	X							
GZW-6-1	X	X	X	X	X	X	X							
GZW-7-1	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GZW-7-2	X	X	X	X	X	X	X	X	X	X	X	X	X	X
GZW-7S	X	X	X	X	X	X	X		X	X	X	X	X	X
GZW-8-1	X	X	X	X	X	X	X							
GZW-8-2	X	X	X	X	X	X	X							
GZW-9-1	X	X	X	X	X	X	X							
GZW-9-2	X	X	X	X	X	X	X							
HA-09	X	X	X	X	X	X	X							
HA-11	X	X	X	X	X	X	X							
HB-10	X	X	X	X	X	X	X	X						
HB-10S	X	X	X	X	X	X	X							
HB-11	X	X	X	X	X	X	X							
HB-12	X	X	X	X	X	X	X		X	X	X	X	X	X
HB-620	X	X	X	X	X	X	X							
HBPZ-2R	X	X	X	X	X	X	X		X	X	X	X	X	X
ML-1-1	X	X	X	X	X	X	X							
ML-1-2	X	X	X	X	X	X	X							
ML-1-3	X	X	X	X	X	X	X							
ML-3-1	X	X	X	X	X	X	X							
ML-3-3	X	X	X	X	X	X	X							
MW-1	X	X	X	X	X	X	X	X						
MW-2	X	X	X	X	X	X	X							
MW-8A	X	X	X	X	X	X	X		X	X	X	X	X	X
MW-BM03	X	X	X	X	X	X	X	X						
MW-BM15	X	X	X	X	X	X	X	X						
MW-BS01	X	X	X	X	X	X	X							
MW-BS02	X	X	X	X	X	X	X		X	X	X	X	X	X
MW-BS03	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-BS04	X	X	X	X	X	X	X							
MW-BS10	X	X	X	X	X	X	X		X	X	X	X	X	X
MW-BS12	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-BS13	X	X	X	X	X	X	X							
MW-BS14	X	X	X	X	X	X	X							
MW-BS15	X	X	X	X	X	X	X	X						
MW-BS17	X	X	X	X	X	X	X							
MW-BS21	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-BS22	X	X	X	X	X	X	X							
MW-BS25	X	X	X	X	X	X	X							
MW-BS26	X	X	X	X	X	X	X							
MW-BS28	X	X	X	X	X	X	X		X	X	X	X	X	X

Table 2-1. Sitewider Sampling Plan - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

Well ID	Field Parameters	VOCs	1,4-dioxane	SVOCs	U-Total U^{235} / U^{238} and Th Th^{232}	Total and Dissolved Metals	Nitrate / Nitrite	PFAS	Geochemistry Parameters: Total Phosphorous	Geochemistry Parameters: Ortho-phosphate	Geochemistry Parameters: Dissolved Organic Carbon	Geochemistry Parameters: Total and Dissolved Cations (As, Fe, Mn, Ca, Mg, Na, K)	Geochemistry Parameters: Anions (SO_4^{2-}, F^-, Cl^-)	Geochemistry Parameters: Alkalinity (Carb/ Bicarb)
		Method 8260	Method 8270D SIM	Method 8270	Method 6020A ICP-MS	Method 6020A ICP-MS	Method 353.2	Method 537 1.1 I.D.	Method 365.1	Method SMP4500P-E	Method 9060	Method 6020A ICP-MS	Method 300	Method 310.1
MW-BS31	X	X	X	X	X	X	X							
MW-BS32	X	X	X	X	X	X	X							
MW-BS34	X	X	X	X	X	X	X	X						
MW-BS35	X	X	X	X	X	X	X							
MW-BS36	X	X	X	X	X	X	X							
MW-BS37	X	X	X	X	X	X	X							
MW-BS38	X	X	X	X	X	X	X							
MW-BS39	X	X	X	X	X	X	X							
MW-BS40	X	X	X	X	X	X	X							
MW-BS46	X	X	X	X	X	X	X							
MW-S01	X	X	X	X	X	X	X		X	X	X	X	X	X
MW-S02	X	X	X	X	X	X	X		X	X	X	X	X	X
MW-S03	X	X	X	X	X	X	X							
MW-S04	X	X	X	X	X	X	X							
MW-S06	X	X	X	X	X	X	X	X						
MW-S07	X	X	X	X	X	X	X							
MW-S08	X	X	X	X	X	X	X							
MW-S09	X	X	X	X	X	X	X							
MW-S11	X	X	X	X	X	X	X							
MW-S12	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-S14	X	X	X	X	X	X	X							
MW-S15	X	X	X	X	X	X	X	X						
MW-S16	X	X	X	X	X	X	X		X	X	X	X	X	X
MW-S17	X	X	X	X	X	X	X							
MW-S18	X	X	X	X	X	X	X							
MW-S19	X	X	X	X	X	X	X							
MW-S20	X	X	X	X	X	X	X							
MW-S21	X	X	X	X	X	X	X	X	X	X	X	X	X	X
MW-S22	X	X	X	X	X	X	X							
MW-S23	X	X	X	X	X	X	X							
MW-S24	X	X	X	X	X	X	X		X	X	X	X	X	X
MW-S26	X	X	X	X	X	X	X							
MW-S27	X	X	X	X	X	X	X	X						
MW-S28	X	X	X	X	X	X	X							
MW-S29	X	X	X	X	X	X	X							
MW-S30	X	X	X	X	X	X	X	X						
MW-S32	X	X	X	X	X	X	X							
MW-S35	X	X	X	X	X	X	X							
MW-S36	X	X	X	X	X	X	X							
MW-S37	X	X	X	X	X	X	X							
MW-S38	X	X	X	X	X	X	X							
MW-S39	X	X	X	X	X	X	X							
MW-S40	X	X	X	X	X	X	X							
MW-SD01	X	X	X	X	X	X	X		X	X	X	X	X	X
MW-SD02	X	X	X	X	X	X	X		X	X	X	X	X	X
MW-SD06	X	X	X	X	X	X	X							
MW-SD10	X	X	X	X	X	X	X							

Table 2-1. Sitewider Sampling Plan - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

									Geochemistry Parameters					
Well ID	Field Parameters	VOCs	1,4-dioxane	SVOCs	U-Total U^{235} / U^{238} and Th Th^{232}	Total and Dissolved Metals	Nitrate / Nitrite	PFAS	Total Phosphorous	Ortho-phosphate	Dissolved Organic Carbon	Total and Dissolved Cations (As, Fe, Mn, Ca, Mg, Na, K)	Anions $(S0_4^{2-}, F^-, Cl^-)$	Alkalinity (Carb/ Bicarb)
		Method 8260	Method 8270D SIM	Method 8270	Method 6020A ICP-MS	Method 6020A ICP-MS	Method 353.2	Method 537 1.1 I.D.	Method 365.1	Method SMP4500P-E	Method 9060	Method 6020A ICP-MS	Method 300	Method 310.1
MW-SD13	X	X	X	X	X	X	X							
MW-SD17	X	X	X	X	X	X	X							
MW-SD26	X	X	X	X	X	X	X							
MW-SD27	X	X	X	X	X	X	X							
MW-SD29	X	X	X	X	X	X	X							
MW-SD30	X	X	X	X	X	X	X							
MW-SD32	X	X	X	X	X	X	X							
MW-SD34	X	X	X	X	X	X	X	X						
MW-SD35	X	X	X	X	X	X	X							
MW-SD36	X	X	X	X	X	X	X							
MW-SD37	X	X	X	X	X	X	X							
MW-SD38	X	X	X	X	X	X	X							
MW-SD39	X	X	X	X	X	X	X							
MW-SD40	X	X	X	X	X	X	X							
MW-SD41	X	X	X	X	X	X	X							
MW-SD42A	X	X	X	X	X	X	X							
MW-SD43	X	X	X	X	X	X	X							
MW-SD44	X	X	X	X	X	X	X							
MW-SD45	X	X	X	X	X	X	X							
MW-SD46	X	X	X	X	X	X	X							
MW-SM13	X	X	X	X	X	X	X							
MW-SM46	X	X	X	X	X	X	X							
MW-T10	X	X	X	X	X	X	X							
MW-T24	X	X	X	X	X	X	X							
OW-2	X	X	X	X	X	X	X							
OW-3	X	X	X	X	X	X	X							
P-1	X	X	X	X	X	X	X							
P-1A	X	X	X	X	X	X	X							
P-2	X	X	X	X	X	X	X							
P-3	X	X	X	X	X	X	X							
P-4	X	X	X	X	X	X	X							
PT-09	X	X	X	X	X	X	X							
PT-11P	X	X	X	X	X	X	X							
PW-6	X	X	X	X	X	X	X							
SW-1	X	X	X	X	X	X	X							
SW-2A	X	X	X	X	X	X	X							
Total	130	130	130	130	130	130	130	22	21	21	21	21	21	21
Duplicates		13	13	13	13	13	13	2	2	2	2	2	2	2
Trip Blanks		10												
Equipment Blanks		13	13	13	13	13	13	2	2	2	2	2	2	2
MS/MSD		9	9	9	9	1	9	1	1	1	1	1	1	1

Table 2-1. Sitewider Sampling Plan - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

Well ID	Field Parameters	VOCs	1,4-dioxane	SVOCs	U-Total U^{235} / U^{238} and Th Th^{232}	Total and Dissolved Metals	Nitrate / Nitrite	PFAS	Geochemistry Parameters: Total Phosphorous	Ortho-phosphate	Dissolved Organic Carbon	Total and Dissolved Cations (As, Fe, Mn, Ca, Mg, Na, K)	Anions (SO_4^{2-}, F^-, Cl^-)	Alkalinity (Carb/ Bicarb)
		Method 8260	Method 8270D SIM	Method 8270	Method 6020A ICP-MS	Method 6020A ICP-MS	Method 353.2	Method 537 1.1 I.D.	Method 365.1	Method SMP4500P-E	Method 9060	Method 6020A ICP-MS	Method 300	Method 310.1
Hold Times		14 days	7 days	7 days	180 days	180 days	48 hrs	14 days	28 days	48 hours	28 days - F.Filtered	180 days	28 days	14 days-No headspace
Preservative		HCL	ICE	ICE	HNO3	HNO3	ICE	ICE	H2SO4	ICE	H2SO4	HNO3	ICE	ICE
Bottleware		40 ml -G	1 L -G/A	1L -G/A	500 ml -P	500 ml -P	250 ml -P	250ml-P	250 ml-P	250 ml-P	40 ml -G	500 ml -P	250 ml-P	250 ml-P
Bottleware #		3	2	2	1	1	1	2	1	1	3	1	1	1

Notes:
As: arsenic
Ca: cadmium
Fe: iron
H2SO4: sulfuric acid
HCl: hydrochloric acid
HNO3: nitric acid
ICP-MS: inductively coupled plasma mass spectrometry
K: potassium
Mg: magnesium
ml: milliliter
Mn : manganese
MS/MSD: matrix spike/matrix spike duplicate
Na: sodium
PFAS: per- and polyfluoroalkyl substances
SVOC: semivolatile organic compound
Th: thorium
U: uranium
VOC: volatile organic compound

Table 2-2a. Depth to Water and Groundwater Elevation Data - November 2019
Nuclear Metals Superfund Site, Concord, Massachusetts

Location Name	Measuring Point Elevation (ft NGVD)	11/10/2019		Well Type
		Depth to Water (ft)	Groundwater Elevation (ft NGVD)	
GZW-10-1	186.30	56.04	130.26	OB
GZW-10-2	186.30	57.12	129.18	BRS
GZW-11-2	195.45	66.89	128.56	BRS
GZW-5	196.02	49.76	146.26	OB
GZW-7-1	195.62	59.72	135.9	OB
GZW-7S	193.67	58.15	135.52	OB
GZW-8-1	127.57	7.45	120.12	OB
GZW-8-2	127.10	14.33	112.77	BRS
GZW-9-1	183.07	41.25	141.82	OB
GZW-9-2	183.15	41.34	141.81	OB
HA-10A	180.94	37.23	143.71	OB
HA-11	158.43	12.85	145.58	OB
HB-07	178.50	40.53	137.97	OB
HB-10	180.37	37.56	142.81	OB
HB-10S	179.81	36.9	142.91	OB
HB-11	175.01	34.86	140.15	OB
HB-12	182.85	46.51	136.34	OB
HBPZ-2R	176.05	39.7	136.35	OB
ML-1-1	175.49	45.24	130.25	Till
ML-1-2	175.35	45.07	130.28	Till
ML-1-3	175.40	51.73	123.67	BRS
ML-3-1	146.77	15.95	130.82	OB
ML-3-3	148.80	20.08	128.72	BRS
MW-1	155.60	26.75	128.85	OB
MW-2	149.02	17.15	131.87	OB
MW-8A	191.72	57.98	133.74	OB
MW-BM03	191.06	57.54	133.52	BRM
MW-BM15	135.60	6.01	129.59	BRM
MW-BS01	194.03	64.54	129.49	BRS
MW-BS02	191.74	58.92	132.82	BRS
MW-BS03	190.14	57.72	132.42	BRS
MW-BS04	178.07	44.88	133.19	BRS
MW-BS10	194.00	52.61	141.39	BRS
MW-BS12	184.33	39.21	145.12	BRS
MW-BS13	181.52	50.45	131.07	BRS
MW-BS14	193.84	64.56	129.28	BRS
MW-BS15	135.29	8.86	126.43	BRS
MW-BS17	189.30	56.75	132.55	BRS
MW-BS21	188.11	41.51	146.6	BRS

Table 2-2a. Depth to Water and Groundwater Elevation Data - November 2019
Nuclear Metals Superfund Site, Concord, Massachusetts

Location Name	Measuring Point Elevation (ft NGVD)	11/10/2019		Well Type
		Depth to Water (ft)	Groundwater Elevation (ft NGVD)	
MW-BS22	174.59	33.12	141.47	BRS
MW-BS25	152.95	23.87	129.08	BRS
MW-BS26	131.87	5.34	126.53	BRS
MW-BS28	197.35	69.14	128.21	BRS
MW-BS31	139.37	12.79	126.58	BRS
MW-BS32	131.36	6.11	125.25	BRS
MW-BS34	133.60	8.21	125.39	BRS
MW-BS35	138.80	10.92	127.88	BRS
MW-BS36	134.76	9.49	125.27	BRS
MW-BS37	140.69	16.63	124.06	BRS
MW-BS38	136.39	10.93	125.46	BRS
MW-BS39	136.52	11.18	125.34	BRS
MW-BS40	138.76	14.16	124.6	BRS
MW-BS46	140.13	15.81	124.32	BRS
MW-S01	193.37	64.23	129.14	OB
MW-S02	191.40	59.27	132.13	OB
MW-S03	191.20	42.5	148.7	OB
MW-S04	177.34	25.96	151.38	OB
MW-S06	177.92	46.66	131.26	OB
MW-S07	190.33	57.21	133.12	OB
MW-S08	181.11	30.75	150.36	OB
MW-S09	191.08	44.76	146.32	OB
MW-S11	190.54	36.12	154.42	OB
MW-S12	184.43	40.13	144.3	OB
MW-S14	194.90	65.19	129.71	OB
MW-S15	134.17	7.42	126.75	OB
MW-S16	187.40	57.66	129.74	OB
MW-S17	188.17	56.12	132.05	OB
MW-S18	158.23	8.76	149.47	OB
MW-S19	187.50	42.07	145.43	OB
MW-S20	156.59	10.95	145.64	OB
MW-S21	187.56	42.29	145.27	OB
MW-S22	175.62	39.36	136.26	OB
MW-S23	183.73	32.69	151.04	OB
MW-S24	185.53	49.86	135.67	OB
MW-S26	130.65	4.89	125.76	OB
MW-S27	186.14	53.83	132.31	OB
MW-S28	196.94	67.16	129.78	OB
MW-S29	194.74	65.54	129.2	OB

Table 2-2a. Depth to Water and Groundwater Elevation Data - November 2019
Nuclear Metals Superfund Site, Concord, Massachusetts

Location Name	Measuring Point Elevation (ft NGVD)	11/10/2019		Well Type
		Depth to Water (ft)	Groundwater Elevation (ft NGVD)	
MW-S30	187.23	55.06	132.17	OB
MW-S32	131.23	6.17	125.06	OB
MW-S35	138.95	13.43	125.52	OB
MW-S36	135.09	9.89	125.2	OB
MW-S37	140.96	16.81	124.15	OB
MW-S38	136.56	12.01	124.55	OB
MW-S39	136.79	12.47	124.32	OB
MW-S40	138.71	13.56	125.15	OB
MW-SD01	193.54	64.56	128.98	OB
MW-SD02	190.73	58.25	132.48	OB
MW-SD06	178.23	47.01	131.22	OB
MW-SD10	194.29	54.17	140.12	OB
MW-SD13	180.68	50.41	130.27	OB
MW-SD17	189.28	56.54	132.74	OB
MW-SD26	130.56	5.48	125.08	OB
MW-SD27	185.90	53.9	132	OB
MW-SD29	195.56	67.03	128.53	OB
MW-SD30	187.06	54.98	132.08	OB
MW-SD32	131.37	6.26	125.11	OB
MW-SD34	133.56	8.46	125.1	OB
MW-SD35	138.79	11.39	127.4	OB
MW-SD36	134.78	9.42	125.36	OB
MW-SD37	141.11	17.08	124.03	OB
MW-SD38	135.95	11.24	124.71	OB
MW-SD39	136.77	12.69	124.08	OB
MW-SD40	138.67	15.31	123.36	OB
MW-SD41	136.60	12.12	124.48	OB
MW-SD42A	137.70	13.34	124.36	OB
MW-SD43	137.78	13.24	124.54	OB
MW-SD44	137.01	12.66	124.35	OB
MW-SD45	140.15	15.51	124.64	OB
MW-SD46	140.37	17.07	123.3	OB
MW-SM13	181.10	50.54	130.56	OB
MW-SM46	140.22	16.96	123.26	OB
MW-T10	194.86	55.63	139.23	Till
MW-T24	185.11	49.61	135.5	Till
OW-2	151.90	21.83	130.07	OB
OW-3	147.30	19.12	128.18	OB
P-1	127.80	7.5	120.3	OB

Table 2-2a. Depth to Water and Groundwater Elevation Data - November 2019
Nuclear Metals Superfund Site, Concord, Massachusetts

Location Name	Measuring Point Elevation (ft NGVD)	11/10/2019		Well Type
		Depth to Water (ft)	Groundwater Elevation (ft NGVD)	
P-1A	128.80	7.24	121.56	OB
P-2	129.62	4.22	125.4	OB
P-3	130.34	4.2	126.14	OB
P-4	159.14	29.47	129.67	OB
PT-09	134.60	9.88	124.72	OB
PT-10	135.23	10.13	125.0999	OB
PT-11P	133.30	8.22	125.08	OB
PW-6	182.84	39.42	143.42	OB
PZ-1A	139.08	19.33	119.75	OB
PZ-2A	137.67	13.10	124.57	OB
PZ-RI-S01	155.99	11.75	144.24	OB
PZ-RI-S02	158.24	13.41	144.83	OB
PZ-RI-S05	161.54	26.37	135.17	OB
SW-1	153.00	21.52	131.48	OB
SW-2A	193.26	48.33	144.93	BRD

Notes:
1. The depth to water at MW-S16 was found to be erroneous and adjusted based on a January 23, 2020 measurement and average November to January water level difference in surrounding wells. The adjusted measurement is shown.
2. Well names beginning with LF and PT are part of the W.R. Grace Superfund Site monitoring well network.
3. Groundwater Elevations for locations MW-S40, MS-SD40, and MW-BS40 were estimated by comparing data collected on November 17, 2015, and January 21, 2016.

BRD: deep bedrock
BRM: medium (intermediate) bedrock
BRS: shallow bedrok
ft: feet
NGVD: National Geodetic Vertical Datum of 1929.

Table 2-2b. Field Parameters - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

		Analyte	DO	ORP	pH	Specific Conductance	Temp	Turbidity	Notes
		Unit	mg/L	millivolts	SU	µs/cm	°C	NTU	
Sample Location	**Sample Date**	**Formation**							
ASSABET_MIX	11/18/2019		5.65	157.8	5.64	576.12	10.22	2.11	
ASSABET-1A	11/18/2019		2.79	169.8	5.86	671.15	11.49	1.1	
ASSABET-2A	11/18/2019		5.93	179.8	6.2	519.61	11.29	129.32	
GZW-7-2	11/18/2019	Bedrock	0.98	33.2	8.13	1198	9	15.4	Barcad well
GZW-8-2	11/19/2019	Bedrock	0.45	13	6.66	384.9	10.4	--	Barcad well
ML-1-3	11/15/2019	Bedrock	0.83	-130.1	6.62	277.6	9	21.5	Barcad well
ML-3-3	11/18/2019	Bedrock	2.97	19.8	6.75	288.4	9.5	9.15	Barcad well
GZW-10-2	11/15/2019	Bedrock	1.5	86.5	7.86	725	9.2	5.53	see Stabilization Note
GZW-11-2	11/14/2019	Bedrock	3.39	96.6	7.67	187	5.2	2.66	see Stabilization Note
MW-BM03	11/15/2019	Bedrock	0.1	-109.3	7.41	594.94	12.08	10.66	see Stabilization Note
MW-BM15	11/19/2019	Bedrock	0.58	35.8	7.22	705.09	9.16	3.06	
MW-BS02	11/12/2019	Bedrock	0.16	-317.3	8.04	521.11	11.19	4.72	
MW-BS03	11/15/2019	Bedrock	0.08	-64.1	6.84	440.09	11.14	4.94	see Stabilization Note
MW-BS04	11/13/2019	Bedrock	-0.19	-288.1	9.06	133	8.2	16.8	see Stabilization Note
MW-BS10	11/14/2019	Bedrock	1.33	-112.3	7.76	75	4.6	4.68	see Stabilization Note
MW-BS12	11/15/2019	Bedrock	4.33	92.5	10.6	245.7	9.1	4.8	see Stabilization Note
MW-BS13	11/11/2019	Bedrock	0.39	55.8	8.92	633	10.3	18.2	see Stabilization Note
MW-BS14	11/13/2019	Bedrock	0.04	-385.4	10.65	306	7.2	12.22	
MW-BS15	11/18/2019	Bedrock	0.26	64.3	7.48	1536.4	9.16	8.91	see Stabilization Note
MW-BS17	11/11/2019	Bedrock	0.3	47.6	0.86	234.21	10.79	4.73	
MW-BS21	11/15/2019	Bedrock	2.94	36	7.06	535	9	6.39	see Stabilization Note
MW-BS25	11/15/2019	Bedrock	-0.14	-211.6	12.87	2386	10	0.78	see Stabilization Note
MW-BS26	11/18/2019	Bedrock	0.09	-91.9	9.29	800	10.1	4.78	see Stabilization Note
MW-BS28	11/15/2019	Bedrock	0.16	-25.2	6.93	890	8.5	1.86	
MW-BS31	11/15/2019	Bedrock	0.13	-138.4	7.09	563	11.2	0.75	see Stabilization Note
MW-BS32	11/12/2019	Bedrock	0.06	-57.9	6.48	1005	10.6	13	see Stabilization Note
MW-BS35	11/12/2019	Bedrock	0.04	-490	8.26	246.5	10.6	93.8	see Stabilization Note
MW-BS36	11/15/2019	Bedrock	0.67	-154.7	7.52	333.1	11.82	2.39	
MW-BS37	11/15/2019	Bedrock	0.19	-298	8.87	285	13	13.2	
MW-BS38	11/12/2019	Bedrock	0.32	-79.9	7.5	297.7	14.85	5.6	see Stabilization Note
MW-BS39	11/13/2019	Bedrock	0.13	-358.3	10.5	615.04	11.4	18.7	see Stabilization Note
MW-BS40	11/11/2019	Bedrock	0.54	-91.8	7.87	521.99	10.95	7.31	
MW-BS46	11/18/2019	Bedrock	0.21	-209.11	7.6	449.91	10.22	0.81	
SW-2A	11/14/2019	Bedrock	0.15	-158	8.38	128	8.7	2.63	
EW-1	11/18/2019	Overburden	0.14	62	6.28	272.7	12.02	-0.04	
ML-1-2	11/18/2019	Overburden	1.92	95.7	6.59	308.9	9.5	24.7	Barcad well
ML-3-1	11/19/2019	Overburden	5.89	180.5	5.68	103.7	9.9	0.76	
GZW-9-1	11/12/2019	Overburden	9.57	78.7	5.73	390.65	7.9	1.44	
GZW-9-2	11/14/2019	Overburden	0.03	19.7	6.7	175	7.4	295	
HA-09	11/13/2019	Overburden	9.7	169.2	6.85	44	7.4	11.73	
HA-11	11/13/2019	Overburden	0.17	10.7	5.79	82	9.7	7.98	
HB-10	11/13/2019	Overburden	0.23	112.9	5.84	192.2	9.2	3.19	
HB-10S	11/12/2019	Overburden	0.36	16.2	6.13	31330	9.5	11.39	Conductivity recorded vs. SC
HB-11	11/12/2019	Overburden	0.23	141.5	5.82	13605	9.2	2.54	Conductivity recorded vs. SC
HB-12	11/11/2019	Overburden	11.44	239.1	6.54	80	10.42	3.61	Specific conductivity error
HB-620	11/11/2019	Overburden	10.69	212.5	6.28	303.22	4.69	2.21	
HBPZ-2R	11/11/2019	Overburden	9.1	220.1	6.08	323.02	10.3	4.21	
ML-1-1	11/13/2019	Overburden	7.52	245.1	5.98	228.02	4.94	0.49	
GZW-7S	11/13/2019	Overburden	8.29	64	5.97	367.69	7.74	0.59	
GZW-8-1	11/11/2019	Overburden	7.02	192.5	5.9	391.36	12.13	1.74	
GZW-7-1	11/14/2019	Overburden	10.01	203.9	6.16	307.5	7.1	0.21	
MW-1	11/14/2019	Overburden	8.97	35.6	6.08	575.17	9.87	3.43	
MW-2	11/11/2019	Overburden	4.41	209.6	5.81	155.25	10.22	2.21	
MW-8A	11/13/2019	Overburden	9.64	122.8	6.22	342.41	9.41	4.71	
MW-S01	11/15/2019	Overburden	8.1	193.5	6.26	354.92	9.86	1.66	
MW-S02	11/14/2019	Overburden	8.03	195.5	5.95	248.78	11.48	461	
MW-S03	11/12/2019	Overburden	2.52	253.9	5.89	251	10.6	3.47	
MW-S04	11/13/2019	Overburden	8.68	270.6	5.64	54	7.8	1.05	
MW-S06	11/14/2019	Overburden	7.78	208.1	5.79	208	9.5	2.94	
MW-S07	11/11/2019	Overburden	5.81	208.2	5.76	216	10.5	7.49	
MW-S08	11/13/2019	Overburden	7.25	297.9	5.94	118	11.6	14.8	see Stabilization Note
MW-S09	11/12/2019	Overburden	7.82	357.9	5.84	257	11.4	8.73	
MW-S11	11/13/2019	Overburden	11.87	117	5.74	45.92	8.11	0.32	see Stabilization Note
MW-S12	11/14/2019	Overburden	10.65	161.8	5.67	78.4	8.9	1.93	
MW-S14	11/12/2019	Overburden	8.8	152.5	6.15	350	9.8	5.76	
MW-S15	11/15/2019	Overburden	0.19	233.4	5.24	2474	11.4	1.35	
MW-S16	11/12/2019	Overburden	9.6	65.73	6.17	350.16	9.78	6.65	
MW-S17	11/12/2019	Overburden	4.97	155.9	5.96	287.49	10.15	1.63	
MW-S18	11/11/2019	Overburden	0.06	9.5	5.74	144	12.4	0.68	
MW-S19	11/11/2019	Overburden	11.51	122.2	6.09	39	9.1	2.94	
MW-S20	11/12/2019	Overburden	0.16	-83.7	6.54	27.283	9.3	12.2	Conductivity recorded vs. SC
MW-S21	11/14/2019	Overburden	11.73	179.8	6.52	48.8	9	0.93	
MW-S23	11/13/2019	Overburden	8.7	264.6	6.16	190	10.2	-31	see Stabilization Note
MW-S24	11/13/2019	Overburden	8.95	183.4	6.21	426.18	9.65	9.61	
MW-S26	11/15/2019	Overburden	5.86	182.9	5.29	1120	11.3	19.8	
MW-S27	11/13/2019	Overburden	7.62	197.9	6.66	153	9.7	2.53	
MW-S29	11/13/2019	Overburden	9.87	193.5	6.05	91	8.4	4.43	
MW-S30	11/15/2019	Overburden	8.82	147	6.03	327.8	11.1	1.26	
MW-S32	11/13/2019	Overburden	6.87	166.8	6.63	233.4	9.7	12.9	
MW-S35	11/12/2019	Overburden	8.76	202.1	5.88	1466	11.3	1.08	
MW-S36	11/11/2019	Overburden	0.05	76.2	6.23	1429.7	11.49	2.34	

Table 2-2b. Field Parameters - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

		Analyte	DO	ORP	pH	Specific Conductance	Temp	Turbidity	Notes
		Unit	mg/L	millivolts	SU	µs/cm	°C	NTU	
Sample Location	**Sample Date**	**Formation**							
MW-S37	11/13/2019	Overburden	3.94	3.2	7.41	263.29	3.26	--	see Stabilization Note
MW-S38	11/13/2019	Overburden	0.06	198.7	6.21	340.74	13.65	2.22	
MW-S39	11/14/2019	Overburden	0.69	171.7	6	636.15	11.41	4.39	
MW-S40	11/14/2019	Overburden	0.22	27.1	6.43	365.67	10.77	6.49	
MW-SD01	11/14/2019	Overburden	9.02	241.9	5.83	235.49	8.33	3.2	
MW-SD02	11/12/2019	Overburden	9.57	129.7	6.22	445.61	9.1	44.6	
MW-SD06	11/14/2019	Overburden	1.33	106.4	7.12	301	9.7	3.74	
MW-SD10	11/12/2019	Overburden	8.52	284.8	6.57	107	5.8	11.76	
MW-SD13	11/12/2019	Overburden	7.89	131.7	6.12	198	10	7.15	
MW-SD17	11/12/2019	Overburden	4.95	163	6.24	348.18	9.78	2.76	
MW-SD26	11/18/2019	Overburden	7.05	123.9	6.2	468.4	10.4	1.47	
MW-SD27	11/12/2019	Overburden	9.09	182.8	6.22	463.88	9.59	1.11	
MW-SD29	11/14/2019	Overburden	9.4	149.6	5.83	294	8.3	9.1	Conductivity recorded vs. SC
MW-SD30	11/12/2019	Overburden	7.7	160	6.01	59864	10.1	1.39	Conductivity recorded vs. SC
MW-SD32	11/15/2019	Overburden	5.96	147.8	6.34	180.8	10.9	31.1	
MW-SD34	11/14/2019	Overburden	0.24	-36.1	6.8	674.11	10.34	6.11	
MW-SD35	11/13/2019	Overburden	0.29	-61.1	6.41	445.3	10.9	16.1	
MW-SD36	11/18/2019	Overburden	0.321	-128.1	7.8	666.82	9.2	4.81	
MW-SD37	11/18/2019	Overburden	0.33	47.6	6.34	311.51	11.03	2.43	
MW-SD38	11/15/2019	Overburden	0.23	0	6.52	275.84	13.34	2.05	
MW-SD39	11/15/2019	Overburden	0.32	148	5.8	804	11.1	3.44	
MW-SD40	11/14/2019	Overburden	0.1	27.8	7.09	427.42	11.06	1.1	
MW-SD41	11/15/2019	Overburden	0.28	27.2	6.78	286.7	11.7	0.47	
MW-SD42A	11/15/2019	Overburden	0	20.8	6.45	293.92	12.77	12.5	
MW-SD43	11/15/2019	Overburden	0.27	98.9	6.48	475.58	11.91	12.9	
MW-SD44	11/15/2019	Overburden	0.35	-59.5	6.53	323.61	11.43	58.7	
MW-SD45	11/14/2019	Overburden	0.15	141.3	6.44	209	11	2.7	
MW-SD46	11/18/2019	Overburden	0.3	-139.1	7.78	455.49	10.34	1.581	
MW-SM13	11/11/2019	Overburden	0.62	103.9	6.22	207	10.6	11.1	
MW-SM46	11/15/2019	Overburden	0.26	-29.3	6.57	338.85	11.77	4.55	
MW-T10	11/14/2019	Overburden	3.93	1166.6	6.4	54	--	6.93	see Stabilization Note
MW-T24	11/13/2019	Overburden	0.35	55.2	7.18	1830.5	9.01	56.1	
OW-2	11/11/2019	Overburden	920	154.5	5.45	629.45	10.9	0.34	
OW-3	11/13/2019	Overburden	7.79	51.2	6.09	687.1	9.53	1.09	
P-1	11/18/2019	Overburden	5.78	100.6	6.37	435	10.1	1.68	
P-1A	11/15/2019	Overburden	5.09	92.9	6.45	317.35	11.11	0.9	
P-2	11/15/2019	Overburden	7.61	165.2	6.12	393.2	11.3	1.48	
P-3	11/15/2019	Overburden	6.54	162.2	6.26	367.4	10.4	1.67	
P-4	11/13/2019	Overburden	9.12	220.1	6.12	499.88	6.76	1.61	
PT-09	11/18/2019	Overburden	0.64	30.2	6.51	241.82	10.99	1.39	
PT-11P	11/13/2019	Overburden	5.94	187.6	6.15	675	10.9	0.09	
PW-6	11/13/2019	Overburden	5.23	36.2	6.15	354.3	8.9	9.91	
SW-1	11/14/2019	Overburden	6.05	197.3	5.97	340.22	7.13	69.5	

Notes:
°C: degrees Celsius
DO: dissolved oxygen
mg/L: milligrams per liter
µs/cm: microsiemens per centimeter
NTU: nephelometric Turbidity Unit
ORP: oxidation-reduction potential
SU: standard unit
Temp: temperature
Stabilization Note: Parameters may not depict stabilization due to low yield (high drawdown) during purging

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	ASSABET-1A		ASSABET-1A (dup)		ASSABET-1A		ASSABET-1A (dup)		ASSABET-2A		ASSABET-2A		GZW-10-2		GZW-10-2	
			Sample Date	11/18/2019		11/18/2019		11/18/2019		11/18/2019		11/18/2019		11/18/2019		11/15/2019		11/15/2019	
			Fraction	D		D		T		T		D		T		D		T	
			Formation													Bedrock		Bedrock	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	**26.9**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	**2.49**	J	**3.01**	
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	**2.53**	J	**2.91**	J
Barium	7440-39-3	2000	ug/l	**59.2**		**57.3**		**59.4**		**58.1**		**44.2**		**43.2**		**11.1**		**15.6**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**36800**		**35900**		**37300**		**36100**		**29000**		**27800**		**102000**		**106000**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	**3.34**	J	**6.85**	J
Cobalt	7440-48-4	6.0	ug/l	**2.08**		**2.01**		**2.03**		**1.97**		**3.94**		**3.79**		**0.526**	J	**2.28**	
Copper	7440-50-8	1300	ug/l	**19.1**		**18.6**		**19**		**19.4**		**1320**	J	**660**	J	**0.684**	J	**1.07**	J
Iron	7439-89-6	14000	ug/l	**325**		**304**		**372**		**328**		**249**		**434**		< 33.0	U	**61**	J
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	**3.66**		**7.46**		< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**8660**		**8340**		**8680**		**8450**		**7690**		**7330**		**36300**		**37100**	
Manganese	7439-96-5	300	ug/l	**689**		**655**		**686**		**670**		**101**		**98.5**		**282**		**643**	
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	**6.71**		**7**	
Nickel	7440-02-0		ug/l	**11.4**		**11.2**		**11.6**		**11.2**		**3.59**		**3.35**		**3.27**		**5.53**	
Potassium	7440-09-7		ug/l	**5120**		**4910**		**5120**		**5030**		**5190**		**5070**		**6110**		**6200**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**83200**		**80400**		**83400**		**82100**		**68100**		**64600**		**36200**	J	**36800**	J
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	**0.492**		**0.511**	
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	< 0.067	U	< 0.067	U	< 0.067	U	< 0.067	U	< 0.067	U	**67.7**		**70.6**	
Sum U-235/U-238		30	ug/l													**68.2**		**71.1**	
U-235/U-238 Ratio			ug/l													0.73%		0.72%	
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	**13.5**	J	**12.7**	J	**14.6**	J	**14.8**	J	**42**	J	**20.5**	J	**37.2**		**62.2**	

de maximis, inc.
ddms

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	GZW-11-2		GZW-11-2		GZW-7-2		GZW-7-2		GZW-8-2		GZW-8-2		ML-1-3		ML-1-3	
			Sample Date	11/14/2019		11/14/2019		11/18/2019		11/18/2019		11/19/2019		11/19/2019		11/15/2019		11/15/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	**30**	J	**275**		**1160**		**2070**		**1910**		**2520**		**3110**	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	**7.12**		**7.55**		**4.02**	J	**5.84**		**4.33**	J	**4.47**	J	**6.27**		**6.37**	
Barium	7440-39-3	2000	ug/l	**11.5**		**12.6**		**58.2**		**77.2**		**50.9**		**49.2**		**16.2**		**19.5**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	**0.287**	J	**0.229**	J	**0.246**	J	**0.335**	J
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**23500**		**23300**		**92700**		**92400**		**25900**		**24700**		**37000**		**36900**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	**4.63**	J	< 3.00	U	**3.33**	J	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	**0.728**	J	**2.27**		**3.06**		**3.07**		**0.37**	J	**0.516**	J
Copper	7440-50-8	1300	ug/l	**2.78**	NJ	< 0.300	UJ	**3.89**		**15.4**		**10.1**		**10.5**		**3.13**		**7.5**	
Iron	7439-89-6	14000	ug/l	**38.7**	J	**120**		**682**		**3430**		**3650**		**4440**		**1600**		**2330**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	**1.45**	J	**7.74**		**4.01**		**3.58**		**4.94**		**6.56**	
Magnesium	7439-95-4		ug/l	**9990**		**10100**		**22200**		**23600**		**10800**		**10700**		**7520**		**7680**	
Manganese	7439-96-5	300	ug/l	**57.6**		**81.4**		**402**		**552**		**686**		**922**		**108**		**125**	
Molybdenum	7439-98-7	100	ug/l	**10**		**10**		**44.1**	J	**34.2**	J	< 1.12	U	< 1.34	U	**4.22**		**4.32**	
Nickel	7440-02-0		ug/l	< 0.600	U	< 0.600	U	**1.83**	J	**4.96**		**5.36**		**3.87**		**2.16**		**2.95**	
Potassium	7440-09-7		ug/l	**3330**		**3350**		**6530**		**7030**		**6700**	J	**5990**	J	**4900**		**4870**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**13200**		**13100**		**105000**		**106000**		**44600**	J	**39900**	J	**8130**	J	**8060**	J
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	**0.831**	J	< 2.00	U	< 2.00	U	**4.15**		**5.3**	
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	**0.314**		**0.334**		**0.0171**	J	< 0.010	U	**0.0747**		**0.0766**	
Uranium-238	7440-61-2	30	ug/l	**0.71**		**0.759**		**44.2**		**46.9**		**2.03**		**0.704**		**10.3**		**9.59**	
Sum U-235/U-238		30	ug/l	**0.71**		**0.759**		**44.5**		**47.2**		**2.05**		**0.704**		**10.4**		**9.67**	
U-235/U-238 Ratio			ug/l					0.71%		0.71%		0.84%				0.73%		0.80%	
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	**9.03**	J	**5.96**	J	**6.24**	J	**5.09**	J	**6.02**	J
Zinc	7440-66-6		ug/l	**3.41**	J	**3.85**	J	**4.97**	J	**23**		**85.4**		**127**		< 20.0	U	< 20.0	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	ML-3-3		ML-3-3		MW-BM03		MW-BM03		MW-BM15		MW-BM15		MW-BS01		MW-BS01	
			Sample Date	11/19/2019		11/19/2019		11/15/2019		11/15/2019		11/19/2019		11/19/2019		11/12/2019		11/12/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**2790**	J	**758**	J	< 19.3	U	**71.4**		< 19.3	U	**34**	J	**218**	J	**144**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	**6.13**		**6.28**		< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	**13**		**21.2**		**583**		**608**		**3.44**	J	**3.5**	J	< 9.59	U	**9.39**	
Barium	7440-39-3	2000	ug/l	**27.6**	J	**22.9**	J	**112**		**118**		**73.4**		**75.1**		**22.8**		**21.4**	
Beryllium	7440-41-7		ug/l	**0.286**	J	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**12400**		**14800**		**77000**		**84300**		**42900**		**42900**		**33300**	J	**29900**	J
Chromium	7440-47-3	100	ug/l	**5.56**	J	< 3.00	U	< 3.00	U	**11.4**		< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	**2.75**		**2.86**		**3.26**		**4.03**		< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	**1.2**	J	**4.02**		**0.616**	J	**4.92**		< 0.300	U	**0.313**	J	**0.362**	J	< 0.300	U
Iron	7439-89-6	14000	ug/l	**1750**	J	**659**	J	**1130**		**1280**		**2010**		**2120**		< 33.0	UJ	< 33.0	UJ
Lead	7439-92-1		ug/l	**4.65**		**1.59**	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**3470**		**3710**		**25200**		**26200**		**17600**		**17600**		**10200**		**9340**	
Manganese	7439-96-5	300	ug/l	**97.9**		**140**		**290**		**298**		**170**		**170**		**42.2**	J	**37.2**	J
Molybdenum	7439-98-7	100	ug/l	**14.9**		**69.9**		**14.1**		**14.3**		< 2.96	U	< 2.93	U	**8.09**		**7.35**	
Nickel	7440-02-0		ug/l	**3.27**		**2.25**		**4.9**		**5.85**		**0.991**	J	**1.26**	J	< 0.600	U	< 0.600	U
Potassium	7440-09-7		ug/l	**4950**	J	**3560**	J	**8520**		**8570**		**5150**		**5170**		**6490**		**6220**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**68100**		**150000**		**47600**		**49600**		**26600**		**26600**		**24600**		**24500**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	**5.38**	NJ	< 0.700	UJ	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	**0.0555**	J	**0.207**		**0.315**		**0.33**		< 0.010	U	< 0.010	U	**0.0419**	J	**0.0396**	J
Uranium-238	7440-61-2	30	ug/l	**7.69**		**28.1**		**43.2**		**45**		< 0.067	U	< 0.067	U	**5.68**		**5.45**	
Sum U-235/U-238		30	ug/l	**7.75**		**28.3**		**43.5**		**45.3**						**5.72**		**5.49**	
U-235/U-238 Ratio			ug/l	**0.72%**		**0.74%**		**0.73%**		**0.73%**						**0.74%**		**0.73%**	
Vanadium	7440-62-2		ug/l	**7.38**	J	**3.48**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 20.0	U	< 3.30	U
Zinc	7440-66-6		ug/l	**63.1**	J	**26.2**	J	< 3.30	U	**3.74**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-BS02		MW-BS02		MW-BS03		MW-BS03		MW-BS04		MW-BS04		MW-BS10		MW-BS10	
			Sample Date	11/12/2019		11/12/2019		11/15/2019		11/15/2019		11/13/2019		11/13/2019		11/14/2019		11/14/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**40.3**	J	**82.8**		< 19.3	U	**240**		< 19.3	U	**32.2**	J	< 19.3	U	**70.7**	
Antimony	7440-36-0		ug/l	**3.91**		**3.76**		**1.07**	J	**1.26**	J	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	**27**		**26.3**		**89.3**		**89.2**		**3.24**	J	**5.04**		**2.99**	J	**3.16**	J
Barium	7440-39-3	2000	ug/l	**8.7**		**9.21**		**61.8**		**65**		**12.2**		**13.3**		**5.83**		**6.83**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**22400**		**21400**		**54300**		**54300**		**15400**		**16000**		**15800**		**15700**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	**6.72**		**7.18**		< 0.300	U	**0.607**	J	< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	**0.634**	J	**2.44**		< 0.300	U	**2.36**		**0.712**	J	**2.1**		**0.331**	J	< 2.00	U
Iron	7439-89-6	14000	ug/l	**105**		**290**		**2610**		**3290**		**986**		**14600**		**102**		**239**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	**1.83**	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**11100**	J	**9950**	J	**19800**		**20500**		**5460**		**5710**		**5920**		**5950**	
Manganese	7439-96-5	300	ug/l	**122**		**120**		**978**		**992**		**275**		**497**		**328**		**344**	
Molybdenum	7439-98-7	100	ug/l	**3.26**		**5.58**		**3.08**	J	**2.7**	J	**3.99**		**4.55**		**19.1**		**18.8**	
Nickel	7440-02-0		ug/l	**10.5**		**11**		**12.4**		**13.1**		< 0.600	U	**7.56**		< 0.600	U	< 0.600	U
Potassium	7440-09-7		ug/l	**11700**	J	**10200**	J	**5750**		**6000**		**2110**		**2140**		**2500**		**2520**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	**0.52**	J	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**43800**		**41600**		**34400**		**34200**		**9180**		**9330**		**13300**		**13400**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	**0.154**		**0.187**		**0.493**		**0.502**		< 0.010	U	< 0.010	U	**0.224**		**0.226**	
Uranium-238	7440-61-2	30	ug/l	**21.3**		**25.8**		**66.1**		**69.1**		< 0.067	U	**0.215**		**30.6**		**31.3**	
Sum U-235/U-238		30	ug/l	**21.5**		**26.0**		**66.6**		**69.6**				**0.215**		**30.8**		**31.5**	
U-235/U-238 Ratio			ug/l	0.72%		0.72%		0.75%		0.73%						0.73%		0.72%	
Vanadium	7440-62-2		ug/l	< 20.0	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	**9.57**	J	**13.7**	J	< 3.30	U	**5.58**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-BS12		MW-BS12		MW-BS13		MW-BS13		MW-BS14		MW-BS14		MW-BS15		MW-BS15	
			Sample Date	11/15/2019		11/15/2019		11/13/2019		11/13/2019		11/13/2019		11/13/2019		11/18/2019		11/18/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**1980**		**2240**		**109**		**536**		**33.6**	J	**22.1**	J	< 19.3	U	**22**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	**4.33**		**1.3**	J	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	**49.6**		**54**		< 2.00	U	**2.48**	J	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**32**		**37**		**37.2**		**54.7**		**48.5**		**45.6**		**23.8**		**25.8**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**27900**		**29900**		**76500**		**91700**		**8320**		**9230**		**106000**		**119000**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	**5.38**	J	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	**0.582**	J	**0.626**	J	**10.7**		**17.4**	
Copper	7440-50-8	1300	ug/l	**1.06**	J	**1.67**	J	**0.909**	J	**2.27**		**0.503**	J	< 2.00	U	**1.1**	J	**1.72**	J
Iron	7439-89-6	14000	ug/l	< 33.0	U	**92.4**	J	**150**		**611**		< 33.0	U	< 33.0	U	**124**		**211**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	**0.807**	J	**3.69**		< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**64.3**		**73.3**		**23400**		**24500**		**3070**		**2940**		**34000**		**36400**	
Manganese	7439-96-5	300	ug/l	< 1.00	U	**6.34**		**83**		**112**		**6.29**		**10.5**		**533**		**735**	
Molybdenum	7439-98-7	100	ug/l	**9.16**		**9.69**		**2.75**		**2.84**		**17.1**		**16.2**		**5.71**		**5.75**	
Nickel	7440-02-0		ug/l	**0.839**	J	**1.07**	J	**1.78**	J	**3.55**		**2.75**		**2.68**		**5.39**		**6.74**	
Potassium	7440-09-7		ug/l	**5570**		**6000**		**28400**		**27900**		**45700**		**41900**		**14700**		**15500**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**17400**		**18700**		**47500**		**49000**		**45900**		**46300**		**81300**		**91200**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	**0.0452**	J	**0.0466**	J	**0.423**		**0.485**		< 0.010	U	< 0.010	U	**0.0391**	J	**0.0419**	J
Uranium-238	7440-61-2	30	ug/l	**6.28**		**6.38**		**56.6**		**64.8**		**0.102**	J	< 0.200	U	**5.36**		**5.84**	
Sum U-235/U-238		30	ug/l	**6.33**		**6.43**		**57.0**		**65.3**		**0.102**				**5.40**		**5.88**	
U-235/U-238 Ratio			ug/l	0.72%		0.73%		0.75%		0.75%						0.73%		0.72%	
Vanadium	7440-62-2		ug/l	**32.1**		**34.6**		< 3.30	U	**3.66**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	**9.36**	J	**16.9**	J	**64.9**		< 3.30	U	< 3.30	U	**6.49**	J	**9.24**	J

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-BS17		MW-BS17		MW-BS21		MW-BS21		MW-BS22		MW-BS22		MW-BS25		MW-BS25 (dup)	
			Sample Date	11/11/2019		11/11/2019		11/15/2019		11/15/2019		11/13/2019		11/13/2019		11/15/2019		11/15/2019	
			Fraction	D		T		D		T		D		T		D		D	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**46.1**	J	**94.5**		< 19.3	U	**710**		**22.1**	J	**29.2**	J	**839**		**893**	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	**3.03**	J	**3.9**	J	**2.77**	J	**2.87**	J	**3.28**	J	**2.98**	J	**2.43**	J	**2.59**	J
Barium	7440-39-3	2000	ug/l	**22.6**		**23.4**		**49**		**53**		**24.5**		**23.7**		**542**	J	**525**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**24500**		**23200**		**44300**		**45200**		**50500**		**49800**		**289000**		**280000**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**0.856**	J	**0.895**	J	< 0.300	U	**0.363**	J	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	**0.398**	J	**0.406**	J	**0.447**	J	< 2.00	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Iron	7439-89-6	14000	ug/l	**258**		**355**		**72.1**	J	**729**		**69.5**	J	**48.4**	J	**54.9**	J	**59.6**	J
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	**0.922**	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**6850**		**6250**		**11900**		**12200**		**9960**		**9340**		**237**		**287**	
Manganese	7439-96-5	300	ug/l	**613**		**579**		**145**		**159**		< 1.00	U	**1.11**	J	< 1.00	U	< 1.00	U
Molybdenum	7439-98-7	100	ug/l	**1.14**		**1.17**		**3.11**		**3.13**		**0.541**	J	< 1.00	U	**3.32**		**3.28**	
Nickel	7440-02-0		ug/l	< 2.00	U	**0.777**	J	< 0.600	U	**0.937**	J	< 0.600	U	< 0.600	U	**1.34**	J	**1.28**	J
Potassium	7440-09-7		ug/l	**3570**		**3430**		**4120**		**4090**		**3390**		**3250**		**11500**		**11700**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**10800**		**11000**		**19400**		**19000**		**8070**		**7610**		**27500**		**27200**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	**0.01**	J	< 0.010	U	**0.0498**	J	**0.0523**	J	**0.0947**		**0.0878**		< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**1.41**	J	**1.25**	J	**7.05**		**7.42**		**12.9**		**12.1**		**0.324**		**0.333**	
Sum U-235/U-238		30	ug/l	**1.42**		**1.25**		**7.10**		**7.47**		**13.0**		**12.2**		**0.324**		**0.333**	
U-235/U-238 Ratio			ug/l	0.71%				0.71%		0.70%		0.73%		0.73%					
Vanadium	7440-62-2		ug/l	< 20.0	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	**5.49**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-BS25		MW-BS25 (dup)		MW-BS26		MW-BS26		MW-BS28		MW-BS28		MW-BS31		MW-BS31	
			Sample Date	11/15/2019		11/15/2019		11/19/2019		11/19/2019		11/15/2019		11/15/2019		11/15/2019		11/15/2019	
			Fraction	T		T		D		T		D		T		D		T	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	966		1010		22.7	J	126		< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	2.43	J	2.63	J	2.51	J	2.8	J	2.3	J	2.26	J	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	472	J	504		170		181		21.7		22.1		37.8		36.7	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	266000		272000		62100		67700		128000		132000		46800		47000	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	1.16		1.14		< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	< 2.00	U	< 2.00	U	0.347	J	1.01	J	0.788	J	< 0.300	U	0.446	J	< 0.300	U
Iron	7439-89-6	14000	ug/l	78.6	J	83.7	J	315		683		247		258		5920		5690	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	818		783		17200		18200		36800		37000		20900		20800	
Manganese	7439-96-5	300	ug/l	7.62		6.67		254		282		901		900		1210		1270	
Molybdenum	7439-98-7	100	ug/l	3.33		3.39		< 1.6	U	< 1.68	U	2.83		2.7		0.285	J	0.3	J
Nickel	7440-02-0		ug/l	1.28	J	1.52	J	0.944	J	1.32	J	3.97		3.94		< 0.600	U	< 0.600	U
Potassium	7440-09-7		ug/l	10800		11400		7130		7260		12000		12000		11600		11600	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	25800		26300		29500		30000		44900		45700		19500		19900	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	0.204		0.206		< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	0.727		0.646		< 0.067	U	< 0.067	U	28.2		28.4		< 0.067	U	< 0.067	U
Sum U-235/U-238		30	ug/l	0.727		0.646						28.4		28.6					
U-235/U-238 Ratio			ug/l									0.72%		0.73%					
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	3.94	J	< 3.30	U	< 20.0	U	< 3.30	U	3.87	J	< 3.30	U	< 3.30	U

de maximis, inc.
ddms

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-BS32		MW-BS32		MW-BS34		MW-BS34		MW-BS35		MW-BS35		MW-BS36		MW-BS36	
			Sample Date	11/12/2019		11/12/2019		11/15/2019		11/15/2019		11/12/2019		11/12/2019		11/15/2019		11/15/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**52.7**		**377**		< 19.3	U	**43.3**	J	**288**		**3250**		**34.3**	J	**45.1**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	**6.52**		**4.88**	J	**142**		**139**		< 2.00	U	**2.78**	J	**12.5**		**12.9**	
Barium	7440-39-3	2000	ug/l	**153**		**158**		**39.3**		**40.7**		**27.3**		**40.9**		**56.6**		**52.9**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**108000**		**107000**		**14900**		**15200**		**17100**		**16400**		**22000**		**19900**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	**9.87**	J	**3.33**	J	**3.45**	J
Cobalt	7440-48-4	6.0	ug/l	**1.23**		**1.55**		**1.43**		**1.49**		< 0.300	U	**1.1**		**2.75**		**2.79**	
Copper	7440-50-8	1300	ug/l	**0.313**	J	**1.55**	J	< 0.300	U	< 2.00	U	**0.453**	J	**3.99**		**0.305**	J	< 0.300	U
Iron	7439-89-6	14000	ug/l	**10100**		**11100**		**1340**		**1440**		**604**		**3360**		**6540**	J	**4230**	J
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	**1.05**	J	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**40600**		**38300**		**6450**		**6300**		**5990**		**6050**		**8570**		**7970**	
Manganese	7439-96-5	300	ug/l	**755**		**784**		**551**		**548**		**49.6**		**88**		**225**	J	**167**	J
Molybdenum	7439-98-7	100	ug/l	**0.991**	J	**1.03**		**4.62**		**4.31**		**4.66**		**5.41**		**1.74**		**1.92**	
Nickel	7440-02-0		ug/l	< 2.08	U	**2.94**		< 0.600	U	< 0.600	U	< 0.600	U	**3.1**		**2.12**		**2.18**	
Potassium	7440-09-7		ug/l	**8140**		**7540**		**4150**		**4090**		**4600**		**5220**		**5200**		**6450**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**44200**		**40400**		**17000**		**16700**		**14900**		**14900**		**20800**	J	**21100**	J
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	**0.775**	J	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**0.786**		**0.794**		**0.103**	J	**0.153**	J	< 0.0670	U	**0.191**	J	< 0.200	U	< 0.314	U
Sum U-235/U-238		30	ug/l	**0.786**		**0.794**		**0.103**		**0.153**				**0.191**					
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 20.0	U	**8.69**	J	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	**4.56**	J	< 3.30	U	< 3.30	U	< 3.30	U	**11**	J	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-BS37		MW-BS37		MW-BS38		MW-BS38		MW-BS39		MW-BS39		MW-BS40		MW-BS40	
			Sample Date	11/15/2019		11/15/2019		11/12/2019		11/12/2019		11/13/2019		11/13/2019		11/11/2019		11/11/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	Cas No.	Limit	Unit													5			
Aluminum	7429-90-5		ug/l	< 19.3	U	**20.8**	J	**25.3**	J	< 19.3	UJ	**133**		**1520**		**146**		**432**	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 5.00	U	< 5.00	U	< 2.00	U	< 2.00	U	< 2.00	U	**2.05**	J	**2.27**	J	**2.94**	J
Barium	7440-39-3	2000	ug/l	**81.5**		**93.7**		**46.9**		**45.2**		**21.1**		**31.6**		**118**		**118**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**28600**		**35100**		**19600**		**18500**		**11500**		**12600**		**43500**		**41000**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	**7.11**	J	< 3.00	U	< 3.00	U	< 3.00	U	**3.63**	J	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	**2.06**		**2.31**		**2.55**	
Copper	7440-50-8	1300	ug/l	< 0.300	U	< 2.00	U	**0.354**	J	< 0.300	U	**1.2**	J	**11.2**		**2.65**		**5.08**	
Iron	7439-89-6	14000	ug/l	**1690**		**4870**	J	**846**		**871**		**405**		**4040**		**1700**		**1880**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	**1.27**	J	< 0.500	U	**0.671**	J
Magnesium	7439-95-4		ug/l	**12300**		**13900**		**7090**	J	**6370**	J	**5550**		**5770**		**18800**	J	**16300**	J
Manganese	7439-96-5	300	ug/l	**124**		**206**		**83.7**	J	**70.7**	J	**4.39**	J	**33.9**		**129**		**120**	
Molybdenum	7439-98-7	100	ug/l	**0.593**	J	**0.571**	J	**0.327**	J	**0.271**	J	**12.2**		**12.3**		**1.3**		**1.32**	
Nickel	7440-02-0		ug/l	**0.702**	J	**0.944**	J	< 0.600	U	< 0.600	U	**3.13**		**5.87**		< 2.00	U	**1.78**	J
Potassium	7440-09-7		ug/l	**12600**		**12100**		**3640**		**3520**		**34500**		**32300**		**5140**		**5010**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**28200**		**26200**	J	**19300**		**18000**		**48800**		**51200**		**28300**		**27900**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	**0.123**	J	< 0.0670	U	< 0.0670	U	< 0.067	U	< 0.247	U	**0.0722**	J	**0.0772**	J
Sum U-235/U-238		30	ug/l			**0.123**										**0.072**		**0.077**	
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 20.0	U	< 3.30	U	< 3.30	U	**7.96**	J	< 20.0	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**5.56**	J	**3.51**	J	**4.28**	J

de maximis, inc.
ddms

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-BS46		MW-BS46		SW-2A		SW-2A		EW-1		EW-1		GZW-7-1		GZW-7-1	
			Sample Date	11/18/2019		11/18/2019		11/14/2019		11/14/2019		11/18/2019		11/18/2019		11/14/2019		11/14/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	**1.38**	J	**2.09**	J	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	**71**		**72.7**		< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**94**		**94**		**2.84**	J	**3.11**	J	**30.2**		**31**		**4.84**		**4.46**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**27100**		**27500**		**20700**		**20900**		**34500**		**35100**		**17900**		**17500**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	< 0.300	U	**0.454**	J	**3.41**		**3.41**		< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	< 0.300	U	< 0.300	U	**0.774**	J	< 2.00	U	< 0.300	U	**0.324**	J	**18.5**		**18**	
Iron	7439-89-6	14000	ug/l	**788**		**841**		**214**		**642**		**2360**		**2400**		< 33.0	U	< 33.0	U
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	**0.518**	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**9660**		**9840**		**6240**		**6350**		**12700**		**12900**		**4240**		**4240**	
Manganese	7439-96-5	300	ug/l	**93.6**		**95.7**		**129**		**138**		**386**		**388**		< 1.00	U	< 1.00	U
Molybdenum	7439-98-7	100	ug/l	**0.261**	J	**0.294**	J	**9.87**		**9.48**		< 1.00	U	< 1.00	U	< 1.02	U	< 1.00	U
Nickel	7440-02-0		ug/l	< 0.600	U	< 0.600	U	**1.14**	J	**2.4**		**7.13**		**7.16**		**0.712**	J	**0.663**	J
Potassium	7440-09-7		ug/l	**5110**		**5180**		**1810**		**1820**		**6340**		**6470**		**3450**		**3280**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**23400**		**23600**		**14400**		**14500**		**22800**		**23000**		**26200**		**25200**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	**0.014**	J	**0.0153**	J	< 0.010	U	< 0.010	U	**0.147**		**0.141**	
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	< 0.067	U	**1.91**		**2.12**		**0.781**		**0.807**		**71.8**		**69.2**	
Sum U-235/U-238		30	ug/l					**1.92**		**2.14**		**0.781**		**0.807**		**71.9**		**69.3**	
U-235/U-238 Ratio			ug/l					**0.73%**		**0.72%**						**0.20%**		**0.20%**	
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	**14.6**	J	< 3.30	U	< 3.30	U	**3.33**	J	< 3.30	U

de maximis, inc.
ddms

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	GZW-7S		GZW-7S		GZW-8-1		GZW-8-1		GZW-9-1		GZW-9-1		GZW-9-2		GZW-9-2	
			Sample Date	11/13/2019		11/13/2019		11/11/2019		11/11/2019		11/12/2019		11/12/2019		11/14/2019		11/14/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	< 19.3	U	**25.6**	J	**72.1**		< 19.3	UJ	**25.8**	J	< 19.3	U	**27.8**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**4.41**		**4.12**		**17.1**		**16.9**		**20.6**		**21**		**15.6**		**15**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**19300**		**19300**		**30000**		**27700**		**21500**		**21300**		**20300**		**19500**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	< 0.300	U	**0.725**	J	< 0.300	U	< 0.300	U	**4.28**		**4.21**	
Copper	7440-50-8	1300	ug/l	**14.1**		**12.8**		**0.519**	J	**0.698**	J	**0.596**	J	**0.325**	J	**0.384**	J	**0.921**	J
Iron	7439-89-6	14000	ug/l	< 33.0	U	< 33.0	U	**50.4**	J	**150**		< 33.0	UJ	**37**	J	**501**		**656**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**4690**		**4480**		**8090**		**7010**		**5140**		**4680**		**5450**		**5200**	
Manganese	7439-96-5	300	ug/l	**1.13**	J	**1.88**	J	**11.8**		**50.2**		**1.38**	J	**1.7**	J	**1140**		**1120**	
Molybdenum	7439-98-7	100	ug/l	**3.29**		**3.35**		**1.16**		**1.31**		**0.226**	J	< 1.00	U	**0.446**	J	**0.413**	J
Nickel	7440-02-0		ug/l	**0.948**	J	**0.838**	J	< 2.00	U	**2.65**		< 2.00	U	**0.705**	J	**2.92**		**2.77**	
Potassium	7440-09-7		ug/l	**3230**	J	**2820**	J	**3680**		**3400**		**2310**		**2390**		**3090**		**2940**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**23000**		**23900**		**29100**		**30300**		**48300**		**48600**		**11000**	J	**10500**	J
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	**0.14**		**0.144**		< 0.010	U	< 0.010	U	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**67.3**		**67**		< 0.067	U	< 0.067	U	< 0.0670	U	< 0.0670	U	< 0.067	U	**0.0709**	J
Sum U-235/U-238		30	ug/l	**67.4**		**67.1**												**0.071**	
U-235/U-238 Ratio			ug/l	**0.21%**		**0.21%**													
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**4.52**	J

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	HA-09		HA-09		HA-11		HA-11		HB-10		HB-10		HB-10S		HB-10S	
			Sample Date	11/13/2019		11/13/2019		11/13/2019		11/13/2019		11/13/2019		11/13/2019		11/12/2019		11/12/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**86.1**		**486**		**143**		**808**		< 19.3	U	**28.8**	J	**34.4**	J	**125**	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	**2.27**	J	**2.18**	J	**8.57**		**9.76**		< 2.00	U	< 2.00	U	**17.2**		**17.7**	
Barium	7440-39-3	2000	ug/l	**2.77**	J	**5.16**		**12.5**		**14.7**		**27.4**		**27.8**		**30.7**		**32.8**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**4940**		**5070**		**2480**		**2770**		**10600**		**11000**		< 80.0		< 8810	U
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	**0.321**	J	**2.97**		**3.36**		**7.3**		**7.85**		**17.7**		**17.4**	
Copper	7440-50-8	1300	ug/l	**0.437**	J	< 2.00	U	< 0.300	U	< 2.00	U	**1.09**	J	< 2.00	U	**0.523**	J	**1.26**	J
Iron	7439-89-6	14000	ug/l	**106**		**596**		**7790**		**9240**		**229**		**333**		**14200**		**14900**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	**0.591**	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**854**		**1000**		**798**		**1000**		**2630**		**2710**		**2310**		**2210**	
Manganese	7439-96-5	300	ug/l	**1.64**	J	**7.9**		**261**		**295**		**351**		**378**		**832**		**791**	
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 1.00	U	**1.9**		**2**		**4.49**		**4.71**	
Nickel	7440-02-0		ug/l	< 0.600	U	**0.891**	J	**0.702**	J	**1.18**	J	**1.59**	J	**1.63**	J	< 3.25	U	**3.45**	
Potassium	7440-09-7		ug/l	**785**		**946**		**728**		**880**		**3050**		**3110**		**3060**		**3190**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**4990**		**5050**		**4780**		**5110**		**16700**		**16800**		**12500**		**12800**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.0100	U	< 0.0100	U
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	**0.13**	J	**0.0826**	J	**0.184**	J+	< 0.200	U	**0.231**		**0.201**		**0.323**	
Sum U-235/U-238		30	ug/l			**0.13**		**0.0826**		**0.184**				**0.231**		**0.201**		**0.323**	
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	**7.82**	J	**8.48**	J	< 3.30	U	**4.09**	J	**3.33**	J	< 3.30	U	**4.41**	J	**3.79**	J
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**3.57**	J	< 3.30	U	**5.09**	J	**4.69**	J

de maximis, inc.
ddms

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	HB-11		HB-11		HB-12		HB-12		HB-620		HB-620 (dup)		HB-620		HB-620 (dup)	
			Sample Date	11/12/2019		11/12/2019		11/11/2019		11/11/2019		11/11/2019		11/11/2019		11/11/2019		11/11/2019	
			Fraction	D		T		D		T		D		D		T		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**48**	J	**68.8**		< 19.3	U	< 19.3	U	**236**	J	**203**	J	**50.4**	J	**55.1**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**14**		**14.8**		**3.5**	J	**3.38**	J	**15.9**	J	**16.4**	J	**12.8**	J	**13.3**	J
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	< 80.0	NJ	< 80.0	UJ	**17200**		**17800**		**20000**		**21800**	J	**18200**		**17900**	J
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**2.38**		**2.31**		**0.387**	J	**0.383**	J	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	**1.83**	J	**1.79**	J	**5.75**		**6.2**		**1.14**	J	**0.963**	J	**0.346**	J	**0.427**	J
Iron	7439-89-6	14000	ug/l	**73.4**	J	**138**		< 33.0	U	**51.2**	J	**197**	J	**146**	J	**55**	J	**48.9**	J
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**2340**	J	**2030**	J	**7480**		**6810**		**5170**	J	**5260**	J	**4510**	J	**4460**	J
Manganese	7439-96-5	300	ug/l	**374**		**403**		**2.87**	J	**3.26**	J	**4.74**	J	**4.17**	J	**1.28**	J	**1.18**	J
Molybdenum	7439-98-7	100	ug/l	**1.83**		**1.89**		**56**		**56.5**		**3.12**		**2.96**		**3.38**		**3.32**	
Nickel	7440-02-0		ug/l	**5.87**		**5.93**		< 2.00	U	**1.35**	J	< 2.00	U	< 2.00	U	**0.784**	J	**0.73**	J
Potassium	7440-09-7		ug/l	**1760**		**1750**		**2240**		**2190**		**2820**		**2980**	J	**2620**		**2560**	J
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**9790**		**8920**		**18800**		**19100**		**18400**	J	**18700**	J	**15800**	J	**15300**	J
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.0100	U	< 0.0100	U	**0.86**		**0.888**		< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**0.185**	J	**0.217**		**432**		**440**		**0.186**	J	**0.169**	J	**0.0798**	J	**0.0721**	J
Sum U-235/U-238		30	ug/l	**0.185**		**0.217**		**433**		**441**		**0.186**		**0.169**		**0.080**		**0.072**	
U-235/U-238 Ratio			ug/l					**0.20%**		**0.20%**									
Vanadium	7440-62-2		ug/l	**4.23**	J	< 3.30	U	< 20.0	U	< 3.30	U	< 20.0	U	< 20.0	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	HBPZ-2R		HBPZ-2R		ML-1-1		ML-1-1		ML-1-2		ML-1-2		ML-3-1		ML-3-1	
			Sample Date	11/11/2019		11/11/2019		11/13/2019		11/13/2019		11/18/2019		11/18/2019		11/19/2019		11/19/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**28.9**	J	**241**		< 19.3	U	< 19.3	U	**192**		**578**		< 19.3	U	< 19.3	U
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	**1.51**	J	**1.58**	J	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	**2.02**	J	**2.72**	J	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**3.08**	J	**3.77**	J	**11.6**		**12.2**		**17.2**		**19.8**		**4.64**		**4.74**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	**0.445**	J	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**17400**		**18400**		**16500**		**17200**		**30300**		**31500**		**7990**		**7930**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**0.818**	J	**0.796**	J	< 0.300	U	< 0.300	U	**0.616**	J	**1.04**		< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	**13.9**		**16.5**		**0.676**	J	< 2.00	U	**3.08**		**21.1**		**0.681**	J	**0.582**	J
Iron	7439-89-6	14000	ug/l	**37.9**	J	**311**		< 33.0	U	< 33.0	U	**319**		**862**		< 33.0	U	**34.2**	J
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	**0.773**	J	**5.34**		**3.22**		< 0.500	U
Magnesium	7439-95-4		ug/l	**5910**	J	**5110**	J	**4230**		**4330**		**7510**		**7790**		**2120**		**2100**	
Manganese	7439-96-5	300	ug/l	**14**		**15.3**		< 1.00	U	< 1.00	U	**54.6**		**113**		**6.96**		**34.6**	
Molybdenum	7439-98-7	100	ug/l	**275**	J	**211**	J	**0.665**	J	**0.668**	J	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Nickel	7440-02-0		ug/l	< 2.51	U	**2.66**		< 0.600	U	< 0.600	U	**1.57**	J	**2.4**		**0.75**	J	**0.785**	J
Potassium	7440-09-7		ug/l	**2740**		**2670**		**2520**		**2640**		**3560**		**3710**		**2230**		**2200**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**17700**		**17600**		**14400**		**14500**		**24300**		**24600**		**9160**		**9160**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 2.00	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	**1.11**	J	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	**2.15**		**2.28**		< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**1050**		**1130**		< 0.067	U	< 0.067	U	**0.244**		**0.963**		< 0.067	U	< 0.067	U
Sum U-235/U-238		30	ug/l	**1052**		**1132**						**0.244**		**0.963**					
U-235/U-238 Ratio			ug/l	**0.20%**		**0.20%**													
Vanadium	7440-62-2		ug/l	< 20.0	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**8.09**	J	**6.68**	J
Zinc	7440-66-6		ug/l	< 3.30	U	**4.38**	J	< 3.30	U	< 3.30	U	**8.38**	J	**34.9**		< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-1		MW-1 (dup)		MW-1		MW-1 (dup)		MW-2		MW-2		MW-8A		MW-8A	
			Sample Date	11/14/2019		11/14/2019		11/14/2019		11/14/2019		11/11/2019		11/11/2019		11/13/2019		11/13/2019	
			Fraction	D		D		T		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**43.1**	J	< 19.3	U	**46.9**	J	**28.2**	J	**22.4**	J	**58.6**		< 19.3	U	**41.9**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	**3.17**	J	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**14.5**		**13.7**		**14.2**		**14**		**15.2**		**15.3**		**9.24**		**9.54**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**10100**		**10100**		**9740**		**9810**		**11500**		**10700**		**17200**		**17800**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**1.83**		**1.82**		**1.81**		**1.78**		**0.366**	J	**0.322**	J	**0.437**	J	**0.491**	J
Copper	7440-50-8	1300	ug/l	**1.21**	J	**1.08**	J	**0.989**	J	**0.966**	J	**0.913**	J	**0.445**	J	**7.01**		**9.77**	
Iron	7439-89-6	14000	ug/l	**39.1**	J	< 33.0	U	**54.1**	J	**33**	J	**81.3**	J	**283**		< 33.0	U	**60.8**	J
Lead	7439-92-1		ug/l	**0.737**	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	**1.28**	J
Magnesium	7439-95-4		ug/l	**2670**		**2730**		**2600**		**2620**		**3790**		**3470**		**3980**		**4180**	
Manganese	7439-96-5	300	ug/l	**6.13**		**4.28**	J	**11.1**	J	**7.18**	J	**3.05**	J	**3.24**	J	**3.73**	J	**4.94**	J
Molybdenum	7439-98-7	100	ug/l	**9.69**		**12.2**	J	**8.77**		**9.89**	J	**0.603**	J	**0.539**	J	**42.7**		**42.8**	
Nickel	7440-02-0		ug/l	**1.87**	J	**1.94**	J	**1.78**	J	**1.94**	J	< 2.00	U	**1.39**	J	**1.16**	J	**1.44**	J
Potassium	7440-09-7		ug/l	**2100**		**2030**		**2040**		**2020**		**2550**		**2440**		**2620**		**2740**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	**0.374**	J	< 0.300	U
Sodium	7440-23-5		ug/l	**94500**	J	**86400**	J	**94700**	J	**90300**	J	**12600**		**12100**		**20400**		**21300**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 2.00	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	**0.437**		**0.541**	
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	< 0.067	U	< 0.067	U	< 0.067	U	**0.231**		**0.168**	J	**218**		**250**	
Sum U-235/U-238		30	ug/l									**0.231**		**0.168**		**218**		**251**	
U-235/U-238 Ratio			ug/l													0.20%		0.22%	
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 20.0	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**4.56**	J

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S01		MW-S01		MW-S02		MW-S02 (dup)		MW-S02		MW-S02 (dup)		MW-S03		MW-S03	
			Sample Date	11/15/2019		11/15/2019		11/14/2019		11/14/2019		11/14/2019		11/14/2019		11/12/2019		11/12/2019	
			Fraction	D		T		D		D		T		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	**28.8**	J	< 19.3	U	< 19.3	U	**25.9**	J	**23.5**	J	< 19.3	UJ	**20.1**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 5.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**25.5**		**25.3**		**8.89**		**9.05**		**9.39**		**8.94**		**35**		**36.4**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**21200**		**22000**		**11600**		**11700**		**12200**		**12000**		**16200**		**17100**	
Chromium	7440-47-3	100	ug/l	**5.61**	J	**8.58**	J	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**7.92**		**7.97**		**0.443**	J	**0.445**	J	**0.457**	J	**0.46**	J	**24.2**		**23.1**	
Copper	7440-50-8	1300	ug/l	**8.52**		**9.23**		**18**		**19.4**		**22.1**		**20.3**		**1.81**	J	**1.57**	J
Iron	7439-89-6	14000	ug/l	< 33.0	U	**52.1**	J	< 33.0	U	< 33.0	U	< 33.0	U	< 33.0	U	**103**		**193**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**6400**		**6440**		**1460**		**1470**		**1520**		**1470**		**2660**		**2540**	
Manganese	7439-96-5	300	ug/l	**1.02**	J	**1.69**	J	**1.92**	J	**1.93**	J	**2.32**	J	**2.38**	J	**136**		**131**	
Molybdenum	7439-98-7	100	ug/l	**2.36**		**2.49**		**0.263**	J	**0.274**	J	**0.265**	J	**0.258**	J	< 0.200	U	< 0.200	U
Nickel	7440-02-0		ug/l	**5.51**		**5.51**		**0.889**	J	**0.935**	J	**0.917**	J	**0.881**	J	**4.16**		**3.95**	
Potassium	7440-09-7		ug/l	**2550**		**2550**		**2100**		**2130**		**2180**		**2110**		**13800**		**13100**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**48100**		**49700**		**24500**	J	**24700**	J	**25400**	J	**24400**	J	**36400**		**41200**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	**0.0101**	J	< 0.010	U	< 0.0100	U	< 0.0100	U
Uranium-238	7440-61-2	30	ug/l	**0.409**		**0.465**		**3.67**		**3.42**		**4.23**		**3.74**		**0.0743**	J	**0.107**	J
Sum U-235/U-238		30	ug/l	**0.409**		**0.465**		**3.67**		**3.42**		**4.24**		**3.74**		**0.074**		**0.107**	
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**5.15**	J	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

de maximis, inc.
ddms

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S04		MW-S04		MW-S06		MW-S06		MW-S07		MW-S07		MW-S08		MW-S08	
			Sample Date	11/13/2019		11/13/2019		11/14/2019		11/14/2019		11/11/2019		11/11/2019		11/13/2019		11/13/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	**22.6**	J	< 19.3	U	**27.1**	J	**88.5**		**685**		**394**		**366**	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	**1.14**	J	**1.16**	J	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	**2.57**	J
Barium	7440-39-3	2000	ug/l	**15.7**		**14.5**		**15.5**		**15.6**		**24.3**		**27.6**		**6.06**		**10.1**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**6530**		**6360**		**17900**		**18700**		**21400**		**20700**		**3460**		**3330**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	**0.343**	J	< 0.300	U	**0.848**	J
Copper	7440-50-8	1300	ug/l	**0.84**	J	< 2.00	U	**0.343**	J	< 2.00	U	**0.788**	J	**2.26**		**0.795**	J	< 2.00	U
Iron	7439-89-6	14000	ug/l	< 33.0	U	< 33.0	U	< 33.0	U	< 33.0	U	**97**	J	**714**		< 33.0	U	**497**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	**0.596**	J	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**545**		**521**		**4420**		**4610**		**5470**		**5220**		**515**		**552**	
Manganese	7439-96-5	300	ug/l	**1.05**	J	**1.29**	J	**1.12**	J	**1.81**	J	**3.28**	J	**12.4**		**32.2**		**357**	
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 1.00	U	< 0.200	U	**0.222**	J	< 0.200	U	< 1.00	U
Nickel	7440-02-0		ug/l	**0.678**	J	< 0.600	U	**0.905**	J	**0.947**	J	**4.18**		**4.8**		**1.11**	J	**1.43**	J
Potassium	7440-09-7		ug/l	**2630**		**2410**		**2760**		**2870**		**3550**		**3520**		**6890**	J	**6060**	J
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**4760**		**4960**		**19900**		**20900**		**21900**		**21900**		**27100**		**27400**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	**0.926**	J	< 0.600	U	< 0.600	U	< 0.600	U	**0.892**	J
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	< 0.067	U	**0.0923**	J	**0.147**	J	**0.738**		**1.2**		< 0.067	U	< 0.212	U
Sum U-235/U-238		30	ug/l					**0.092**		**0.147**		**0.738**		**1.2**					
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 20.0	U	< 3.30	U	< 3.30	U	**8.92**	J
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**3.73**	J	**4.6**	J	**6.99**	J

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S09		MW-S09 (dup)		MW-S09		MW-S09 (dup)		MW-S11		MW-S11		MW-S12		MW-S12 (dup)	
			Sample Date	11/12/2019		11/12/2019		11/12/2019		11/12/2019		11/13/2019		11/13/2019		11/14/2019		11/14/2019	
			Fraction	D		D		T		T		D		T		D		D	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**104**		**73.9**		**742**		**827**		< 19.3	U	**36.7**	J	**45.2**	J	**45.1**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**16.5**		**16**		**22**		**21.2**		**6.19**		**6.47**		**13.7**		**14**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**15700**		**15500**		**16300**		**15300**		**2630**		**2680**		**3630**		**3700**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	**1.51**		**1.65**		< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	**0.693**	J	**0.421**	J	**1.59**	J	**1.39**	J	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Iron	7439-89-6	14000	ug/l	**131**		**100**		**1130**		**1140**		< 33.0	U	**34.9**	J	< 33.0	U	< 33.0	U
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	**0.502**	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**4000**	J	**3860**	J	**3770**		**3390**	J	**727**		**755**		**925**		**966**	
Manganese	7439-96-5	300	ug/l	**2.85**	J	**2.6**	J	**19.4**	J	**20.2**		**1.83**	J	**2.02**	J	**1.51**	J	**1.64**	J
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Nickel	7440-02-0		ug/l	< 2.00	U	< 2.00	U	**2.6**		**2.16**		< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Potassium	7440-09-7		ug/l	**2780**		**2930**		**3140**		**3140**		**2530**		**2630**		**2390**		**2390**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**40700**	J	**41000**	J	**39300**	J	**36600**	J	**2900**		**2950**		**7210**		**7150**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.0100	U	< 0.0100	U	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**0.0706**	J	**0.101**	J	**0.257**		**0.277**		< 0.067	U	< 0.067	U	< 0.067	U	< 0.067	U
Sum U-235/U-238		30	ug/l	**0.071**		**0.101**		**0.257**		**0.277**									
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	**4.22**	J	**4.56**	J	< 3.30	U	< 3.30	U	**5.92**	J	**6.5**	J	**3.61**	J	**5.56**	J
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	**3.92**	J	**3.63**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S12		MW-S12 (dup)		MW-S14		MW-S14		MW-S15		MW-S15		MW-S16		MW-S16 (dup)	
			Sample Date	11/14/2019		11/14/2019		11/12/2019		11/12/2019		11/15/2019		11/15/2019		11/12/2019		11/12/2019	
			Fraction	T		T		D		T		D		T		D		D	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**220**		**230**		**125**		**3160**		**185**		**188**		**21.5**	J	**133**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**14.5**		**14.8**		**2.88**	J	**25.7**		**580**		**581**		**5.16**		**5.58**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	**0.213**	J	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**3620**		**3630**		< 80.0		< 6040	U	**58600**		**62500**		**17500**		**18100**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	**5.63**	J	**3.21**	J	**3.35**	J	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	< 0.300	U	**2.11**		**12.3**		**12.1**		< 0.300	U	**0.331**	J
Copper	7440-50-8	1300	ug/l	< 0.300	U	< 2.00	U	**0.316**	J	**4.41**		**1.49**	J	**1.28**	J	**21.4**		**24.5**	
Iron	7439-89-6	14000	ug/l	**35.3**	J	**46.7**	J	**95.1**	J	**3220**		**476**		**513**		< 33.0	UJ	**167**	J
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	**1.9**	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**952**		**957**		**1470**		**2180**		**12500**		**12500**		**4130**		**4240**	J
Manganese	7439-96-5	300	ug/l	**2.95**	J	**2.92**	J	**3.31**	J	**57.9**		**1080**		**1150**		**2.99**	J	**5.06**	
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	**3.6**		**3.56**	
Nickel	7440-02-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	**5.53**		**12.5**		**12.1**		< 2.00	U	< 2.00	U
Potassium	7440-09-7		ug/l	**2430**		**2390**		**781**		**1630**		**6540**		**6450**		**2780**		**2930**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**7350**		**7090**		**6830**		**6690**		**452000**	J	**476000**	J	**26500**		**27600**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	**0.95**	J	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U	**0.195**		**0.217**	
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	< 0.067	U	< 0.0670	U	**0.748**		< 0.067	U	< 0.067	U	**94.3**		**103**	
Sum U-235/U-238		30	ug/l							**0.748**						**94.5**		**103**	
U-235/U-238 Ratio			ug/l													**0.21%**		**0.21%**	
Vanadium	7440-62-2		ug/l	< 20.0	U	< 20.0	U	**3.83**	J	**6.96**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	**4.75**	J	**10.9**	J	**8.27**	J	**7.9**	J	**4.33**	J	**5.07**	J

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S16		MW-S16 (dup)		MW-S17		MW-S17		MW-S18		MW-S18		MW-S19		MW-S19	
			Sample Date	11/12/2019		11/12/2019		11/12/2019		11/12/2019		11/11/2019		11/11/2019		11/11/2019		11/11/2019	
			Fraction	T		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**188**	J	**130**	J	**29**	J	**119**		**361**		**345**		**20.9**	J	**106**	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	**1.09**	J	**1.17**	J	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	**15.1**		**15.9**		< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**5.8**		**5.66**		**20.7**		**21.6**		**20.2**		**20.4**		**3.95**	J	**4.21**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**17300**		**17900**		**21900**		**22600**		**29500**		**29200**		**2630**		**2320**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**0.363**	J	< 0.300	U	< 0.300	U	< 0.300	U	**1.76**		**1.64**		< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	**26.4**		**24.5**		**0.681**	J	**0.408**	J	**1.48**	J	**2.89**		**0.549**	J	**0.32**	J
Iron	7439-89-6	14000	ug/l	**232**	J	**149**	J	**47.6**	J	**178**		**6290**		**6090**		< 33.0	U	**108**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**3740**		**3720**	J	**5940**	J	**5290**	J	**1060**		**1040**		**306**		**295**	
Manganese	7439-96-5	300	ug/l	**6.01**		**5.03**		**1.37**	J	**3.89**	J	**240**		**234**		< 1.00	U	**1.89**	J
Molybdenum	7439-98-7	100	ug/l	**3.75**		**3.71**		< 0.200	U	< 1.00	U	**36.7**		**36.6**		< 0.200	U	< 0.200	U
Nickel	7440-02-0		ug/l	**1.77**	J	**1.84**	J	< 2.00	U	**1.19**	J	**5.09**		**4.85**		< 2.26	U	< 0.600	U
Potassium	7440-09-7		ug/l	**2870**		**2790**		**3060**		**3060**		**2120**		**2220**		**8880**		**8520**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**25100**		**25300**		**24300**		**24400**		**1700**		**1850**		**2770**		**2710**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	**0.21**		**0.201**		< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**100**		**98.8**		**0.296**		**0.46**		**0.848**		**0.849**		< 0.067	U	< 0.067	U
Sum U-235/U-238		30	ug/l	**100**		**99.0**		**0.296**		**0.460**		**0.848**		**0.849**					
U-235/U-238 Ratio			ug/l	**0.21%**		**0.20%**													
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 20.0	U	**3.56**	J	< 20.0	U	**5.19**	J
Zinc	7440-66-6		ug/l	**4.38**	J	**5.57**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

de maximis, inc.
ddms

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S20		MW-S20		MW-S21		MW-S21		MW-S22		MW-S22		MW-S23		MW-S23	
			Sample Date	11/12/2019		11/12/2019		11/14/2019		11/14/2019		11/13/2019		11/13/2019		11/13/2019		11/13/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**111**		**982**		< 19.3	U	< 19.3	U	**273**		**2240**		**71.7**		**2030**	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 8.17	U	**8.72**		< 2.00	U	< 2.00	U	< 2.00	U	**3.6**	J	**3.38**	J	**5.89**	
Barium	7440-39-3	2000	ug/l	**20.2**		**24**		**1.59**	J	**1.74**	J	**15.4**		**28.2**		**15.8**		**26.6**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	**0.25**	J	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**29800**		**28700**		**3530**		**3640**		**8600**		**9040**		**4520**		**4860**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	**3.77**	J	< 3.00	U	< 3.00	U	< 3.00	U	**4.98**	J	< 3.00	U	**17**	
Cobalt	7440-48-4	6.0	ug/l	**1.44**		**2.15**		< 0.300	U	< 0.300	U	**0.863**	J	**8.83**		**0.543**	J	**2.03**	
Copper	7440-50-8	1300	ug/l	< 0.300	U	**2.09**		**0.533**	J	< 0.300	U	**1.03**	J	**4.36**		**0.953**	J	**3.34**	
Iron	7439-89-6	14000	ug/l	**13200**		**13700**		< 33.0	U	< 33.0	U	**305**		**2590**		**67**	J	**2550**	
Lead	7439-92-1		ug/l	< 0.500	U	**0.827**	J	< 0.500	U	< 0.500	U	< 0.500	U	**1.51**	J	< 0.500	U	**1.01**	J
Magnesium	7439-95-4		ug/l	**1250**		**1370**		**576**		**576**		**1820**		**2430**		**367**		**947**	
Manganese	7439-96-5	300	ug/l	**549**	J	**489**	J	< 1.00	U	**1.95**	J	**20.4**		**183**		**3.98**	J	**48.6**	
Molybdenum	7439-98-7	100	ug/l	**1.02**		**1.23**		< 0.200	U	< 0.200	U	< 0.200	U	< 1.00	U	**0.455**	J	**1.63**	
Nickel	7440-02-0		ug/l	< 0.600	U	**1.74**	J	< 0.600	U	< 0.600	U	**2.9**		**5.56**		**0.948**	J	**4.81**	
Potassium	7440-09-7		ug/l	**1760**		**1920**		**557**		**570**		**4230**		**4460**		**10500**		**9670**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**6500**		**6420**		**3190**		**3140**		**24700**		**26900**		**44500**		**46800**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	**0.74**	J	< 0.700	U	**0.957**	J
Uranium-235	15117-96-1	30	ug/l	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**0.311**		**0.483**		< 0.067	U	< 0.067	U	< 0.067	U	**0.429**		**0.0738**	J	**0.441**	
Sum U-235/U-238		30	ug/l	**0.311**		**0.483**								**0.429**		**0.074**		**0.441**	
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 20.0	U	**5.54**	J	**4.45**	J	**3.93**	J	< 3.30	U	**14**	J	**4.78**	J	**13.6**	J
Zinc	7440-66-6		ug/l	< 3.30	U	**3.61**	J	< 3.30	U	< 3.30	U	< 3.30	U	**7.98**	J	**27.4**		**35.6**	

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S24		MW-S24		MW-S26		MW-S26		MW-S27		MW-S27		MW-S28		MW-S28	
			Sample Date	11/13/2019		11/13/2019		11/15/2019		11/15/2019		11/13/2019		11/13/2019		11/14/2019		11/14/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	42.1	J	169		368		732		49.2	J	60.3		46.7	J	5290	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	1.14	J	1.15	J	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	2.32	J	< 2.00	U	< 2.00	U	< 2.00	U	6.2	
Barium	7440-39-3	2000	ug/l	7.96		8.86		181		191		19.3		19.8		3.29	J	33.5	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	0.268	J
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	0.628	J	0.69	J	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	22300		21500		17300		18200		21600		23000		5100		5860	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	3.54	J	4.32	J	< 3.00	U	< 3.00	U	< 3.00	U	11.4	
Cobalt	7440-48-4	6.0	ug/l	1.05		1.33		10.5		11.9		< 0.300	U	< 0.300	U	< 0.300	U	2.88	
Copper	7440-50-8	1300	ug/l	28.1		34.2		5.34		6.93		0.458	J	< 2.00	U	0.402	J	6.49	
Iron	7439-89-6	14000	ug/l	59.9	J	276		241		2250		83.2	J	96.9	J	52.6	J	5240	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	3.35	
Magnesium	7439-95-4		ug/l	9580		11500		4250		4530		4990		5130		1050		2460	
Manganese	7439-96-5	300	ug/l	23.4		30.8		804		894		2.95	J	3.26	J	2.21	J	122	
Molybdenum	7439-98-7	100	ug/l	356		373		< 0.200	U	0.288	J	0.268	J	0.254	J	< 0.200	U	0.779	J
Nickel	7440-02-0		ug/l	2.05		2.48		13.5		14.1		1.32	J	1.29	J	< 0.600	U	6.42	
Potassium	7440-09-7		ug/l	2670		2940		3430		3590		2900		3090		927		2240	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	19100		20600		188000	J	196000	J	25100		26300		5150		5500	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	1.53	J
Uranium-235	15117-96-1	30	ug/l	5.06		5.35		< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	2360		2670		< 0.067	U	< 0.200	U	< 0.200	U	0.0815	J	< 0.067	U	0.591	
Sum U-235/U-238		30	ug/l	2365		2675								0.082				0.591	
U-235/U-238 Ratio			ug/l	0.21%		0.20%													
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	3.56	J	< 20.0	U
Zinc	7440-66-6		ug/l	4.45	J	5.28	J	28.3		29.2		< 3.30	U	< 3.30	U	7.55	J	21.7	

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S29		MW-S29		MW-S30		MW-S30		MW-S32		MW-S32		MW-S35		MW-S35	
			Sample Date	11/13/2019		11/13/2019		11/15/2019		11/15/2019		11/13/2019		11/13/2019		11/12/2019		11/12/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**25.2**	J	**165**		< 19.3	U	**37.1**	J	< 19.3	U	**597**		< 19.3	UJ	< 19.3	UJ
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	**1.14**	J	**1.2**	J	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	**3.01**	J	**2.76**	J	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 5.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**4.53**		**4.9**		**16.3**		**16.9**		**15.8**		**20**		**121**		**127**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**5250**		**5360**		**21000**		**20500**		**17400**		**18200**		**85700**		**82200**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**8.67**		**9.07**		< 0.300	U	< 0.300	U	**1.73**		**2.81**		< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	< 0.300	U	< 2.00	U	**0.341**	J	< 0.300	U	**0.789**	J	**2.16**		**0.395**	J	< 0.300	U
Iron	7439-89-6	14000	ug/l	< 33.0	U	**141**		< 33.0	U	**50.6**	J	**35.8**	J	**855**		< 33.0	UJ	**33.9**	J
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	**0.661**	J	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**812**		**877**		**5520**		**5550**		**5770**		**6050**		**15500**		**15800**	
Manganese	7439-96-5	300	ug/l	**1.21**	J	**3.18**	J	< 1.00	U	**1.38**	J	< 1.00	U	**19.5**		**1.86**	J	**2.42**	J
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	**0.337**	J	**0.384**	J	< 0.200	U	< 0.200	U
Nickel	7440-02-0		ug/l	**1.22**	J	**1.23**	J	**1.13**	J	**1.2**	J	**1.28**	J	**2.49**		< 2.74	U	**2.7**	
Potassium	7440-09-7		ug/l	**2670**		**2890**		**3000**		**3050**		**3380**		**3730**		**6080**		**5690**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**15300**		**16200**		**21100**		**20400**		**11500**		**11600**		**161000**		**161000**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.0100	U	< 0.0100	U
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	< 0.067	U	< 0.067	U	**0.0677**	J	< 0.067	U	**0.164**	J	< 0.0670	U	< 0.0670	U
Sum U-235/U-238		30	ug/l							**0.068**				**0.164**					
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	**4.44**	J	**5.27**	J	< 3.30	U	< 3.30	U	< 3.30	U	**3.87**	J	**4.09**	J	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**3.83**	J	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S36		MW-S36		MW-S37		MW-S37		MW-S38		MW-S38		MW-S39		MW-S39	
			Sample Date	11/11/2019		11/11/2019		11/13/2019		11/13/2019		11/13/2019		11/13/2019		11/14/2019		11/14/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	**40.4**	J	**176**		**1380**		< 19.3	U	**49.7**	J	**164**	J	< 19.3	UJ
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	**2.51**	J	**3.51**	J	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**103**		**101**		**15.6**		**23.2**		**26.7**		**27.4**		**39.1**		**37.4**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	**0.402**	J	**0.448**	J	< 0.300	U	< 0.300	U	**0.469**	J	**0.613**	J	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**47200**		**44600**		**26100**		**27600**		**27900**		**29400**		**28700**		**28600**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**14**		**16.8**		**1.38**		**2.11**		**14.3**		**15.9**		**5.09**		**4.94**	
Copper	7440-50-8	1300	ug/l	**1.66**	J	**1.26**	J	**0.5**	J	**2.06**		**0.882**	J	< 2.00	U	**0.577**	J	< 0.300	U
Iron	7439-89-6	14000	ug/l	< 33.0	U	**111**		**318**		**1710**		< 33.0	U	**74.3**	J	**196**	J	< 33.0	UJ
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	**0.837**	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**11100**		**9590**		**5920**		**6330**		**7010**		**7250**		**5130**		**5180**	
Manganese	7439-96-5	300	ug/l	**3140**		**3160**		**75.4**		**93.8**		**3760**		**3830**		**10.7**	J	**7.05**	J
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	**0.235**	J	**0.439**	J	< 1.00	U	**0.211**	J	**0.201**	J	< 0.200	U	< 0.200	U
Nickel	7440-02-0		ug/l	**10.9**		**11.1**		**1.46**	J	**2.92**		**19.4**		**20.6**		**3.65**	J	**3.26**	J
Potassium	7440-09-7		ug/l	**7460**		**6990**		**5130**		**5680**		**4200**		**4460**		**5900**		**5790**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**198000**		**218000**		**28900**		**29400**		**17600**		**18400**		**84400**		**83400**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	**0.836**	J	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**0.112**	J	**0.0902**	J	**0.615**		**0.808**	J+	< 0.200	U	**0.146**	J	**0.114**	J	**0.0819**	J
Sum U-235/U-238		30	ug/l	**0.112**		**0.090**		**0.615**		**0.808**				**0.146**		**0.114**		**0.082**	
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 20.0	U	< 3.30	U	< 3.30	U	**4.9**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	**6.04**	J	**6.29**	J	< 3.30	U	**5.18**	J	**3.68**	J	< 3.30	U	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S40		MW-S40		MW-SD01		MW-SD01		MW-SD02		MW-SD02		MW-SD06		MW-SD06	
			Sample Date	11/14/2019		11/14/2019		11/14/2019		11/14/2019		11/12/2019		11/12/2019		11/14/2019		11/14/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**25.5**	J	**47.4**	J	< 19.3	U	**219**		< 19.3	UJ	**764**		< 19.3	U	**124**	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 5.00	U	**2.31**	J	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**24.5**		**25.8**		**15.3**		**16**		**21.3**		**30.5**		**35.4**		**35.8**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	**0.453**	J	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**25300**		**25700**		**14400**		**14200**		**19700**		**20700**		**29900**		**30100**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**0.816**	J	**0.895**	J	**2.02**		**2.16**		< 0.300	U	**0.637**	J	**0.641**	J	**0.773**	J
Copper	7440-50-8	1300	ug/l	**0.618**	J	< 2.00	U	**2.47**		**3.27**		**2.56**		**7.16**		**2.02**		**2.57**	
Iron	7439-89-6	14000	ug/l	**1260**		**1560**		< 33.0	U	**292**		< 33.0	UJ	**923**		< 33.0	U	**188**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	**0.678**	J	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**5390**		**5430**		**2970**		**3030**		**7410**		**7450**		**10000**		**10100**	
Manganese	7439-96-5	300	ug/l	**15100**		**16200**		**2.36**	J	**7.86**		**3.78**	J	**15.8**		**2.07**	J	**5.48**	
Molybdenum	7439-98-7	100	ug/l	< 1.00	U	< 1.00	U	**25.9**		**25.1**		< 0.200	U	< 0.200	U	< 1.00	U	< 1.00	U
Nickel	7440-02-0		ug/l	**7.19**		**8**		**1.13**	J	**1.36**	J	< 2.05	U	**3.15**		**1.88**	J	**1.91**	J
Potassium	7440-09-7		ug/l	**4080**		**4130**		**3370**		**3360**		**3350**		**3870**		**5670**		**5770**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**24000**		**24500**		**25900**		**25200**		**30300**		**33200**		**23900**		**23400**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	**0.0162**	J	**0.017**	J	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	**0.11**	J	**7.24**		**7.83**		< 0.0670	U	**0.391**		**1.15**		**1.22**	
Sum U-235/U-238		30	ug/l			**0.110**		**7.26**		**7.85**				**0.391**		**1.15**		**1.22**	
U-235/U-238 Ratio			ug/l					**0.22%**		**0.22%**									
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**4.33**	J	**4.01**	J	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**4.5**	J	**11.1**	J	< 3.30	U	**3.72**	J

de maximis, inc.
ddms

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-SD10		MW-SD10		MW-SD13		MW-SD13		MW-SD17		MW-SD17		MW-SD26		MW-SD26	
			Sample Date	11/12/2019		11/12/2019		11/12/2019		11/12/2019		11/12/2019		11/12/2019		11/18/2019		11/18/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	UJ	**209**		**112**		**360**		< 19.3	UJ	**106**		< 19.3	U	**20.9**	J
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	**1.1**	J	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 5.00	U	**2.07**	J	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	**2.13**	J	**2.24**	J
Barium	7440-39-3	2000	ug/l	**12.2**		**12.6**		**8.1**		**9.84**		**17.8**		**18.5**		**22.3**		**22.3**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**13800**		**13600**		**22100**		**20000**		**19800**		**19800**		**37300**		**37100**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	**0.409**	J	**0.583**	J	< 0.300	U	< 0.300	U	**1.08**		**1.11**	
Copper	7440-50-8	1300	ug/l	**0.351**	J	**0.511**	J	**1.97**	J	**1.05**	J	**0.44**	J	**0.555**	J	**0.709**	J	**0.525**	J
Iron	7439-89-6	14000	ug/l	< 33.0	UJ	**234**		**114**		**388**		< 33.0	UJ	**185**		< 33.0	U	**47.7**	J
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**2810**		**2880**		**3320**		**3070**		**4930**		**4640**		**5760**		**5760**	
Manganese	7439-96-5	300	ug/l	< 1.00	U	**4.25**	J	**3.86**	J	**9.58**		**1.32**	J	**3.9**	J	**1**	J	**1.33**	J
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	< 0.200	U	**4.19**		**3.99**		< 0.200	U	< 0.200	U	**0.273**	J	**0.265**	J
Nickel	7440-02-0		ug/l	**0.86**	J	**1.26**	J	< 2.00	U	**1.84**	J	< 2.00	U	**1.6**	J	**2.38**		**2.32**	
Potassium	7440-09-7		ug/l	**1830**		**1860**		**2500**		**2380**		**3580**		**3550**		**3550**		**3570**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**20800**		**22500**		**16900**		**16800**		**22800**		**21900**		**23400**		**23600**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.0100	U	< 0.0100	U	< 0.0100	U	< 0.0100	U	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	< 0.0670	U	**0.0805**	J	< 0.0670	U	< 0.0670	U	< 0.0670	U	**0.142**	J	**0.109**	J+	**0.129**	J+
Sum U-235/U-238		30	ug/l			**0.081**								**0.142**		**0.109**		**0.129**	
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	**5.14**	J	**3.32**	J	< 20.0	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	**7.89**	J	< 3.30	U	< 3.30	U	**5.43**	J	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-SD27		MW-SD27		MW-SD29		MW-SD29		MW-SD30		MW-SD30		MW-SD32		MW-SD32	
			Sample Date	11/12/2019		11/12/2019		11/14/2019		11/14/2019		11/12/2019		11/12/2019		11/15/2019		11/15/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	UJ	< 19.3	UJ	< 19.3	U	**382**		< 19.3	UJ	< 19.3	UJ	**51.9**		**2050**	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 5.00	U	< 2.00	U	< 2.00	U	**2.15**	J	< 2.00	U	< 2.00	U	< 2.00	U	**5.05**	
Barium	7440-39-3	2000	ug/l	**22**		**21.7**		**11.3**		**13**		**20**		**19.2**		**14.7**		**28.8**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	**0.306**	J	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**25200**		**26600**		**21800**		**21800**		**22700**		**22600**		**14200**		**14800**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	**4.4**	J
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	**0.329**	J	**0.731**	J	< 0.300	U	< 0.300	U	< 0.300	U	**2.99**	
Copper	7440-50-8	1300	ug/l	**0.441**	J	< 0.300	U	**0.495**	J	< 2.00	U	< 0.300	U	< 0.300	U	**0.621**	J	**5.58**	
Iron	7439-89-6	14000	ug/l	< 33.0	UJ	< 33.0	UJ	< 33.0	U	**471**		< 33.0	UJ	< 33.0	UJ	**77.2**	J	**2450**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	**1.58**	J
Magnesium	7439-95-4		ug/l	**6240**		**5830**		**6860**		**7140**		**5950**	J	**4990**	J	**3890**		**4190**	
Manganese	7439-96-5	300	ug/l	< 1.00	U	< 1.00	U	**3.28**	J	**15.2**		< 1.00	U	< 1.00	U	**5.44**		**102**	
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	< 0.200	U	**19.1**		**18.2**		< 0.200	U	< 0.200	U	**0.25**	J	**0.518**	J
Nickel	7440-02-0		ug/l	< 2.00	U	**0.96**	J	**1.21**	J	**1.46**	J	**9.36**		**9.39**		**1.95**	J	**4.7**	
Potassium	7440-09-7		ug/l	**3410**		**3380**		**3520**		**3550**		**2970**		**2870**		**2500**		**3180**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**31500**		**30500**		**31300**		**31700**		**31700**		**28900**		**12100**		**12400**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U	< 0.0100	U	< 0.0100	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	< 0.0670	U	< 0.0670	U	< 0.067	U	**0.0748**	J	< 0.0670	U	< 0.0670	U	< 0.067	U	**0.283**	
Sum U-235/U-238		30	ug/l							**0.075**								**0.283**	
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	**4.44**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**4.49**	J
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**7.84**	J

de maximis, inc.
ddms

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-SD34		MW-SD34		MW-SD35		MW-SD35		MW-SD36		MW-SD36 (dup)		MW-SD36		MW-SD36 (dup)	
			Sample Date	11/14/2019		11/14/2019		11/13/2019		11/13/2019		11/18/2019		11/18/2019		11/18/2019		11/18/2019	
			Fraction	D		T		D		T		D		D		T		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	< 19.3	U	41.3	J	685		234		231		2350		2160	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	2.48	J	< 2.00	U	< 2.00	U	2.34	J	2.9	J	2.86	J	5.86		5.47	
Barium	7440-39-3	2000	ug/l	26.4		27		51.9		54		61.9		59.1		62.4		61	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	106000	J	88800	J	32100		30500		47200		45300		48800		47000	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	4.59	J	3.08	J	1.11		1.57		< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	< 0.300	U	< 2.00	U	0.922	J	< 2.00	U	< 0.300	U	0.351	J	1.1	J	0.892	J
Iron	7439-89-6	14000	ug/l	6030		4090		17900		17900		13700		13300		33200		30000	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	0.683	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	33900	J	26200	J	11600		10600		10900		10600		13500		13200	
Manganese	7439-96-5	300	ug/l	715	J	437	J	772	J	758	J	587		570		988		941	
Molybdenum	7439-98-7	100	ug/l	< 1.00	U	< 1.00	U	0.358	J	< 1.00	U	0.926	J	0.944	J	< 1.03	U	0.912	J
Nickel	7440-02-0		ug/l	8.81	J	7.45	J	0.796	J	1.65	J	< 0.600	U	< 0.600	U	0.736	J	0.744	J
Potassium	7440-09-7		ug/l	10700		10300		6290		5710		6570		6520		6580		6410	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	39100	J	34700	J	13400		13500		20000		19700		19500		19100	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	0.0865		0.0953		< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	11.8		12.8		< 0.067	U	< 0.200	U	< 0.067	U	< 0.067	U	< 0.067	U	< 0.067	U
Sum U-235/U-238		30	ug/l	11.9		12.9													
U-235/U-238 Ratio			ug/l	0.73%		0.74%													
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	18.2	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

de maximis, inc.
ddms

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-SD37		MW-SD37		MW-SD38		MW-SD38		MW-SD39		MW-SD39		MW-SD40		MW-SD40 (dup)	
			Sample Date	11/18/2019		11/18/2019		11/15/2019		11/15/2019		11/15/2019		11/15/2019		11/14/2019		11/14/2019	
			Fraction	D		T		D		T		D		T		D		D	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	**2.34**	J	**2.51**	J	< 5.00	U	< 5.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**26.5**		**29.4**		**45.5**		**46.5**		**136**		**142**		**58.1**		**58.4**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	**0.48**	J	**0.475**	J	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**30400**		**31200**		**21900**		**22300**		**62700**		**66200**		**34500**		**35100**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**1.54**		**1.62**		**2.33**		**2.33**		**10.5**	J	**9.38**	J	**1.03**		**1.04**	
Copper	7440-50-8	1300	ug/l	**0.323**	J	**0.358**	J	< 0.300	U	**0.599**	J	**0.576**	J	< 2.00	U	< 0.300	U	< 0.300	U
Iron	7439-89-6	14000	ug/l	**2990**		**3150**		**3250**		**3340**	J	**154**		**163**		**39.2**	J	**36.7**	J
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**9920**		**9860**		**8510**		**8710**		**17200**		**15500**		**14400**		**14500**	
Manganese	7439-96-5	300	ug/l	**227**		**240**		**308**		**311**		**2160**		**2280**		**218**		**222**	
Molybdenum	7439-98-7	100	ug/l	**0.387**	J	**0.399**	J	< 0.200	U	< 0.200	U	< 0.200	U	**0.575**	J	< 0.200	U	< 0.200	U
Nickel	7440-02-0		ug/l	**5.32**		**5.36**		**4.41**		**4.48**		**28.7**		**28.1**		**2.57**		**2.52**	
Potassium	7440-09-7		ug/l	**4710**		**5050**		**5220**		**5320**		**7260**		**7440**		**9840**		**9510**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**15500**		**16000**		**22500**		**23000**	J	**137000**		**141000**		**15800**	J	**15800**	J
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**0.0853**	J	**0.0811**	J+	< 0.067	U	< 0.067	U	< 0.067	U	< 0.067	U	**0.491**		**0.502**	
Sum U-235/U-238		30	ug/l	**0.085**		**0.081**										**0.491**		**0.502**	
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	**3.51**	J	< 3.30	U	< 3.30	U	< 3.30	U	**4.44**	J	**4.51**	J	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-SD40		MW-SD40 (dup)		MW-SD41		MW-SD41 (dup)		MW-SD41		MW-SD41 (dup)		MW-SD42A		MW-SD42A	
			Sample Date	11/14/2019		11/14/2019		11/15/2019		11/15/2019		11/15/2019		11/15/2019		11/15/2019		11/15/2019	
			Fraction	T		T		D		D		T		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	**54**	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**58.3**		**59**		**10.7**		**11.1**		**11.3**		**11.1**		**20.2**		**20.6**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**34400**		**34700**		**23300**		**23800**		**23900**		**23700**		**27600**		**28600**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	**4.01**	J	**4.65**	J	**3.49**	J	**5.1**	J	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**1.1**		**1.08**		**2.38**		**2.45**		**2.69**		**2.62**		**3.23**		**3.65**	
Copper	7440-50-8	1300	ug/l	**0.353**	J	< 0.300	U	**0.335**	J	**0.415**	J	**0.543**	J	**0.442**	J	**0.398**	J	**0.955**	J
Iron	7439-89-6	14000	ug/l	**65.6**	J	**62.6**	J	**129**		**132**		**149**		**148**		**887**		**848**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**14300**		**14500**		**7760**		**8050**		**7950**		**7890**		**6290**		**6240**	
Manganese	7439-96-5	300	ug/l	**221**		**226**		**55.9**		**56.9**		**63.7**		**62.8**		**1030**		**1130**	
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	< 0.200	U	**0.412**	J	**0.397**	J	**0.415**	J	**0.407**	J	**0.309**	J	**0.285**	J
Nickel	7440-02-0		ug/l	**2.41**		**2.38**		**3.83**		**4.36**		**3.81**		**4.48**		**8.44**		**9.68**	
Potassium	7440-09-7		ug/l	**10100**		**9510**		**3300**		**3380**		**3410**		**3330**		**4990**		**5010**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**15700**	J	**15900**	J	**18600**	J	**19100**	J	**18900**	J	**18800**	J	**21300**	J	**22500**	J
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**0.496**		**0.523**		**0.448**		**0.446**		**0.479**		**0.459**		< 0.200	U	< 0.236	U
Sum U-235/U-238		30	ug/l	**0.496**		**0.523**		**0.448**		**0.446**		**0.479**		**0.459**					
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-SD43		MW-SD43		MW-SD44		MW-SD44		MW-SD45		MW-SD45		MW-SD46		MW-SD46 (dup)	
			Sample Date	11/15/2019		11/15/2019		11/15/2019		11/15/2019		11/14/2019		11/14/2019		11/18/2019		11/18/2019	
			Fraction	D		T		D		T		D		T		D		D	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	**531**		< 19.3	U	**1090**		< 19.3	U	**33.9**	J	**29.7**	J	< 19.3	U
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	**1.46**	J	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	**2.15**	J	**3.26**	J	**12**		< 2.00	U	< 2.00	U	**2.12**	J	**2.08**	J
Barium	7440-39-3	2000	ug/l	**10.7**		**14.2**		**46.9**		**115**		**20.9**		**19.8**		**68.4**		**68.2**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	**0.514**		< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**27000**		**27900**		**22700**		**23500**		**25300**		**23100**		**28700**	J	**25800**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**0.724**	J	**0.899**	J	**2.5**		**3.19**		**4.86**		**4.49**		**3.38**		**3.43**	
Copper	7440-50-8	1300	ug/l	**0.358**	J	< 2.00	U	< 0.300	U	**2.2**		**0.471**	J	< 2.00	U	**0.33**	J	< 0.300	U
Iron	7439-89-6	14000	ug/l	**1260**	J	**605**	J	**5180**		**10800**		< 33.0	U	**63.5**	J	**3490**		**3640**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	**1.84**	J	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**9790**		**9870**		**8470**		**8570**		**6920**		**6410**		**9860**		**9880**	
Manganese	7439-96-5	300	ug/l	**62.8**		**70.2**		**309**		**327**		**1590**		**1640**		**148**		**150**	
Molybdenum	7439-98-7	100	ug/l	**0.218**	J	< 0.200	U	**0.58**	J	**0.699**	J	< 0.200	U	< 0.200	U	**0.549**	J	**0.469**	J
Nickel	7440-02-0		ug/l	**1.92**	J	**2.5**		**5.03**		**7.41**		**7.39**	J	**6.51**	J	< 0.600	U	< 0.600	U
Potassium	7440-09-7		ug/l	**6020**		**5790**		**7890**		**8220**		**4150**		**3780**		**6380**		**6040**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**15200**		**14600**		**18300**		**18400**		**24500**		**22300**		**24200**		**24500**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	**0.796**	J	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**0.118**	J	**0.188**	J	**0.099**	J	**0.562**		**0.118**	J	**0.131**	J	< 0.067	U	< 0.067	U
Sum U-235/U-238		30	ug/l	**0.118**		**0.188**		**0.099**		**0.562**		**0.118**		**0.131**					
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	**3.97**	J	**12**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-SD46		MW-SD46 (dup)		MW-SM13		MW-SM13		MW-SM46		MW-SM46		MW-T10		MW-T10	
			Sample Date	11/18/2019		11/18/2019		11/11/2019		11/11/2019		11/15/2019		11/15/2019		11/14/2019		11/14/2019	
			Fraction	T		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	27.6	J	26.5	J	697		21.8	J	< 19.3	U	< 19.3	U	< 19.3	U	123	
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	2.23	J	2.16	J	< 2.00	U	< 2.00	U	2.53	J	2.88	J	12.8		13	
Barium	7440-39-3	2000	ug/l	66.2		64.9		81		10.1		58.1		58.1		5.29		6.03	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	25500	J	25000		14600		13500		28800		28600		12800		12500	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	3.17	J	3.18	J	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	3.61		3.68		47.2		40.5		0.817	J	0.788	J	< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	0.38	J	0.312	J	4.58		3.29		< 0.300	U	0.34	J	< 0.300	U	< 2.00	U
Iron	7439-89-6	14000	ug/l	3610		3440		875		93.2	J	9660		10200		68.1	J	211	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	9760		9680		2420		2050		10900		11000		4160		4040	
Manganese	7439-96-5	300	ug/l	149		144		32.4		12.5		190		193		249		287	
Molybdenum	7439-98-7	100	ug/l	0.546	J	0.515	J	0.397	J	0.242	J	< 0.200	U	< 0.200	U	12.2		11.2	
Nickel	7440-02-0		ug/l	< 0.600	U	< 0.600	U	10.4		8.45		3.7		3.69		< 0.600	U	< 0.600	U
Potassium	7440-09-7		ug/l	6290		6410		2640		2330		4630		4690		1910		1860	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	24000		23500		39200		36700		22300	J	22400	J	12900		12500	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	< 0.067	U	0.243		0.136	J	< 0.067	U	< 0.067	U	< 0.067	U	0.0763	J
Sum U-235/U-238		30	ug/l					0.243		0.136								0.076	
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 20.0	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 20.0	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	4.15	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-T24		MW-T24		OW-2		OW-2		OW-3		OW-3		P-1		P-1	
			Sample Date	11/13/2019		11/13/2019		11/11/2019		11/11/2019		11/13/2019		11/13/2019		11/18/2019		11/18/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	**112**		**3300**		**457**		**465**		< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	**3.29**	J	< 2.00	U	**2.26**	J	**2.04**	J	**2.64**	J	**2.31**	J	**2.21**	J
Barium	7440-39-3	2000	ug/l	**92.3**		**106**		**97.2**		**92.8**		**36.6**		**37.8**		**14.4**		**14.7**	
Beryllium	7440-41-7		ug/l	< 0.200	U	**0.41**	J	**0.394**	J	**0.497**	J	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**149000**		**165000**		**14600**		**13800**		**7360**		**8030**		**33200**		**34300**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	**6.97**	J	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**1.37**		**2.92**		**0.605**	J	**0.568**	J	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	**1.52**	J	**12.5**		**0.519**	J	**0.374**	J	< 0.300	U	< 2.00	U	**0.423**	J	**0.396**	J
Iron	7439-89-6	14000	ug/l	**122**		**3830**		< 33.0	U	< 33.0	U	< 33.0	U	**135**		< 33.0	U	**44.9**	J
Lead	7439-92-1		ug/l	< 0.500	U	**4.6**		< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**35300**		**35100**		**3170**		**3130**		**1400**		**1520**		**8930**		**9100**	
Manganese	7439-96-5	300	ug/l	**1270**		**1460**		**81.8**		**77.8**		**1.75**	J	**2.12**	J	**1.1**	J	**4.44**	J
Molybdenum	7439-98-7	100	ug/l	**7.03**		**6.87**		< 0.200	U	< 0.200	U	**0.423**	J	< 1.00	U	**0.28**	J	**0.275**	J
Nickel	7440-02-0		ug/l	**3.01**		**6.38**		**5.19**		**4.73**		< 0.600	U	< 0.600	U	**1.1**	J	**1.05**	J
Potassium	7440-09-7		ug/l	**7060**		**7170**		**6940**		**7000**		**2280**		**2480**		**3230**		**3290**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**80000**		**88800**		**87000**		**97000**		**135000**		**136000**		**17500**		**17700**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	**0.78**	J	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	**0.0673**	J	**0.139**		< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	**25.9**		**59.7**		**0.0781**	J	**0.0774**	J	< 0.067	U	< 0.067	U	**0.0863**	J+	**0.132**	J+
Sum U-235/U-238		30	ug/l	**26**		**59.8**		**0.078**		**0.077**						**0.086**		**0.132**	
U-235/U-238 Ratio			ug/l	**0.26%**		**0.23%**													
Vanadium	7440-62-2		ug/l	< 3.30	U	**9.18**	J	< 20.0	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	**11.6**	J	**39**		**3.41**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	P-1A		P-1A		P-2		P-2		P-3		P-3		P-4		P-4	
			Sample Date	11/15/2019		11/15/2019		11/15/2019		11/15/2019		11/15/2019		11/15/2019		11/13/2019		11/13/2019	
			Fraction	D		T		D		T		D		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																
Aluminum	7429-90-5		ug/l	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Barium	7440-39-3	2000	ug/l	**16.9**		**15.5**		**15.9**		**16.1**		**15.2**		**15.4**		**23.6**		**21.4**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**27000**		**25600**		**17800**		**18000**		**18600**		**18300**		**26800**		**25600**	
Chromium	7440-47-3	100	ug/l	**3.51**	J	**3.43**	J	< 3.00	U	< 3.00	U	**3.52**	J	**3.38**	J	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	**0.514**	J	**0.497**	J	**0.481**	J	**0.346**	J	**0.591**	J	**0.464**	J	**0.56**	J	< 2.00	U
Iron	7439-89-6	14000	ug/l	< 33.0	U	**54.4**	J	< 33.0	U	**142**	J	**53.3**	J	**101**		< 33.0	U	< 33.0	U
Lead	7439-92-1		ug/l	**3.77**		**6.53**		< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**6160**		**5760**		**4430**		**4480**		**5040**		**5120**		**6500**		**6130**	
Manganese	7439-96-5	300	ug/l	**12.1**		**12.7**		< 1.00	U	**1.72**	J	< 1.00	U	**1.04**	J	< 1.00	U	**1**	J
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	< 0.200	U	**0.876**	J	**0.976**	J	**0.41**	J	**0.388**	J	**0.219**	J	< 1.00	U
Nickel	7440-02-0		ug/l	**2.84**		**2.68**		**0.985**	J	**0.934**	J	**2.41**		**2.24**		**1.18**	J	**0.901**	J
Potassium	7440-09-7		ug/l	**3340**		**3150**		**2990**		**2990**		**3170**		**3160**		**3460**		**3170**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**27200**	J	**25700**	J	**36700**		**36800**	J	**34800**	J	**34600**	J	**31900**		**33100**	
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	< 0.067	U	< 0.067	U	< 0.067	U	< 0.067	U	< 0.200	U	< 0.067	U	< 0.200	U
Sum U-235/U-238		30	ug/l																
U-235/U-238 Ratio			ug/l																
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	**3.59**	J	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**3.52**	J	< 3.30	U

Table 2.3 - Total and Dissolved Metals - Sitewide Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	PT-09		PT-09		PT-11P		PT-11P		PW-6		PW-6 (dup)		PW-6		PW-6 (dup)		SW-1		SW-1	
			Sample Date	11/18/2019		11/18/2019		11/13/2019		11/13/2019		11/13/2019		11/13/2019		11/13/2019		11/13/2019		11/14/2019		11/14/2019	
			Fraction	D		T		D		T		D		D		T		T		D		T	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																				
Aluminum	7429-90-5		ug/l	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U	< 19.3	U
Antimony	7440-36-0		ug/l	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U	< 1.00	U
Arsenic	7440-38-2	10	ug/l	**2.18**	J	**2.38**	J	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	**2.06**	J
Barium	7440-39-3	2000	ug/l	**26.7**		**25.7**		**36.1**		**34.4**		**28.6**		**27.8**		**26.5**		**27.3**		**23.8**		**25.2**	
Beryllium	7440-41-7		ug/l	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U
Cadmium	7440-43-9		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Calcium	7440-70-2		ug/l	**18000**		**18400**		**24300**		**24200**		**23600**		**24200**		**22900**		**23200**		**21400**		**21100**	
Chromium	7440-47-3	100	ug/l	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U	< 3.00	U
Cobalt	7440-48-4	6.0	ug/l	**1.47**		**1.47**		**0.679**	J	**0.683**	J	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Copper	7440-50-8	1300	ug/l	< 0.300	U	< 0.300	U	**0.701**	J	< 2.00	U	**0.537**	J	**0.656**	J	< 2.00	U	< 2.00	U	**67.4**		**118**	
Iron	7439-89-6	14000	ug/l	**2250**		**2350**		< 33.0	U	< 33.0	U	**3140**		**2790**		**6080**		**4880**		**2850**		**13600**	
Lead	7439-92-1		ug/l	< 0.500	U	< 0.500	U	< 0.500	U	< 0.500	U	**2.67**		**2.46**		**6.63**		**6.52**		< 0.500	U	< 0.500	U
Magnesium	7439-95-4		ug/l	**6060**		**5870**		**5790**		**5960**		**5830**		**5930**		**5380**		**5520**		**5790**		**5690**	
Manganese	7439-96-5	300	ug/l	**358**		**344**		< 1.00	U	< 1.00	U	**121**		**124**		**137**		**134**		**94.5**		**97.2**	
Molybdenum	7439-98-7	100	ug/l	< 0.200	U	**0.211**	J	< 0.200	U	< 0.200	U	< 0.200	U	< 0.200	U	< 1.00	U	< 0.200	U	**0.49**	J	**2.22**	
Nickel	7440-02-0		ug/l	**2.69**	J	**2.36**	J	**2.68**		**2.64**		**1.37**	J	**1.14**	J	**1.21**	J	**1.14**	J	**1.01**	J	**0.946**	J
Potassium	7440-09-7		ug/l	**3910**		**3800**		**3990**		**4170**		**2990**	J	**3100**		**2720**	J	**2770**		**3060**		**3010**	
Selenium	7782-49-2		ug/l	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Silver	7440-22-4		ug/l	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U	< 0.300	U
Sodium	7440-23-5		ug/l	**13700**		**14300**		**98600**		**99600**		**26600**		**27100**		**27000**		**27700**		**28300**	J	**28100**	J
Thallium	7440-28-0		ug/l	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U	< 0.600	U
Thorium	7440-29-1	0.33	ug/l	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U	< 0.700	U
Uranium-235	15117-96-1	30	ug/l	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U	< 0.010	U
Uranium-238	7440-61-2	30	ug/l	< 0.067	U	**0.0766**	J	< 0.200	U	**0.107**	J	< 0.067	U	< 0.067	U	< 0.200	U	< 0.067	U	< 0.067	U	< 0.067	U
Sum U-235/U-238		30	ug/l			**0.0766**				**0.107**													
U-235/U-238 Ratio			ug/l																				
Vanadium	7440-62-2		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U
Zinc	7440-66-6		ug/l	< 3.30	U	< 3.30	U	< 3.30	U	< 3.30	U	**427**		**429**		**476**		**466**		< 3.30	U	< 3.30	U

Notes:

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 high.
U The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
UJ The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup) Duplicate sample.
ug/l Micrograms per liter
Limit Based on EPA MCL in Overburden and Bedrock except for Thorium (ILCR value), Cobolt (HI value), Copper (Overburden Action Level). Barium MCL is Bedrock only. Shaded cells exceed limit and apply to total metal concentrations only.
Bold Analyte detected above the laboratory reporting limit (detect).
T Total metal concentration
D Dissolved metal concentration.
U-235/U-238 Ratio The ratio of uranium isotopes used to identify the uranium isotopic signature. Ratios grater than 0.6 percent (%) indicate natural uranium, while ratios closer to 0.2% indicate depleted uranium.

Table 2-4. Semivolatile Organic Compounds - Sitewide Groundwater Sampling Results November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	ASSABET-1A		ASSABET-1A (dup		ASSABET-2A		GZW-10-2		GZW-11-2		GZW-7-2		GZW-8-2		ML-1-3		ML-3-3		MW-BM03		MW-BM15	
			Sample Date	11/18/2019		11/18/2019		11/18/2019		11/15/2019		11/14/2019		11/18/2019		11/19/2019		11/15/2019		11/19/2019		11/15/2019		11/19/2019	
			Formation							Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	**Cas No.**	**Limit**	**Unit**																						
1,2,4-Trichlorobenzene	120-82-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
1,2-Dichlorobenzene	95-50-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,3-Dichlorobenzene	541-73-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dichlorobenzene	106-46-7		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dioxane	123-91-1	**0.46**	µg/L	**0.204**		**0.194**		< 0.144	U	**55.4**		**0.132**	J	**34.7**		< 0.139	U	**13**		**1.68**		**16.5**		**0.806**	
2,4,5-Trichlorophenol	95-95-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4,6-Trichlorophenol	88-06-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dichlorophenol	120-83-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dimethylphenol	105-67-9		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dinitrophenol	51-28-5		µg/L	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	*NA*		< 20	UJ	< 20	UJ	< 20	UJ
2,4-Dinitrotoluene	121-14-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,6-Dinitrotoluene	606-20-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Chloronaphthalene	91-58-7		µg/L	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	U	*NA*		< 0.20	U	< 0.20	U	< 0.20	U
2-Chlorophenol	95-57-8		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
2-Methylnaphthalene	91-57-6		µg/L	**0.04**	J-	**0.03**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.03**	J	< 0.10	U	*NA*		< 0.10	U	< 0.10	U	< 0.10	U
2-Methylphenol	95-48-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Nitrophenol	88-75-5		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	*NA*		< 10	UJ	< 10	UJ	< 10	UJ
3-&4-Methylphenol	15831-10-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
3,3'-Dichlorobenzidine	91-94-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Bromophenyl phenyl ether	101-55-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
4-Chloroaniline	106-47-8		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Nitrophenol	100-02-7		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	*NA*		< 10	UJ	< 10	UJ	< 10	UJ
Acenaphthene	83-32-9		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	U	< 0.10	U
Acenaphthylene	208-96-8		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	U	< 0.10	U
Acetophenone	98-86-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Aniline	62-53-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Anthracene	120-12-7		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
Azobenzene	103-33-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Benzo[a]anthracene	56-55-3		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
Benzo[a]pyrene	50-32-8		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
Benzo[b]fluoranthene	205-99-2		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
Benzo[g,h,i]perylene	191-24-2		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
Benzo[k]fluoranthene	207-08-9		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
bis(2-Chloroethoxy)methane	111-91-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
bis(2-chloroethyl)ether	111-44-4		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-chloroisopropyl)ether	108-60-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-Ethylhexyl)phthalate	117-81-7	**6**	µg/L	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	*NA*		< 3.0	UJ	**2.1**	J-	< 3.0	UJ
Butyl benzyl phthalate	85-68-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Chrysene	218-01-9		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
Dibenz[a,h]anthracene	53-70-3		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
Dibenzofuran	132-64-9		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Diethyl phthalate	84-66-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Dimethyl phthalate	131-11-3		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-butyl phthalate	84-74-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-octyl phthalate	117-84-0		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Fluoranthene	206-44-0		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
Fluorene	86-73-7		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	**0.02**	J	< 0.10	U
Hexachlorobenzene	118-74-1		µg/L	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	*NA*		< 0.80	U	< 0.80	UJ	< 0.80	U
Hexachlorobutadiene	87-68-3		µg/L	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	*NA*		< 0.50	UJ	< 0.50	U	< 0.50	UJ
Hexachloroethane	67-72-1		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	*NA*		< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Indeno[1,2,3-cd]pyrene	193-39-5		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
Isophorone	78-59-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Naphthalene	91-20-3		µg/L	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	*NA*		**0.08**	J-	< 0.10	U	< 0.10	UJ
Nitrobenzene	98-95-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	*NA*		< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Pentachlorophenol	87-86-5		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	*NA*		< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Phenanthrene	85-01-8		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U
Phenol	108-95-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	*NA*		< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Pyrene	129-00-0		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.02**	J	*NA*		< 0.10	U	< 0.10	UJ	< 0.10	U

Table 2-4. Semivolatile Organic Compounds - Sitewide Groundwater Sampling Results November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-BS01		MW-BS02		MW-BS03		MW-BS04		MW-BS10		MW-BS12		MW-BS13		MW-BS14		MW-BS15		MW-BS17		MW-BS21		MW-BS22		MW-BS25		MW-BS25 (dup)		MW-BS26		MW-BS28		MW-BS31		MW-BS32		MW-BS34	
			Sample Date	11/12/2019		11/12/2019		11/15/2019		11/13/2019		11/14/2019		11/15/2019		11/13/2019		11/13/2019		11/18/2019		11/11/2019		11/15/2019		11/13/2019		11/15/2019		11/15/2019		11/19/2019		11/15/2019		11/15/2019		11/12/2019		11/15/2019	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	**Cas No.**	**Limit**	**Unit**																																						
1,2,4-Trichlorobenzene	120-82-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
1,2-Dichlorobenzene	95-50-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,3-Dichlorobenzene	541-73-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dichlorobenzene	106-46-7		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dioxane	123-91-1	**0.46**	µg/L	**29.3**		**6**		**11**		**0.0921**	J	**0.309**		< 0.139	U	**99.1**		**7.31**		**73.4**		**1**		< 0.144	U	< 0.150	U	**15.6**		**15.5**		< 0.139	U	**31**		**2.7**		**36.4**		**0.598**	
2,4,5-Trichlorophenol	95-95-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4,6-Trichlorophenol	88-06-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dichlorophenol	120-83-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dimethylphenol	105-67-9		µg/L		R		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dinitrophenol	51-28-5		µg/L		R		R	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ
2,4-Dinitrotoluene	121-14-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,6-Dinitrotoluene	606-20-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Chloronaphthalene	91-58-7		µg/L	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	UJ	< 0.20	UJ	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U
2-Chlorophenol	95-57-8		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
2-Methylnaphthalene	91-57-6		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	**0.03**	J	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	U
2-Methylphenol	95-48-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Nitrophenol	88-75-5		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
3-&4-Methylphenol	15831-10-4		µg/L	< 5.0	UJ	**3.6**	J-	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	**2.8**	J-	**3**	J-	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
3,3'-Dichlorobenzidine	91-94-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Bromophenyl phenyl ether	101-55-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
4-Chloroaniline	106-47-8		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Nitrophenol	100-02-7		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
Acenaphthene	83-32-9		µg/L	< 0.10	U	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Acenaphthylene	208-96-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Acetophenone	98-86-2		µg/L	< 5.0	UJ	**1.1**	J-	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	**0.66**	J-	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Aniline	62-53-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R		R	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Anthracene	120-12-7		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Azobenzene	103-33-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Benzo[a]anthracene	56-55-3		µg/L	< 0.10	U	**0.03**	J-	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	U
Benzo[a]pyrene	50-32-8		µg/L	< 0.10	U	**0.02**	J-	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	U
Benzo[b]fluoranthene	205-99-2		µg/L	< 0.10	U	**0.03**	J-	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.01**	J	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	U
Benzo[g,h,i]perylene	191-24-2		µg/L	< 0.10	U	**0.02**	J-	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Benzo[k]fluoranthene	207-08-9		µg/L	< 0.10	U	**0.02**	J-	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
bis(2-Chloroethoxy)methane	111-91-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
bis(2-chloroethyl)ether	111-44-4		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-chloroisopropyl)ether	108-60-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-Ethylhexyl)phthalate	117-81-7	**6**	µg/L	< 3.0	UJ	**2.5**	J-	< 3.0	UJ	< 3.0	UJ	< 3.0	U	**3.9**	J-	**3.1**	J-	**2.7**	J-	< 3.0	UJ	< 3.0	U	**2.4**	J-	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	**1.9**	J-	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ
Butyl benzyl phthalate	85-68-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Chrysene	218-01-9		µg/L	< 0.10	U	**0.01**	J-	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Dibenz[a,h]anthracene	53-70-3		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Dibenzofuran	132-64-9		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Diethyl phthalate	84-66-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Dimethyl phthalate	131-11-3		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-butyl phthalate	84-74-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-octyl phthalate	117-84-0		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Fluoranthene	206-44-0		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	U
Fluorene	86-73-7		µg/L	< 0.10	U	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Hexachlorobenzene	118-74-1		µg/L	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U
Hexachlorobutadiene	87-68-3		µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Hexachloroethane	67-72-1		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Indeno[1,2,3-cd]pyrene	193-39-5		µg/L	< 0.10	U	**0.02**	J-	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.01**	J	< 0.10	U
Isophorone	78-59-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Naphthalene	91-20-3		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	**0.12**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.05**	J	< 0.10	UJ	< 0.10	U	**0.14**		< 0.10	UJ	< 0.10	U	< 0.10	U	**0.06**	J	< 0.10	U
Nitrobenzene	98-95-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Pentachlorophenol	87-86-5		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Phenanthrene	85-01-8		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.04**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	U
Phenol	108-95-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	**0.93**	J-	**1.1**	J-	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Pyrene	129-00-0		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	U

Table 2-4. Semivolatile Organic Compounds - Sitewide Groundwater Sampling Results November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

Analyte	Cas No.	Limit	Unit	MW-BS35 11/12/2019 Bedrock		MW-BS36 11/15/2019 Bedrock		MW-BS37 11/15/2019 Bedrock		MW-BS38 11/12/2019 Bedrock		MW-BS39 11/13/2019 Bedrock		MW-BS40 11/11/2019 Bedrock		MW-BS46 11/18/2019 Bedrock		SW-2A 11/14/2019 Bedrock		EW-1 11/18/2019 Overburden		GZW-7-1 11/14/2019 Overburden		GZW-7S 11/13/2019 Overburden		GZW-8-1 11/11/2019 Overburden		GZW-9-1 11/12/2019 Overburden		GZW-9-2 11/14/2019 Overburden		HA-09 11/13/2019 Overburden		HA-11 11/13/2019 Overburden		HB-10 11/13/2019 Overburden		HB-10S 11/12/2019 Overburden		HB-11 11/12/2019 Overburden	
1,2,4-Trichlorobenzene	120-82-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
1,2-Dichlorobenzene	95-50-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,3-Dichlorobenzene	541-73-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dichlorobenzene	106-46-7		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dioxane	123-91-1	**0.46**	µg/L	< 0.139	U	< 0.139	U	**0.142**	J	< 0.144	U	< 0.139	U	< 0.144	U	< 0.139	U	< 0.144	U	**3.92**		**0.141**	J	**0.0933**	J	**0.632**		< 0.144	U	< 0.150	U	< 0.170	U	< 0.144	U	**0.436**		**1.04**		**0.877**	
2,4,5-Trichlorophenol	95-95-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4,6-Trichlorophenol	88-06-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dichlorophenol	120-83-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dimethylphenol	105-67-9		µg/L		R	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R
2,4-Dinitrophenol	51-28-5		µg/L		R	< 20	UJ	< 20	UJ		R	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ		R	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ		R
2,4-Dinitrotoluene	121-14-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,6-Dinitrotoluene	606-20-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Chloronaphthalene	91-58-7		µg/L	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	U
2-Chlorophenol	95-57-8		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
2-Methylnaphthalene	91-57-6		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.04**	J	< 0.10	UJ	**0.14**		< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.03**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	**0.05**	J+	< 0.10	U
2-Methylphenol	95-48-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Nitrophenol	88-75-5		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
3-&4-Methylphenol	15831-10-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
3,3'-Dichlorobenzidine	91-94-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ		R	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Bromophenyl phenyl ether	101-55-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
4-Chloroaniline	106-47-8		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Nitrophenol	100-02-7		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
Acenaphthene	83-32-9		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
Acenaphthylene	208-96-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
Acetophenone	98-86-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Aniline	62-53-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ		R	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Anthracene	120-12-7		µg/L	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
Azobenzene	103-33-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Benzo[a]anthracene	56-55-3		µg/L	**0.03**	J-	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
Benzo[a]pyrene	50-32-8		µg/L	**0.02**	J-	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Benzo[b]fluoranthene	205-99-2		µg/L	**0.03**	J-	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Benzo[g,h,i]perylene	191-24-2		µg/L	**0.01**	J-	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.01**	J+	**0.02**	J+	< 0.10	U	< 0.10	U	< 0.10	U
Benzo[k]fluoranthene	207-08-9		µg/L	**0.01**	J-	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
bis(2-Chloroethoxy)methane	111-91-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
bis(2-chloroethyl)ether	111-44-4		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-chloroisopropyl)ether	108-60-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-Ethylhexyl)phthalate	117-81-7	**6**	µg/L	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	**1.9**	J-	< 3.0	UJ	< 3.0	U	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ
Butyl benzyl phthalate	85-68-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Chrysene	218-01-9		µg/L	**0.02**	J-	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
Dibenz[a,h]anthracene	53-70-3		µg/L	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U
Dibenzofuran	132-64-9		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Diethyl phthalate	84-66-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Dimethyl phthalate	131-11-3		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-butyl phthalate	84-74-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-octyl phthalate	117-84-0		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Fluoranthene	206-44-0		µg/L	**0.02**	J-	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
Fluorene	86-73-7		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	UJ	**0.02**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
Hexachlorobenzene	118-74-1		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U
Hexachlorobutadiene	87-68-3		µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	U
Hexachloroethane	67-72-1		µg/L	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	UJ
Indeno[1,2,3-cd]pyrene	193-39-5		µg/L	**0.01**	J-	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U
Isophorone	78-59-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Naphthalene	91-20-3		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.08**	J	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.12**		< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	**0.05**	J	**0.41**	J+	< 0.10	U
Nitrobenzene	98-95-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Pentachlorophenol	87-86-5		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Phenanthrene	85-01-8		µg/L	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	**0.02**	J	< 0.10	UJ	**0.03**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
Phenol	108-95-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Pyrene	129-00-0		µg/L	**0.02**	J-	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U

de maximis, inc.
ddms

Table 2-4. Semivolatile Organic Compounds - Sitewide Groundwater Sampling Results November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	HB-12		HB-620		HB-620 (dup)		HBPZ-2R		ML-1-1		ML-1-2		ML-3-1		MW-1	
			Sample Date	11/11/2019		11/11/2019		11/11/2019		11/11/2019		11/13/2019		11/18/2019		11/19/2019		11/14/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**Limit**	**Unit**																
1,2,4-Trichlorobenzene	120-82-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
1,2-Dichlorobenzene	95-50-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,3-Dichlorobenzene	541-73-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dichlorobenzene	106-46-7		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dioxane	123-91-1	**0.46**	µg/L	**0.0721**	J	< 0.139	U	< 0.144	U	**0.0812**	J	**0.239**		**0.406**		< 0.178	U	**9.28**	
2,4,5-Trichlorophenol	95-95-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4,6-Trichlorophenol	88-06-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dichlorophenol	120-83-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dimethylphenol	105-67-9		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dinitrophenol	51-28-5		µg/L	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ
2,4-Dinitrotoluene	121-14-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,6-Dinitrotoluene	606-20-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Chloronaphthalene	91-58-7		µg/L	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	UJ
2-Chlorophenol	95-57-8		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
2-Methylnaphthalene	91-57-6		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.04**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
2-Methylphenol	95-48-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Nitrophenol	88-75-5		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
3-&4-Methylphenol	15831-10-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
3,3'-Dichlorobenzidine	91-94-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Bromophenyl phenyl ether	101-55-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
4-Chloroaniline	106-47-8		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Nitrophenol	100-02-7		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
Acenaphthene	83-32-9		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Acenaphthylene	208-96-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Acetophenone	98-86-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Aniline	62-53-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Anthracene	120-12-7		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.01**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Azobenzene	103-33-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Benzo[a]anthracene	56-55-3		µg/L	**0.02**	J	< 0.10	U	< 0.10	U	**0.13**		< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[a]pyrene	50-32-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.15**		< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[b]fluoranthene	205-99-2		µg/L	**0.02**	J	< 0.10	UJ	< 0.10	UJ	**0.24**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[g,h,i]perylene	191-24-2		µg/L	**0.02**	J+	< 0.10	U	< 0.10	U	**0.15**	J+	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[k]fluoranthene	207-08-9		µg/L	**0.01**	J	< 0.10	UJ	< 0.10	UJ	**0.09**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
bis(2-Chloroethoxy)methane	111-91-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
bis(2-chloroethyl)ether	111-44-4		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-chloroisopropyl)ether	108-60-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-Ethylhexyl)phthalate	117-81-7	**6**	µg/L	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	**2**	J-	< 3.0	UJ	< 3.0	UJ
Butyl benzyl phthalate	85-68-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Chrysene	218-01-9		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.16**		< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Dibenz[a,h]anthracene	53-70-3		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.04**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Dibenzofuran	132-64-9		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Diethyl phthalate	84-66-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Dimethyl phthalate	131-11-3		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-butyl phthalate	84-74-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-octyl phthalate	117-84-0		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Fluoranthene	206-44-0		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.2**		< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Fluorene	86-73-7		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Hexachlorobenzene	118-74-1		µg/L	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ
Hexachlorobutadiene	87-68-3		µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	UJ
Hexachloroethane	67-72-1		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	UJ
Indeno[1,2,3-cd]pyrene	193-39-5		µg/L	**0.02**	J	< 0.10	U	< 0.10	U	**0.15**		< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Isophorone	78-59-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Naphthalene	91-20-3		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.43**		< 0.10	U	< 0.10	U	**0.09**	J-	**0.1**	J
Nitrobenzene	98-95-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Pentachlorophenol	87-86-5		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Phenanthrene	85-01-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.04**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Phenol	108-95-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Pyrene	129-00-0		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.16**		< 0.10	U	**0.03**	J	< 0.10	U	< 0.10	UJ

Sample Location	MW-1 (dup)		MW-2		MW-8A		MW-S01		MW-S02		MW-S02 (dup)		MW-S03		MW-S04		MW-S06		MW-S07		MW-S08	
Sample Date	11/14/2019		11/11/2019		11/13/2019		11/15/2019		11/14/2019		11/14/2019		11/12/2019		11/13/2019		11/14/2019		11/11/2019		11/13/2019	
Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte																						
1,2,4-Trichlorobenzene	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
1,2-Dichlorobenzene	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,3-Dichlorobenzene	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dichlorobenzene	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dioxane	**9.29**		**0.0963**	J	< 0.139	U	**9.08**		**4.44**		**5**		< 0.144	U	< 0.139	U	**0.247**		**0.164**		< 0.150	U
2,4,5-Trichlorophenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4,6-Trichlorophenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dichlorophenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dimethylphenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dinitrophenol	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ
2,4-Dinitrotoluene	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,6-Dinitrotoluene	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Chloronaphthalene	< 0.20	UJ	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	UJ
2-Chlorophenol	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
2-Methylnaphthalene	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.03**	J+	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.03**	J-
2-Methylphenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Nitrophenol	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
3-&4-Methylphenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
3,3'-Dichlorobenzidine	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ
4-Bromophenyl phenyl ether	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
4-Chloroaniline	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Nitrophenol	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
Acenaphthene	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ
Acenaphthylene	< 0.10	UJ	**0.02**	J	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ
Acetophenone	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Aniline	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ	< 2.0	UJ		R
Anthracene	< 0.10	UJ	**0.02**	J	**0.01**	J	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J+	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ
Azobenzene	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Benzo[a]anthracene	< 0.10	UJ	**0.02**	J	**0.07**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.02**	J+	**0.02**	J	< 0.10	UJ	< 0.10	U	< 0.10	UJ
Benzo[a]pyrene	< 0.10	UJ	**0.02**	J	**0.09**	J+	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.03**	J+	< 0.10	UJ	< 0.10	U	< 0.10	U
Benzo[b]fluoranthene	< 0.10	UJ	**0.02**	J	**0.13**	J+	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.05**	J+	< 0.10	UJ	< 0.10	UJ	< 0.10	U
Benzo[g,h,i]perylene	< 0.10	UJ	**0.02**	J+	**0.09**	J+	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.04**	J+	< 0.10	UJ	< 0.10	U	< 0.10	U
Benzo[k]fluoranthene	< 0.10	UJ	**0.01**	J	**0.04**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.02**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
bis(2-Chloroethoxy)methane	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
bis(2-chloroethyl)ether	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-chloroisopropyl)ether	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-Ethylhexyl)phthalate	< 3.0	UJ	< 3.0	UJ	**2**	J-	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	U	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ
Butyl benzyl phthalate	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Chrysene	< 0.10	UJ	< 0.10	U	**0.09**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.02**	J+	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ
Dibenz[a,h]anthracene	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ
Dibenzofuran	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Diethyl phthalate	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Dimethyl phthalate	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-butyl phthalate	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-octyl phthalate	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Fluoranthene	< 0.10	UJ	**0.04**	J	**0.13**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.02**	J	< 0.10	UJ	< 0.10	U	< 0.10	UJ
Fluorene	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	**0.04**	J+	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ
Hexachlorobenzene	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	UJ
Hexachlorobutadiene	< 0.50	UJ	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	U	< 0.50	UJ
Hexachloroethane	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Indeno[1,2,3-cd]pyrene	< 0.10	UJ	**0.02**	J	**0.08**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.04**	J	< 0.10	UJ	< 0.10	U	< 0.10	UJ
Isophorone	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Naphthalene	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.14**	J+	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.17**	J
Nitrobenzene	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Pentachlorophenol	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Phenanthrene	< 0.10	J-	**0.04**	J	**0.1**	J	< 0.10	U	< 0.10	J-	< 0.10	U	**0.12**	J+	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ
Phenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Pyrene	< 0.10	UJ	**0.03**	J	**0.13**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ

Table 2-4. Semivolatile Organic Compounds - Sitewide Groundwater Sampling Results November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S09		MW-S09 (dup)		MW-S11		MW-S12		MW-S12 (dup)		MW-S14		MW-S15		MW-S16		MW-S16 (dup)		MW-S17		MW-S18		MW-S19		MW-S20		MW-S21		MW-S22		MW-S23		MW-S24		MW-S26		MW-S27	
			Sample Date	11/12/2019		11/12/2019		11/13/2019		11/14/2019		11/14/2019		11/12/2019		11/15/2019		11/12/2019		11/12/2019		11/12/2019		11/11/2019		11/11/2019		11/12/2019		11/14/2019		11/13/2019		11/13/2019		11/13/2019		11/15/2019		11/13/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	Cas No.	Limit	Unit																																						
1,2,4-Trichlorobenzene	120-82-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
1,2-Dichlorobenzene	95-50-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,3-Dichlorobenzene	541-73-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dichlorobenzene	106-46-7		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dioxane	123-91-1	**0.46**	µg/L	< 0.150	U	< 0.144	U	< 0.139	U	< 0.139	U	< 0.139	U	< 0.150	U	< 0.139	U	**0.135**	J	**0.146**	J	**0.216**		< 0.144	U	< 0.144	U	**0.356**		< 0.150	U	< 0.144	U	< 0.150	U	**0.135**	J	< 0.144	UJ	**0.118**	J
2,4,5-Trichlorophenol	95-95-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4,6-Trichlorophenol	88-06-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dichlorophenol	120-83-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dimethylphenol	105-67-9		µg/L		R		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dinitrophenol	51-28-5		µg/L		R		R	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ		R	< 20	UJ	< 20	UJ		R	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ
2,4-Dinitrotoluene	121-14-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,6-Dinitrotoluene	606-20-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Chloronaphthalene	91-58-7		µg/L	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	UJ	< 0.20	UJ	< 0.20	U	< 0.20	UJ	< 0.20	U
2-Chlorophenol	95-57-8		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
2-Methylnaphthalene	91-57-6		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U
2-Methylphenol	95-48-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Nitrophenol	88-75-5		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
3-&4-Methylphenol	15831-10-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
3,3'-Dichlorobenzidine	91-94-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Bromophenyl phenyl ether	101-55-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
4-Chloroaniline	106-47-8		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Nitrophenol	100-02-7		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
Acenaphthene	83-32-9		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U
Acenaphthylene	208-96-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U
Acetophenone	98-86-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Aniline	62-53-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Anthracene	120-12-7		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	**0.02**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	UJ	< 0.10	UJ	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U
Azobenzene	103-33-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Benzo[a]anthracene	56-55-3		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.07**	J	< 0.10	U	**0.18**	J	**0.02**	J-	< 0.10	U	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	UJ	< 0.10	UJ	**0.03**	J	< 0.10	U	< 0.10	U	< 0.10	U
Benzo[a]pyrene	50-32-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.05**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	**0.02**	J+	< 0.10	U	< 0.10	U	< 0.10	U
Benzo[b]fluoranthene	205-99-2		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.07**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.02**	J	< 0.10	UJ	< 0.10	U	**0.04**	J+	**0.02**	J	< 0.10	U	< 0.10	U
Benzo[g,h,i]perylene	191-24-2		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.03**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	**0.03**	J+	**0.01**	J+	< 0.10	U	< 0.10	U
Benzo[k]fluoranthene	207-08-9		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.04**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.01**	J	< 0.10	UJ	< 0.10	UJ	**0.01**	J	< 0.10	U	< 0.10	U	< 0.10	U
bis(2-Chloroethoxy)methane	111-91-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
bis(2-chloroethyl)ether	111-44-4		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-chloroisopropyl)ether	108-60-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-Ethylhexyl)phthalate	117-81-7	**6**	µg/L	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	**2.4**	J-	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ
Butyl benzyl phthalate	85-68-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Chrysene	218-01-9		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.04**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	**0.01**	J	< 0.10	UJ	< 0.10	UJ	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U
Dibenz[a,h]anthracene	53-70-3		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.02**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
Dibenzofuran	132-64-9		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Diethyl phthalate	84-66-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Dimethyl phthalate	131-11-3		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-butyl phthalate	84-74-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-octyl phthalate	117-84-0		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Fluoranthene	206-44-0		µg/L	**0.02**	J+	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.04**	J	< 0.10	U	**0.04**	J	**0.01**	J-	< 0.10	U	< 0.10	U	< 0.10	U	**0.04**	J	< 0.10	UJ	< 0.10	UJ	**0.02**	J	**0.02**	J	< 0.10	U	< 0.10	U
Fluorene	86-73-7		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	**0.02**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U
Hexachlorobenzene	118-74-1		µg/L	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U
Hexachlorobutadiene	87-68-3		µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	U	< 0.50	UJ	< 0.50	U
Hexachloroethane	67-72-1		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	UJ
Indeno[1,2,3-cd]pyrene	193-39-5		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.04**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.03**	J	< 0.10	U	< 0.10	U	< 0.10	U
Isophorone	78-59-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Naphthalene	91-20-3		µg/L	< 0.10	U	< 0.10	U	**0.08**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U
Nitrobenzene	98-95-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Pentachlorophenol	87-86-5		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Phenanthrene	85-01-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	J-	< 0.10	U	**0.04**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	**0.05**	J	< 0.10	UJ	< 0.10	UJ	**0.03**	J	< 0.10	U	< 0.10	U	< 0.10	U
Phenol	108-95-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Pyrene	129-00-0		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	**0.04**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	**0.02**	J	< 0.10	U	< 0.10	U

Table 2-4. Semivolatile Organic Compounds - Sitewide Groundwater Sampling Results November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-S28		MW-S29		MW-S30		MW-S32		MW-S35		MW-S36		MW-S37		MW-S38		MW-S39		MW-S40		MW-SD01		MW-SD02		MW-SD06		MW-SD10		MW-SD13		MW-SD17		MW-SD26		MW-SD27		MW-SD29	
			Sample Date	11/14/2019		11/13/2019		11/15/2019		11/13/2019		11/12/2019		11/11/2019		11/13/2019		11/13/2019		11/14/2019		11/14/2019		11/14/2019		11/12/2019		11/14/2019		11/12/2019		11/12/2019		11/12/2019		11/18/2019		11/12/2019		11/14/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**Limit**	**Unit**																																						
1,2,4-Trichlorobenzene	120-82-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
1,2-Dichlorobenzene	95-50-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,3-Dichlorobenzene	541-73-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dichlorobenzene	106-46-7		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dioxane	123-91-1	**0.46**	µg/L	< 0.139	U	< 0.144	U	**0.501**		**1.17**		< 0.150	U	**0.0736**	J	**0.311**		**0.161**		< 0.144	U	**0.248**		**3.34**		< 0.139	U	**3.08**		< 0.150	U	**0.612**		0.288		**1.8**		< 0.144	U	< 0.144	U
2,4,5-Trichlorophenol	95-95-4		µg/L	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ
2,4,6-Trichlorophenol	88-06-2		µg/L	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dichlorophenol	120-83-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dimethylphenol	105-67-9		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dinitrophenol	51-28-5		µg/L	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ		R	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ
2,4-Dinitrotoluene	121-14-2		µg/L	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,6-Dinitrotoluene	606-20-2		µg/L	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Chloronaphthalene	91-58-7		µg/L	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U
2-Chlorophenol	95-57-8		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ
2-Methylnaphthalene	91-57-6		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	**0.05**	J	< 0.10	U	< 0.10	UJ
2-Methylphenol	95-48-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ
2-Nitrophenol	88-75-5		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	U	< 10	UJ	< 10	UJ
3-&4-Methylphenol	15831-10-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
3,3'-Dichlorobenzidine	91-94-1		µg/L		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ		R		R		R	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R
4-Bromophenyl phenyl ether	101-55-3		µg/L	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
4-Chloroaniline	106-47-8		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Nitrophenol	100-02-7		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	U	< 10	UJ	< 10	UJ
Acenaphthene	83-32-9		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Acenaphthylene	208-96-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.04**	J	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Acetophenone	98-86-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Aniline	62-53-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ	< 2.0	UJ
Anthracene	120-12-7		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Azobenzene	103-33-3		µg/L	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Benzo[a]anthracene	56-55-3		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.04**	J	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	**0.12**		< 0.10	UJ	**0.03**	J	< 0.10	UJ	**0.03**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[a]pyrene	50-32-8		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.05**	J	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	**0.02**	J	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[b]fluoranthene	205-99-2		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.1**		< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.02**	J	< 0.10	UJ	**0.18**		< 0.10	UJ	**0.03**	J	< 0.10	UJ	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[g,h,i]perylene	191-24-2		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.08**	J+	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[k]fluoranthene	207-08-9		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
bis(2-Chloroethoxy)methane	111-91-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
bis(2-chloroethyl)ether	111-44-4		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-chloroisopropyl)ether	108-60-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-Ethylhexyl)phthalate	117-81-7	**6**	µg/L	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	**4.5**	J-	< 3.0	UJ	< 3.0	U	**2**	J-	**7.8**	J-	**4.7**		< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	**1.6**	J-	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ
Butyl benzyl phthalate	85-68-7		µg/L	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Chrysene	218-01-9		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	**0.11**		< 0.10	UJ	**0.01**	J	< 0.10	UJ	**0.01**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Dibenz[a,h]anthracene	53-70-3		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Dibenzofuran	132-64-9		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Diethyl phthalate	84-66-2		µg/L	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Dimethyl phthalate	131-11-3		µg/L	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-butyl phthalate	84-74-2		µg/L	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-octyl phthalate	117-84-0		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Fluoranthene	206-44-0		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	**0.04**	J	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Fluorene	86-73-7		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	UJ	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Hexachlorobenzene	118-74-1		µg/L	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U
Hexachlorobutadiene	87-68-3		µg/L	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	UJ
Hexachloroethane	67-72-1		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	UJ
Indeno[1,2,3-cd]pyrene	193-39-5		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.07**	J	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Isophorone	78-59-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Naphthalene	91-20-3		µg/L	< 0.10	UJ	**0.06**	J	**0.12**		< 0.10	U	< 0.10	U	**0.3**		**0.12**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.08**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Nitrobenzene	98-95-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Pentachlorophenol	87-86-5		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Phenanthrene	85-01-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.05**	J	< 0.10	UJ	**0.07**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Phenol	108-95-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Pyrene	129-00-0		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	**0.03**	J	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ

Table 2-4. Semivolatile Organic Compounds - Sitewide Groundwater Sampling Results November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location Sample Date Formation	MW-SD30 11/12/2019 Overburden		MW-SD32 11/15/2019 Overburden		MW-SD34 11/14/2019 Overburden		MW-SD35 11/13/2019 Overburden		MW-SD36 11/18/2019 Overburden		MW-SD36 (dup) 11/18/2019 Overburden		MW-SD37 11/18/2019 Overburden		MW-SD38 11/15/2019 Overburden	
Analyte	**Cas No.**	**Limit**	**Unit**																
1,2,4-Trichlorobenzene	120-82-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
1,2-Dichlorobenzene	95-50-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,3-Dichlorobenzene	541-73-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dichlorobenzene	106-46-7		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dioxane	123-91-1	**0.46**	µg/L	< 0.139	U	**0.487**		**27.3**		**0.0996**	J	< 0.139	U	< 0.139	U	**3.04**		**1.37**	
2,4,5-Trichlorophenol	95-95-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ
2,4,6-Trichlorophenol	88-06-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dichlorophenol	120-83-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ
2,4-Dimethylphenol	105-67-9		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dinitrophenol	51-28-5		µg/L	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	U	< 20	U	< 20	UJ	< 20	UJ
2,4-Dinitrotoluene	121-14-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,6-Dinitrotoluene	606-20-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Chloronaphthalene	91-58-7		µg/L	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	UJ	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U
2-Chlorophenol	95-57-8		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ
2-Methylnaphthalene	91-57-6		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
2-Methylphenol	95-48-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ
2-Nitrophenol	88-75-5		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	U	< 10	U	< 10	UJ	< 10	UJ
3-&4-Methylphenol	15831-10-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ
3,3'-Dichlorobenzidine	91-94-1		µg/L	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Bromophenyl phenyl ether	101-55-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
4-Chloroaniline	106-47-8		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Nitrophenol	100-02-7		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	U	< 10	U	< 10	UJ	< 10	UJ
Acenaphthene	83-32-9		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Acenaphthylene	208-96-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Acetophenone	98-86-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Aniline	62-53-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R		R		R		R	< 2.0	UJ
Anthracene	120-12-7		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Azobenzene	103-33-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Benzo[a]anthracene	56-55-3		µg/L	**0.03**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[a]pyrene	50-32-8		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[b]fluoranthene	205-99-2		µg/L	**0.03**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[g,h,i]perylene	191-24-2		µg/L	**0.02**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[k]fluoranthene	207-08-9		µg/L	**0.01**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
bis(2-Chloroethoxy)methane	111-91-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
bis(2-chloroethyl)ether	111-44-4		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-chloroisopropyl)ether	108-60-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-Ethylhexyl)phthalate	117-81-7	**6**	µg/L	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ
Butyl benzyl phthalate	85-68-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Chrysene	218-01-9		µg/L	**0.01**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Dibenz[a,h]anthracene	53-70-3		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Dibenzofuran	132-64-9		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Diethyl phthalate	84-66-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Dimethyl phthalate	131-11-3		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-butyl phthalate	84-74-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-octyl phthalate	117-84-0		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Fluoranthene	206-44-0		µg/L	**0.02**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Fluorene	86-73-7		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Hexachlorobenzene	118-74-1		µg/L	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ
Hexachlorobutadiene	87-68-3		µg/L	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Hexachloroethane	67-72-1		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ
Indeno[1,2,3-cd]pyrene	193-39-5		µg/L	**0.02**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Isophorone	78-59-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Naphthalene	91-20-3		µg/L	< 0.10	U	**0.05**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Nitrobenzene	98-95-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Pentachlorophenol	87-86-5		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ		R	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Phenanthrene	85-01-8		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Phenol	108-95-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Pyrene	129-00-0		µg/L	**0.02**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ

Sample Location Sample Date Formation	MW-SD39 11/15/2019 Overburden		MW-SD40 11/14/2019 Overburden		MW-SD40 (dup) 11/14/2019 Overburden		MW-SD41 11/15/2019 Overburden		MW-SD41 (dup) 11/15/2019 Overburden		MW-SD42A 11/15/2019 Overburden		MW-SD43 11/15/2019 Overburden		MW-SD44 11/15/2019 Overburden		MW-SD45 11/14/2019 Overburden		MW-SD46 11/18/2019 Overburden		MW-SD46 (dup) 11/18/2019 Overburden	
Analyte																						
1,2,4-Trichlorobenzene	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
1,2-Dichlorobenzene	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,3-Dichlorobenzene	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dichlorobenzene	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dioxane	< 0.144	U	**0.429**		**0.479**		**0.561**		**0.581**		**0.42**		< 0.139	U	**2.34**		**0.25**		**1.11**		**1.2**	
2,4,5-Trichlorophenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U
2,4,6-Trichlorophenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dichlorophenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dimethylphenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dinitrophenol	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ
2,4-Dinitrotoluene	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,6-Dinitrotoluene	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Chloronaphthalene	< 0.20	U	< 0.20	UJ	<20	UJ	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U
2-Chlorophenol	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
2-Methylnaphthalene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	0.04	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U
2-Methylphenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Nitrophenol	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
3-&4-Methylphenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
3,3'-Dichlorobenzidine	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ
4-Bromophenyl phenyl ether	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
4-Chloroaniline	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Nitrophenol	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
Acenaphthene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	0.04	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Acenaphthylene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	0.04	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Acetophenone	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Aniline	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R		R
Anthracene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	0.04	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ
Azobenzene	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Benzo[a]anthracene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Benzo[a]pyrene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Benzo[b]fluoranthene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Benzo[g,h,i]perylene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Benzo[k]fluoranthene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
bis(2-Chloroethoxy)methane	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
bis(2-chloroethyl)ether	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-chloroisopropyl)ether	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-Ethylhexyl)phthalate	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	**2.9**	J-	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ
Butyl benzyl phthalate	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Chrysene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Dibenz[a,h]anthracene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Dibenzofuran	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Diethyl phthalate	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Dimethyl phthalate	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-butyl phthalate	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-octyl phthalate	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Fluoranthene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Fluorene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	**0.04**	J	< 0.10	U	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U
Hexachlorobenzene	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	UJ
Hexachlorobutadiene	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	U
Hexachloroethane	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	U
Indeno[1,2,3-cd]pyrene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Isophorone	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Naphthalene	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.1**	B	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U
Nitrobenzene	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Pentachlorophenol	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Phenanthrene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ
Phenol	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Pyrene	< 0.10	U	< 0.10	UJ	<0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ

Table 2-4. Semivolatile Organic Compounds - Sitewide Groundwater Sampling Results November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

			Sample Location	MW-SM13		MW-SM46		MW-T10		MW-T24		OW-2		OW-3		P-1		P-1A		P-2		P-3		P-4		PT-09		PT-11P		PW-6		PW-6 (dup)		SW-1	
			Sample Date	11/11/2019		11/15/2019		11/14/2019		11/13/2019		11/11/2019		11/13/2019		11/18/2019		11/15/2019		11/15/2019		11/15/2019		11/13/2019		11/18/2019		11/13/2019		11/13/2019		11/13/2019		11/14/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**Limit**	**Unit**																																
1,2,4-Trichlorobenzene	120-82-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
1,2-Dichlorobenzene	95-50-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,3-Dichlorobenzene	541-73-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dichlorobenzene	106-46-7		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,4-Dioxane	123-91-1	**0.46**	µg/L	< 0.144	U	**2.38**		**1.17**		**29.1**		**0.478**		**1.55**		**2.08**		**0.244**		**0.145**		**0.215**		< 0.150	U	< 0.139		**0.121**	J	< 0.150	U	< 0.150	U	< 0.144	U
2,4,5-Trichlorophenol	95-95-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4,6-Trichlorophenol	88-06-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dichlorophenol	120-83-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dimethylphenol	105-67-9		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,4-Dinitrophenol	51-28-5		µg/L	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ	< 20	UJ
2,4-Dinitrotoluene	121-14-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2,6-Dinitrotoluene	606-20-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Chloronaphthalene	91-58-7		µg/L	< 0.20	U	< 0.20	UJ	< 0.20	UJ	< 0.20	UJ	< 0.20	U	**0.03**	J	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	U	< 0.20	UJ	< 0.20	U	< 0.20	UJ	< 0.20	UJ	< 0.20	UJ	< 0.20	U
2-Chlorophenol	95-57-8		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
2-Methylnaphthalene	91-57-6		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.03**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
2-Methylphenol	95-48-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
2-Nitrophenol	88-75-5		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
3-&4-Methylphenol	15831-10-4		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
3,3'-Dichlorobenzidine	91-94-1		µg/L	< 5.0	UJ	< 5.0	UJ		R	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Bromophenyl phenyl ether	101-55-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
4-Chloroaniline	106-47-8		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Nitrophenol	100-02-7		µg/L	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ	< 10	UJ
Acenaphthene	83-32-9		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U
Acenaphthylene	208-96-8		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U
Acetophenone	98-86-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Aniline	62-53-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R		R	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ		R	< 2.0	UJ		R		R		UJ	< 2.0	UJ
Anthracene	120-12-7		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.02**	J	< 0.10	U	< 0.10	U	**0.02**	J	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U
Azobenzene	103-33-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Benzo[a]anthracene	56-55-3		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.03**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Benzo[a]pyrene	50-32-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.02**	J+	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.02**	J-	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[b]fluoranthene	205-99-2		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	UJ	**0.16**	J+	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[g,h,i]perylene	191-24-2		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.08**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ
Benzo[k]fluoranthene	207-08-9		µg/L	< 0.10	UJ	< 0.10	U	< 0.10	UJ	**0.05**	J	< 0.10	UJ	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
bis(2-Chloroethoxy)methane	111-91-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
bis(2-chloroethyl)ether	111-44-4		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-chloroisopropyl)ether	108-60-1		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
bis(2-Ethylhexyl)phthalate	117-81-7	**6**	µg/L	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	**2.1**	J-	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ	< 3.0	UJ
Butyl benzyl phthalate	85-68-7		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Chrysene	218-01-9		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.12**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Dibenz[a,h]anthracene	53-70-3		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.02**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Dibenzofuran	132-64-9		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Diethyl phthalate	84-66-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Dimethyl phthalate	131-11-3		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-butyl phthalate	84-74-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Di-n-octyl phthalate	117-84-0		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Fluoranthene	206-44-0		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.12**	J	< 0.10	U	**0.02**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Fluorene	86-73-7		µg/L	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U	**0.03**	J	< 0.10	U	< 0.10	U	**0.03**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U
Hexachlorobenzene	118-74-1		µg/L	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U
Hexachlorobutadiene	87-68-3		µg/L	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	U	< 0.50	UJ	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ	< 0.50	UJ
Hexachloroethane	67-72-1		µg/L	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	U	< 0.80	U	< 0.80	UJ	< 0.80	U	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Indeno[1,2,3-cd]pyrene	193-39-5		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.07**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Isophorone	78-59-1		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Naphthalene	91-20-3		µg/L	**0.17**		< 0.10	U	< 0.10		< 0.10	UJ	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ
Nitrobenzene	98-95-3		µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
Pentachlorophenol	87-86-5		µg/L	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ		R	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	**0.27**	J	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ	< 0.80	UJ
Phenanthrene	85-01-8		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.06**	J	< 0.10	U	**0.03**	J	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	U
Phenol	108-95-2		µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
Pyrene	129-00-0		µg/L	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.09**	J	< 0.10	U	< 0.10	UJ	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	UJ	**0.03**	J-	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ	< 0.10	UJ

B: The analyte was detected above the reporting limit in the associated method blank
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.
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.
U: The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

Dup: Duplicate sample
µg/L: micrograms per liter
Bold: Analyte detected above the laboratory reporting limit (detect)
Limit: 1,4-dioxane limit based on ILCR, bis(2-ethylhexl)pthalate based on USEPA MCL. Both apply to bedrock and overburden.
N/A: not analyzed
Shade: Value exceeds Limit

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	ASSABET-1A		ASSABET-1A (dup)		ASSABET-2A		GZW-10-2		GZW-11-2		GZW-7-2		GZW-8-2		ML-3-3		MW-BM03		MW-BM15	
				Sample Date	11/18/2019		11/18/2019		11/18/2019		11/15/2019		11/14/2019		11/18/2019		11/19/2019		11/19/2019		11/15/2019		11/19/2019	
				Formation							Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																				
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,1-Trichloroethane	71-55-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2-Trichloroethane	79-00-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**4**		< 1.0	U	**0.39**	J	< 1.0	U	< 1.0	U	**0.94**	J	< 1.0	U
1,1-Dichloroethene	75-35-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**0.73**	J	< 1.0	U	**1**	J+	< 1.0	U	< 1.0	U	**0.56**	J	< 1.0	U
1,1-Dichloropropene	563-58-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichlorobenzene	87-61-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichloropropane	96-18-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trichlorobenzene	120-82-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trimethylbenzene	95-63-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	**1.8**	J	< 2.0	U	< 2.0	U
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromoethane	106-93-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dichlorobenzene	95-50-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethane	107-06-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethylene (total)	540-59-0			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**1.1**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.5**	J	< 1.0	U
1,2-Dichloropropane	78-87-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3,5-Trimethylbenzene	108-67-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	**0.33**	J	< 2.0	U	< 2.0	U
1,3-Dichlorobenzene	541-73-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3-Dichloropropane	142-28-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichloropropene, Total	542-75-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
1,4-Dichlorobenzene	106-46-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
2,2-Dichloropropane	594-20-7			µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ
2-Chlorotoluene	95-49-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Hexanone	591-78-6			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U
4-Chlorotoluene	106-43-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
4-Methyl-2-Pentanone	108-10-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Acetone	67-64-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Benzene	71-43-2			µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Bromobenzene	108-86-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromochloromethane	74-97-5			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromodichloromethane	75-27-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Bromoform	75-25-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromomethane	74-83-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	**0.7**	J	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon disulfide	75-15-0			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon tetrachloride	56-23-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chlorobenzene	108-90-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloroethane	75-00-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Chloroform	67-66-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloromethane	74-87-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
cis-1,2-Dichloroethene	156-59-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**1.1**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.5**	J	< 1.0	U
cis-1,3-Dichloropropene	10061-01-5			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Dibromochloromethane	124-48-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Dibromomethane	74-95-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Dichlorodifluoromethane	75-71-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethyl ether	60-29-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U

de maximis, inc.
ddms

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	ASSABET-1A		ASSABET-1A (dup)		ASSABET-2A		GZW-10-2		GZW-11-2		GZW-7-2		GZW-8-2		ML-3-3		MW-BM03		MW-BM15	
				Sample Date	11/18/2019		11/18/2019		11/18/2019		11/15/2019		11/14/2019		11/18/2019		11/19/2019		11/19/2019		11/15/2019		11/19/2019	
				Formation							Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																				
Ethyl tert-butyl ether	637-92-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethylbenzene	100-41-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Hexachlorobutadiene	87-68-3			µg/L	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U
Isopropyl Ether	108-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Isopropylbenzene	98-82-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
m-&p-Xylenes	179601-23-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Methyl tert-butyl ether	1634-04-4			µg/L	**0.17**	J	**0.17**	J	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methylene Chloride	75-09-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Naphthalene	91-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Butylbenzene	104-51-8			µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	**0.38**	J	< 2.0	U	< 2.0	U
N-Propylbenzene	103-65-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
o-Xylene	95-47-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
P-Isopropyltoluene	99-87-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Sec-Butylbenzene	135-98-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Styrene	100-42-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
tert-Amyl methyl ether	994-05-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tert-Butylbenzene	98-06-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tetrachloroethylene	127-18-4	5	5.76	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**0.26**	J	< 1.0	U	**1.3**		< 1.0	U	< 1.0	U	**0.61**	J	< 1.0	U
Tetrahydrofuran	109-99-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U
Toluene	108-88-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.27**	J	< 1.0	U	< 1.0	U
trans-1,2-Dichloroethene	156-60-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,3-Dichloropropene	10061-02-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Trichloroethene	79-01-6	5	0.518	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**1.6**		< 1.0	U	**2.7**		< 1.0	U	< 1.0	U	**1.7**		< 1.0	U
Trichlorofluoromethane	75-69-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Vinyl Chloride	75-01-4	2	0.147	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Xylenes (total)	1330-20-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

Notes:
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.
NJ: The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
U: Analyte not detected above the laboratory reporting limit
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup): duplicate sample
µg/L micrograms per liter
Bold: Analyte detected above the laboratory reporting limit (detect)
Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.
VISL: Vapor Intrusion Screening Level
Shade: value exceeds limit
value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location Sample Date Formation	MW-BS01 11/12/2019 Bedrock		MW-BS02 11/12/2019 Bedrock		MW-BS03 11/15/2019 Bedrock		MW-BS04 11/13/2019 Bedrock		MW-BS10 11/14/2019 Bedrock		MW-BS12 11/15/2019 Bedrock		MW-BS13 11/13/2019 Bedrock		MW-BS14 11/13/2019 Bedrock		MW-BS15 11/18/2019 Bedrock		MW-BS17 11/11/2019 Bedrock		MW- 11/15 Bed
Analyte	Cas No.	Limit	VISL	Unit																					
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,1-Trichloroethane	71-55-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,2-Trichloroethane	79-00-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	**9.3**	J	**0.28**	J	**0.62**	J	< 1.0	U	< 1.0	U	< 1.0	U	**6.8**		< 1.0	U	**2.2**		**0.26**	JN	< 1.0
1,1-Dichloroethene	75-35-4			µg/L	**1.6**		< 1.0	U	**0.41**	J	< 1.0	U	< 1.0	U	< 1.0	U	**1.3**		< 1.0	U	**1.4**	J+	< 1.0	U	< 1.0
1,1-Dichloropropene	563-58-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,3-Trichlorobenzene	87-61-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0
1,2,3-Trichloropropane	96-18-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,4-Trichlorobenzene	120-82-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,4-Trimethylbenzene	95-63-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dibromoethane	106-93-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dichlorobenzene	95-50-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloroethane	107-06-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloroethylene (total)	540-59-0			µg/L	**1.1**		< 1.0	U	**0.72**	J	**2.1**		**1**		< 1.0	U	**1.5**		**0.41**	J	**0.63**	J	**0.3**	J	< 1.0
1,2-Dichloropropane	78-87-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,3,5-Trimethylbenzene	108-67-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,3-Dichlorobenzene	541-73-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,3-Dichloropropane	142-28-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,3-Dichloropropene, Total	542-75-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
1,4-Dichlorobenzene	106-46-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
2,2-Dichloropropane	594-20-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
2-Chlorotoluene	95-49-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
2-Hexanone	591-78-6			µg/L	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	**1.2**	J	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0
4-Chlorotoluene	106-43-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
4-Methyl-2-Pentanone	108-10-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	**0.54**	J	< 5.0	U	< 5.0	U	< 5.0
Acetone	67-64-1			µg/L	< 5.0	U	**8.9**	J	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	**7.9**	J-	< 5.0	U	< 5.0	U	< 5.0
Benzene	71-43-2			µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50
Bromobenzene	108-86-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromochloromethane	74-97-5			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromodichloromethane	75-27-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Bromoform	75-25-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromomethane	74-83-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Carbon disulfide	75-15-0			µg/L	< 2.0	U	**2**		< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	**2**		< 2.0	U	< 2.0	U	< 2.0
Carbon tetrachloride	56-23-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chlorobenzene	108-90-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chloroethane	75-00-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Chloroform	67-66-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chloromethane	74-87-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
cis-1,2-Dichloroethene	156-59-2			µg/L	**1.1**		< 1.0	U	**0.72**	J	**2.1**		**1**		< 1.0	U	**1.5**		**0.41**	J	**0.63**	J	**0.3**	J	< 1.0
cis-1,3-Dichloropropene	10061-01-5			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
Dibromochloromethane	124-48-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Dibromomethane	74-95-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Dichlorodifluoromethane	75-71-8			µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
Ethyl ether	60-29-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0

de maximis, inc.
ddms

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	**MW-BS01**		**MW-BS02**		**MW-BS03**		**MW-BS04**		**MW-BS10**		**MW-BS12**		**MW-BS13**		**MW-BS14**		**MW-BS15**		**MW-BS17**		**MW-**
				Sample Date	**11/12/2019**		**11/12/2019**		**11/15/2019**		**11/13/2019**		**11/14/2019**		**11/15/2019**		**11/13/2019**		**11/13/2019**		**11/18/2019**		**11/11/2019**		**11/15**
				Formation	**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bed**
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
Ethyl tert-butyl ether	637-92-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Ethylbenzene	100-41-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Hexachlorobutadiene	87-68-3			µg/L	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60
Isopropyl Ether	108-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Isopropylbenzene	98-82-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
m-&p-Xylenes	179601-23-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	< 5.0	U	**1.9**	J	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0
Methyl tert-butyl ether	1634-04-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Methylene Chloride	75-09-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Naphthalene	91-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0
N-Butylbenzene	104-51-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
N-Propylbenzene	103-65-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
o-Xylene	95-47-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
P-Isopropyltoluene	99-87-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Sec-Butylbenzene	135-98-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Styrene	100-42-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
tert-Amyl methyl ether	994-05-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Tert-Butylbenzene	98-06-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0
Tetrachloroethylene	127-18-4	5	5.76	µg/L	**0.3**	J	< 1.0	U	**0.54**	J	< 1.0	U	< 1.0	U	< 1.0	U	**0.66**	J	< 1.0	U	**1**		**0.3**	J	< 1.0
Tetrahydrofuran	109-99-9			µg/L	< 2.0	U	**0.74**	J	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Toluene	108-88-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
trans-1,2-Dichloroethene	156-60-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
trans-1,3-Dichloropropene	10061-02-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
Trichloroethene	79-01-6	5	0.518	µg/L	**1.4**		**0.86**	J	**1.9**		**0.24**	J	**2.3**		< 1.0	U	**3.3**		**0.58**	J	**3**		**0.26**	JN	< 1.0
Trichlorofluoromethane	75-69-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Vinyl Chloride	75-01-4	2	0.147	µg/L	< 1.0	U	**0.11**	J	< 1.0	U	< 1.0	UJ	< 1.0	UJ	< 1.0	U	< 1.0	UJ	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0
Xylenes (total)	1330-20-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0

Notes:

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.

NJ: The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

U: Analyte not detected above the laboratory reporting limit

UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

(dup): duplicate sample

µg/L micrograms per liter

Bold: Analyte detected above the laboratory reporting limit (detect)

Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.

VISL: Vapor Intrusion Screening Level

Shade: value exceeds limit

value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	BS21	MW-BS22		MW-BS25		MW-BS25 (dup)		MW-BS26		MW-BS28		MW-BS31		MW-BS32		MW-BS34		MW-BS35		MW-BS36	
				Sample Date	/2019	11/13/2019		11/15/2019		11/15/2019		11/19/2019		11/15/2019		11/15/2019		11/12/2019		11/15/2019		11/12/2019		11/15/2019	
				Formation	rock	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,1-Trichloroethane	71-55-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2-Trichloroethane	79-00-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	U	< 1.0	U	**7.2**		**7.3**		< 1.0	U	**1**		< 1.0	U	**0.89**	J	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethene	75-35-4			µg/L	U	< 1.0	U	**1.3**		**1.4**		< 1.0	U	**1.4**		< 1.0	U	**2.1**		< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloropropene	563-58-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichlorobenzene	87-61-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichloropropane	96-18-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trichlorobenzene	120-82-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trimethylbenzene	95-63-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromoethane	106-93-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dichlorobenzene	95-50-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethane	107-06-2			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethylene (total)	540-59-0			µg/L	U	< 1.0	U	**0.84**	J	**0.88**	J	< 1.0	U	**0.5**	J	**0.74**	J	**1.2**		< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloropropane	78-87-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3,5-Trimethylbenzene	108-67-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichlorobenzene	541-73-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3-Dichloropropane	142-28-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichloropropene, Total	542-75-6			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
1,4-Dichlorobenzene	106-46-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
2,2-Dichloropropane	594-20-7			µg/L	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Chlorotoluene	95-49-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Hexanone	591-78-6			µg/L	UJ	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	UJ
4-Chlorotoluene	106-43-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
4-Methyl-2-Pentanone	108-10-1			µg/L	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Acetone	67-64-1			µg/L	U	< 5.0	U	**2.4**	J	**2.2**	J	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Benzene	71-43-2			µg/L	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Bromobenzene	108-86-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromochloromethane	74-97-5			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromodichloromethane	75-27-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Bromoform	75-25-2			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromomethane	74-83-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon disulfide	75-15-0			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon tetrachloride	56-23-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chlorobenzene	108-90-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloroethane	75-00-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Chloroform	67-66-3			µg/L	U	**0.34**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloromethane	74-87-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
cis-1,2-Dichloroethene	156-59-2			µg/L	U	< 1.0	U	**0.84**	J	**0.88**	J	< 1.0	U	**0.5**	J	**0.74**	J	**1.2**		< 1.0	U	< 1.0	U	< 1.0	U
cis-1,3-Dichloropropene	10061-01-5			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Dibromochloromethane	124-48-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Dibromomethane	74-95-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Dichlorodifluoromethane	75-71-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U
Ethyl ether	60-29-7			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	**BS21**	**MW-BS22**		**MW-BS25**		**MW-BS25 (dup)**		**MW-BS26**		**MW-BS28**		**MW-BS31**		**MW-BS32**		**MW-BS34**		**MW-BS35**		**MW-BS36**	
				Sample Date	**/2019**	**11/13/2019**		**11/15/2019**		**11/15/2019**		**11/19/2019**		**11/15/2019**		**11/15/2019**		**11/12/2019**		**11/15/2019**		**11/12/2019**		**11/15/2019**	
				Formation	**rock**	**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
Ethyl tert-butyl ether	637-92-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethylbenzene	100-41-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Hexachlorobutadiene	87-68-3			µg/L	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U
Isopropyl Ether	108-20-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ
Isopropylbenzene	98-82-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
m-&p-Xylenes	179601-23-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Methyl tert-butyl ether	1634-04-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methylene Chloride	75-09-2			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Naphthalene	91-20-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Butylbenzene	104-51-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Propylbenzene	103-65-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
o-Xylene	95-47-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
P-Isopropyltoluene	99-87-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Sec-Butylbenzene	135-98-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Styrene	100-42-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
tert-Amyl methyl ether	994-05-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tert-Butylbenzene	98-06-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tetrachloroethylene	127-18-4	5	5.76	µg/L	U	< 1.0	U	**0.63**	J	**0.67**	J	< 1.0	U	**1.2**		**0.3**	J	**0.7**	J	< 1.0	U	< 1.0	U	< 1.0	U
Tetrahydrofuran	109-99-9			µg/L	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U
Toluene	108-88-3			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,2-Dichloroethene	156-60-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,3-Dichloropropene	10061-02-6			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Trichloroethene	79-01-6	5	0.518	µg/L	U	< 1.0	U	**0.98**	J	**1**		< 1.0	U	**4.1**		**2.6**		**4.3**		< 1.0	U	< 1.0	U	< 1.0	U
Trichlorofluoromethane	75-69-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Vinyl Chloride	75-01-4	2	0.147	µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.15**	J	< 1.0	U	< 1.0	U	< 1.0	U
Xylenes (total)	1330-20-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

Notes:
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.
NJ: The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
U: Analyte not detected above the laboratory reporting limit
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup): duplicate sample
µg/L micrograms per liter
Bold: Analyte detected above the laboratory reporting limit (detect)
Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.
VISL: Vapor Intrusion Screening Level
Shade: value exceeds limit
value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	MW-BS37		MW-BS38		MW-BS39		MW-BS40		MW-BS46		SW-2A		EW-1		GZW-7-1		GZW-7S		GZW-8-1		GZV
				Sample Date	11/15/2019		11/12/2019		11/13/2019		11/11/2019		11/18/2019		11/14/2019		11/18/2019		11/14/2019		11/13/2019		11/11/2019		11/12
				Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Overburden		Overburden		Overburden		Overburden		Overb
Analyte	Cas No.	Limit	VISL	Unit																					
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,1-Trichloroethane	71-55-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,2-Trichloroethane	79-00-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloroethene	75-35-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.71**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloropropene	563-58-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,3-Trichlorobenzene	87-61-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0
1,2,3-Trichloropropane	96-18-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,4-Trichlorobenzene	120-82-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,4-Trimethylbenzene	95-63-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0
1,2-Dibromoethane	106-93-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dichlorobenzene	95-50-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloroethane	107-06-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloroethylene (total)	540-59-0			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**2.1**		**0.46**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloropropane	78-87-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,3,5-Trimethylbenzene	108-67-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,3-Dichlorobenzene	541-73-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,3-Dichloropropane	142-28-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,3-Dichloropropene, Total	542-75-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
1,4-Dichlorobenzene	106-46-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
2,2-Dichloropropane	594-20-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0
2-Chlorotoluene	95-49-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
2-Hexanone	591-78-6			µg/L	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0
4-Chlorotoluene	106-43-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
4-Methyl-2-Pentanone	108-10-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
Acetone	67-64-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
Benzene	71-43-2			µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50
Bromobenzene	108-86-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromochloromethane	74-97-5			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromodichloromethane	75-27-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Bromoform	75-25-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromomethane	74-83-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
Carbon disulfide	75-15-0			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Carbon tetrachloride	56-23-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chlorobenzene	108-90-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chloroethane	75-00-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Chloroform	67-66-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.9**	J	**0.66**	J	**0.24**	J	**0.99**
Chloromethane	74-87-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
cis-1,2-Dichloroethene	156-59-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**2.1**		**0.46**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
cis-1,3-Dichloropropene	10061-01-5			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
Dibromochloromethane	124-48-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Dibromomethane	74-95-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Dichlorodifluoromethane	75-71-8			µg/L	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
Ethyl ether	60-29-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	MW-BS37		MW-BS38		MW-BS39		MW-BS40		MW-BS46		SW-2A		EW-1		GZW-7-1		GZW-7S		GZW-8-1		GZV
				Sample Date	11/15/2019		11/12/2019		11/13/2019		11/11/2019		11/18/2019		11/14/2019		11/18/2019		11/14/2019		11/13/2019		11/11/2019		11/12
				Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Overburden		Overburden		Overburden		Overburden		Overb
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
Ethyl tert-butyl ether	637-92-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Ethylbenzene	100-41-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Hexachlorobutadiene	87-68-3			µg/L	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60
Isopropyl Ether	108-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Isopropylbenzene	98-82-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
m-&p-Xylenes	179601-23-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
Methyl tert-butyl ether	1634-04-4			µg/L	**0.19**	J	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	**0.17**	J	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Methylene Chloride	75-09-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Naphthalene	91-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0
N-Butylbenzene	104-51-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
N-Propylbenzene	103-65-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
o-Xylene	95-47-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
P-Isopropyltoluene	99-87-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Sec-Butylbenzene	135-98-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Styrene	100-42-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
tert-Amyl methyl ether	994-05-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Tert-Butylbenzene	98-06-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Tetrachloroethylene	127-18-4	5	5.76	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**1.6**		< 1.0
Tetrahydrofuran	109-99-9			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Toluene	108-88-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
trans-1,2-Dichloroethene	156-60-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
trans-1,3-Dichloropropene	10061-02-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
Trichloroethene	79-01-6	5	0.518	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**2**		**1.6**		< 1.0	U	< 1.0	U	**0.24**	J	< 1.0
Trichlorofluoromethane	75-69-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Vinyl Chloride	75-01-4	2	0.147	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	UJ	< 1.0	U	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0
Xylenes (total)	1330-20-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0

Notes:
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.
NJ: The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
U: Analyte not detected above the laboratory reporting limit
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup): duplicate sample
µg/L micrograms per liter
Bold: Analyte detected above the laboratory reporting limit (detect)
Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.
VISL: Vapor Intrusion Screening Level
Shade: value exceeds limit
value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location Sample Date Formation	/-9-1 /2019 urden	GZW-9-2 11/14/2019 Overburden		HA-09 11/13/2019 Overburden		HA-11 11/13/2019 Overburden		HB-10 11/13/2019 Overburden		HB-10S 11/12/2019 Overburden		HB-11 11/12/2019 Overburden		HB-12 11/11/2019 Overburden		HB-620 11/11/2019 Overburden		HB-620 (dup) 11/11/2019 Overburden		HBPZ-2R 11/11/2019 Overburden	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,1-Trichloroethane	71-55-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.34**	J	< 1.0	U	< 1.0	U	**0.2**	J
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2-Trichloroethane	79-00-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethene	75-35-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloropropene	563-58-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichlorobenzene	87-61-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
1,2,3-Trichloropropane	96-18-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trichlorobenzene	120-82-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trimethylbenzene	95-63-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromoethane	106-93-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dichlorobenzene	95-50-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethane	107-06-2			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethylene (total)	540-59-0			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.45**	J	**1.3**		**0.5**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloropropane	78-87-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3,5-Trimethylbenzene	108-67-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichlorobenzene	541-73-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3-Dichloropropane	142-28-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichloropropene, Total	542-75-6			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
1,4-Dichlorobenzene	106-46-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
2,2-Dichloropropane	594-20-7			µg/L	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Chlorotoluene	95-49-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Hexanone	591-78-6			µg/L	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
4-Chlorotoluene	106-43-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
4-Methyl-2-Pentanone	108-10-1			µg/L	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Acetone	67-64-1			µg/L	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Benzene	71-43-2			µg/L	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Bromobenzene	108-86-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromochloromethane	74-97-5			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromodichloromethane	75-27-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Bromoform	75-25-2			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromomethane	74-83-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon disulfide	75-15-0			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon tetrachloride	56-23-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chlorobenzene	108-90-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloroethane	75-00-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Chloroform	67-66-3			µg/L	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloromethane	74-87-3			µg/L	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
cis-1,2-Dichloroethene	156-59-2			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.45**	J	**1.3**		**0.5**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
cis-1,3-Dichloropropene	10061-01-5			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Dibromochloromethane	124-48-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Dibromomethane	74-95-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Dichlorodifluoromethane	75-71-8			µg/L	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethyl ether	60-29-7			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	/-9-1	GZW-9-2		HA-09		HA-11		HB-10		HB-10S		HB-11		HB-12		HB-620		HB-620 (dup)		HBPZ-2R	
				Sample Date	/2019	11/14/2019		11/13/2019		11/13/2019		11/13/2019		11/12/2019		11/12/2019		11/11/2019		11/11/2019		11/11/2019		11/11/2019	
				Formation	urden	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
Ethyl tert-butyl ether	637-92-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethylbenzene	100-41-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Hexachlorobutadiene	87-68-3			µg/L	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U
Isopropyl Ether	108-20-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Isopropylbenzene	98-82-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
m-&p-Xylenes	179601-23-1			µg/L	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Methyl tert-butyl ether	1634-04-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methylene Chloride	75-09-2			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Naphthalene	91-20-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ
N-Butylbenzene	104-51-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Propylbenzene	103-65-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
o-Xylene	95-47-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
P-Isopropyltoluene	99-87-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Sec-Butylbenzene	135-98-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Styrene	100-42-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
tert-Amyl methyl ether	994-05-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tert-Butylbenzene	98-06-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tetrachloroethylene	127-18-4	5	5.76	µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	**25**		**42**		**7.7**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Tetrahydrofuran	109-99-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Toluene	108-88-3			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,2-Dichloroethene	156-60-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,3-Dichloropropene	10061-02-6			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Trichloroethene	79-01-6	5	0.518	µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	**1.7**		**10**		**2.1**		**0.24**	J	< 1.0	U	< 1.0	U	**0.38**	J
Trichlorofluoromethane	75-69-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Vinyl Chloride	75-01-4	2	0.147	µg/L	U	< 1.0	UJ	< 1.0	UJ	< 1.0	UJ	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Xylenes (total)	1330-20-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

Notes:
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.
NJ: The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
U: Analyte not detected above the laboratory reporting limit
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup): duplicate sample
µg/L micrograms per liter
Bold: Analyte detected above the laboratory reporting limit (detect)
Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.
VISL: Vapor Intrusion Screening Level
Shade: value exceeds limit
value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location Sample Date Formation	ML-1-1 11/13/2019 Overburden		ML-1-2 11/18/2019 Overburden		ML-3-1 11/19/2019 Overburden		MW-1 11/14/2019 Overburden		MW-1 (dup) 11/14/2019 Overburden		MW-2 11/11/2019 Overburden		MW-8A 11/13/2019 Overburden		MW-S01 11/15/2019 Overburden		MW-S02 11/14/2019 Overburden		MW-S02 (dup) 11/14/2019 Overburden		MW 11/12 Overb
Analyte	Cas No.	Limit	VISL	Unit																					
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,1-Trichloroethane	71-55-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**0.98**	J	**1**		< 1.0	U	< 1.0	U	**0.47**	J	**0.44**	J	**0.4**	J	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,2-Trichloroethane	79-00-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	< 1.0	U	**0.37**	J	< 1.0	U	**0.91**	J	**1.1**		< 1.0	U	< 1.0	U	**2.4**		< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloroethene	75-35-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**0.98**	J	**1.1**		< 1.0	U	< 1.0	U	**0.86**	J	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloropropene	563-58-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,3-Trichlorobenzene	87-61-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,3-Trichloropropane	96-18-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,4-Trichlorobenzene	120-82-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,4-Trimethylbenzene	95-63-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dibromoethane	106-93-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dichlorobenzene	95-50-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloroethane	107-06-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloroethylene (total)	540-59-0			µg/L	< 1.0	U	**0.22**	J	< 1.0	U	**0.62**	J	**0.57**	J	< 1.0	U	< 1.0	U	**0.63**	J	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloropropane	78-87-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,3,5-Trimethylbenzene	108-67-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,3-Dichlorobenzene	541-73-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,3-Dichloropropane	142-28-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,3-Dichloropropene, Total	542-75-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
1,4-Dichlorobenzene	106-46-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
2,2-Dichloropropane	594-20-7			µg/L	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0
2-Chlorotoluene	95-49-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
2-Hexanone	591-78-6			µg/L	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0
4-Chlorotoluene	106-43-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
4-Methyl-2-Pentanone	108-10-1			µg/L	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
Acetone	67-64-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0
Benzene	71-43-2			µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50
Bromobenzene	108-86-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromochloromethane	74-97-5			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromodichloromethane	75-27-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Bromoform	75-25-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromomethane	74-83-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Carbon disulfide	75-15-0			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Carbon tetrachloride	56-23-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chlorobenzene	108-90-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chloroethane	75-00-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Chloroform	67-66-3			µg/L	< 1.0	U	**0.22**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.45**	J	**0.3**	J	< 1.0	U	< 1.0	U	< 1.0
Chloromethane	74-87-3			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0
cis-1,2-Dichloroethene	156-59-2			µg/L	< 1.0	U	**0.22**	J	< 1.0	U	**0.62**	J	**0.57**	J	< 1.0	U	< 1.0	U	**0.63**	J	< 1.0	U	< 1.0	U	< 1.0
cis-1,3-Dichloropropene	10061-01-5			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
Dibromochloromethane	124-48-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Dibromomethane	74-95-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Dichlorodifluoromethane	75-71-8			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0
Ethyl ether	60-29-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	**ML-1-1**		**ML-1-2**		**ML-3-1**		**MW-1**		**MW-1 (dup)**		**MW-2**		**MW-8A**		**MW-S01**		**MW-S02**		**MW-S02 (dup)**		**MW**
				Sample Date	**11/13/2019**		**11/18/2019**		**11/19/2019**		**11/14/2019**		**11/14/2019**		**11/11/2019**		**11/13/2019**		**11/15/2019**		**11/14/2019**		**11/14/2019**		**11/12**
				Formation	**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overb**
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
Ethyl tert-butyl ether	637-92-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Ethylbenzene	100-41-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Hexachlorobutadiene	87-68-3			µg/L	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60
Isopropyl Ether	108-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Isopropylbenzene	98-82-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
m-&p-Xylenes	179601-23-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
Methyl tert-butyl ether	1634-04-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Methylene Chloride	75-09-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Naphthalene	91-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
N-Butylbenzene	104-51-8			µg/L	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
N-Propylbenzene	103-65-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
o-Xylene	95-47-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
P-Isopropyltoluene	99-87-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Sec-Butylbenzene	135-98-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Styrene	100-42-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
tert-Amyl methyl ether	994-05-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Tert-Butylbenzene	98-06-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Tetrachloroethylene	127-18-4	5	5.76	µg/L	**1.6**		**0.36**	J	< 1.0	U	**0.26**	J	**0.24**	J	**0.22**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Tetrahydrofuran	109-99-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
Toluene	108-88-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
trans-1,2-Dichloroethene	156-60-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
trans-1,3-Dichloropropene	10061-02-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
Trichloroethene	79-01-6	5	0.518	µg/L	**0.25**	J	**0.26**	J	< 1.0	U	**4.6**		**4.9**		< 1.0	U	< 1.0	U	**3.1**		**0.25**	J	**0.24**	J	< 1.0
Trichlorofluoromethane	75-69-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Vinyl Chloride	75-01-4	2	0.147	µg/L	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	UJ	< 1.0	UJ	< 1.0	U	< 1.0	UJ	< 1.0	U	< 1.0	UJ	< 1.0	UJ	< 1.0
Xylenes (total)	1330-20-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0

Notes:
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.
NJ: The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
U: Analyte not detected above the laboratory reporting limit
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup): duplicate sample
µg/L micrograms per liter
Bold: Analyte detected above the laboratory reporting limit (detect)
Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.
VISL: Vapor Intrusion Screening Level
Shade: value exceeds limit
value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location Sample Date Formation	-S03 /2019 urden	MW-S04 11/13/2019 Overburden		MW-S06 11/14/2019 Overburden		MW-S07 11/11/2019 Overburden		MW-S08 11/13/2019 Overburden		MW-S09 11/12/2019 Overburden		MW-S09 (dup) 11/12/2019 Overburden		MW-S11 11/13/2019 Overburden		MW-S12 11/14/2019 Overburden		MW-S12 (dup) 11/14/2019 Overburden		MW-S14 11/12/2019 Overburden	
Analyte	Cas No.	Limit	VISL	Unit																					
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,1-Trichloroethane	71-55-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2-Trichloroethane	79-00-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethene	75-35-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloropropene	563-58-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichlorobenzene	87-61-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	**0.73**	J	**0.75**	J	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichloropropane	96-18-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trichlorobenzene	120-82-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trimethylbenzene	95-63-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromoethane	106-93-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dichlorobenzene	95-50-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethane	107-06-2			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethylene (total)	540-59-0			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloropropane	78-87-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3,5-Trimethylbenzene	108-67-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichlorobenzene	541-73-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3-Dichloropropane	142-28-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichloropropene, Total	542-75-6			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
1,4-Dichlorobenzene	106-46-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
2,2-Dichloropropane	594-20-7			µg/L	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U
2-Chlorotoluene	95-49-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Hexanone	591-78-6			µg/L	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U
4-Chlorotoluene	106-43-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
4-Methyl-2-Pentanone	108-10-1			µg/L	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Acetone	67-64-1			µg/L	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U
Benzene	71-43-2			µg/L	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Bromobenzene	108-86-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromochloromethane	74-97-5			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromodichloromethane	75-27-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Bromoform	75-25-2			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromomethane	74-83-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U
Carbon disulfide	75-15-0			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon tetrachloride	56-23-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chlorobenzene	108-90-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloroethane	75-00-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Chloroform	67-66-3			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloromethane	74-87-3			µg/L	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U
cis-1,2-Dichloroethene	156-59-2			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
cis-1,3-Dichloropropene	10061-01-5			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Dibromochloromethane	124-48-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Dibromomethane	74-95-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Dichlorodifluoromethane	75-71-8			µg/L	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U
Ethyl ether	60-29-7			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U

de maximis, inc.
ddms

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	-S03	MW-S04		MW-S06		MW-S07		MW-S08		MW-S09		MW-S09 (dup)		MW-S11		MW-S12		MW-S12 (dup)		MW-S14	
				Sample Date	/2019	11/13/2019		11/14/2019		11/11/2019		11/13/2019		11/12/2019		11/12/2019		11/13/2019		11/14/2019		11/14/2019		11/12/2019	
				Formation	urden	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
Ethyl tert-butyl ether	637-92-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethylbenzene	100-41-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Hexachlorobutadiene	87-68-3			µg/L	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U
Isopropyl Ether	108-20-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Isopropylbenzene	98-82-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
m-&p-Xylenes	179601-23-1			µg/L	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U
Methyl tert-butyl ether	1634-04-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methylene Chloride	75-09-2			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Naphthalene	91-20-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Butylbenzene	104-51-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Propylbenzene	103-65-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
o-Xylene	95-47-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
P-Isopropyltoluene	99-87-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Sec-Butylbenzene	135-98-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Styrene	100-42-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
tert-Amyl methyl ether	994-05-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tert-Butylbenzene	98-06-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tetrachloroethylene	127-18-4	5	5.76	µg/L	U	< 1.0	U	**3.3**		**4.8**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Tetrahydrofuran	109-99-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Toluene	108-88-3			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,2-Dichloroethene	156-60-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,3-Dichloropropene	10061-02-6			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Trichloroethene	79-01-6	5	0.518	µg/L	U	< 1.0	U	**0.48**	J	**0.54**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Trichlorofluoromethane	75-69-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Vinyl Chloride	75-01-4	2	0.147	µg/L	U	< 1.0	U	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	UJ	< 1.0	UJ	< 1.0	UJ	< 1.0	U
Xylenes (total)	1330-20-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

Notes:

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.

NJ: The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.

U: Analyte not detected above the laboratory reporting limit

UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

(dup): duplicate sample

µg/L micrograms per liter

Bold: Analyte detected above the laboratory reporting limit (detect)

Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.

VISL: Vapor Intrusion Screening Level

Shade: value exceeds limit

value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location Sample Date Formation	MW-S15 11/15/2019 Overburden		MW-S16 11/12/2019 Overburden		MW-S16 (dup) 11/12/2019 Overburden		MW-S17 11/12/2019 Overburden		MW-S18 11/11/2019 Overburden		MW-S19 11/11/2019 Overburden		MW-S20 11/12/2019 Overburden		MW-S21 11/14/2019 Overburden		MW-S22 11/13/2019 Overburden		MW-S23 11/13/2019 Overburden		MW 11/13 Overb
Analyte	Cas No.	Limit	VISL	Unit																					
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,1-Trichloroethane	71-55-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.18**
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,2-Trichloroethane	79-00-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloroethene	75-35-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloropropene	563-58-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,3-Trichlorobenzene	87-61-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,3-Trichloropropane	96-18-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,4-Trichlorobenzene	120-82-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,4-Trimethylbenzene	95-63-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0
1,2-Dibromoethane	106-93-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dichlorobenzene	95-50-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloroethane	107-06-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloroethylene (total)	540-59-0			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**1.2**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloropropane	78-87-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,3,5-Trimethylbenzene	108-67-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,3-Dichlorobenzene	541-73-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,3-Dichloropropane	142-28-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,3-Dichloropropene, Total	542-75-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
1,4-Dichlorobenzene	106-46-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
2,2-Dichloropropane	594-20-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0
2-Chlorotoluene	95-49-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
2-Hexanone	591-78-6			µg/L	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0
4-Chlorotoluene	106-43-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
4-Methyl-2-Pentanone	108-10-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
Acetone	67-64-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
Benzene	71-43-2			µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50
Bromobenzene	108-86-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromochloromethane	74-97-5			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromodichloromethane	75-27-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Bromoform	75-25-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromomethane	74-83-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
Carbon disulfide	75-15-0			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Carbon tetrachloride	56-23-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chlorobenzene	108-90-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chloroethane	75-00-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Chloroform	67-66-3			µg/L	< 1.0	U	**0.86**	J	**0.88**	J	**0.28**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.28**
Chloromethane	74-87-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
cis-1,2-Dichloroethene	156-59-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**1.2**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
cis-1,3-Dichloropropene	10061-01-5			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
Dibromochloromethane	124-48-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Dibromomethane	74-95-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Dichlorodifluoromethane	75-71-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
Ethyl ether	60-29-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0

de maximis, inc.
ddms

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	**MW-S15**		**MW-S16**		**MW-S16 (dup)**		**MW-S17**		**MW-S18**		**MW-S19**		**MW-S20**		**MW-S21**		**MW-S22**		**MW-S23**		**MW**
				Sample Date	**11/15/2019**		**11/12/2019**		**11/12/2019**		**11/12/2019**		**11/11/2019**		**11/11/2019**		**11/12/2019**		**11/14/2019**		**11/13/2019**		**11/13/2019**		**11/13**
				Formation	**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overb**
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
Ethyl tert-butyl ether	637-92-3			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Ethylbenzene	100-41-4			μg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Hexachlorobutadiene	87-68-3			μg/L	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60
Isopropyl Ether	108-20-3			μg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Isopropylbenzene	98-82-8			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
m-&p-Xylenes	179601-23-1			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Methyl Ethyl Ketone (2-Butanone)	78-93-3			μg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
Methyl tert-butyl ether	1634-04-4			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Methylene Chloride	75-09-2			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Naphthalene	91-20-3			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
N-Butylbenzene	104-51-8			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
N-Propylbenzene	103-65-1			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
o-Xylene	95-47-6			μg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
P-Isopropyltoluene	99-87-6			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Sec-Butylbenzene	135-98-8			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Styrene	100-42-5			μg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
tert-Amyl methyl ether	994-05-8			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Tert-Butylbenzene	98-06-6			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Tetrachloroethylene	127-18-4	5	5.76	μg/L	< 1.0	U	< 1.0	U	< 1.0	U	**6.8**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.21**
Tetrahydrofuran	109-99-9			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Toluene	108-88-3			μg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
trans-1,2-Dichloroethene	156-60-5			μg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
trans-1,3-Dichloropropene	10061-02-6			μg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
Trichloroethene	79-01-6	5	0.518	μg/L	< 1.0	U	< 1.0	U	< 1.0	U	**0.68**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.42**
Trichlorofluoromethane	75-69-4			μg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Vinyl Chloride	75-01-4	2	0.147	μg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.46**	J	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0
Xylenes (total)	1330-20-7			μg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0

Notes:
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.
NJ: The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
U: Analyte not detected above the laboratory reporting limit
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup): duplicate sample
μg/L micrograms per liter
Bold: Analyte detected above the laboratory reporting limit (detect)
Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.
VISL: Vapor Intrusion Screening Level
Shade: value exceeds limit
value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location Sample Date Formation	-S24 /2019 urden	MW-S26 11/15/2019 Overburden		MW-S27 11/13/2019 Overburden		MW-S28 11/14/2019 Overburden		MW-S29 11/13/2019 Overburden		MW-S30 11/15/2019 Overburden		MW-S32 11/13/2019 Overburden		MW-S35 11/12/2019 Overburden		MW-S36 11/11/2019 Overburden		MW-S37 11/13/2019 Overburden		MW-S38 11/13/2019 Overburden	
Analyte	Cas No.	Limit	VISL	Unit																					
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,1-Trichloroethane	71-55-6			µg/L	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**2**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2-Trichloroethane	79-00-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.55**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethene	75-35-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**1.2**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloropropene	563-58-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichlorobenzene	87-61-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U
1,2,3-Trichloropropane	96-18-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trichlorobenzene	120-82-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trimethylbenzene	95-63-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ
1,2-Dibromoethane	106-93-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dichlorobenzene	95-50-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethane	107-06-2			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethylene (total)	540-59-0			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.19**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloropropane	78-87-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3,5-Trimethylbenzene	108-67-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichlorobenzene	541-73-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3-Dichloropropane	142-28-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichloropropene, Total	542-75-6			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
1,4-Dichlorobenzene	106-46-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
2,2-Dichloropropane	594-20-7			µg/L	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U
2-Chlorotoluene	95-49-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Hexanone	591-78-6			µg/L	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ
4-Chlorotoluene	106-43-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
4-Methyl-2-Pentanone	108-10-1			µg/L	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ
Acetone	67-64-1			µg/L	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U
Benzene	71-43-2			µg/L	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Bromobenzene	108-86-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromochloromethane	74-97-5			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromodichloromethane	75-27-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Bromoform	75-25-2			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromomethane	74-83-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon disulfide	75-15-0			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon tetrachloride	56-23-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chlorobenzene	108-90-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloroethane	75-00-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Chloroform	67-66-3			µg/L	J	< 1.0	U	**0.46**	J	< 1.0	U	< 1.0	U	**0.29**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloromethane	74-87-3			µg/L	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ
cis-1,2-Dichloroethene	156-59-2			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.19**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
cis-1,3-Dichloropropene	10061-01-5			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Dibromochloromethane	124-48-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Dibromomethane	74-95-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Dichlorodifluoromethane	75-71-8			µg/L	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ
Ethyl ether	60-29-7			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U

de maximis, inc.
ddms

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	**-S24**	**MW-S26**		**MW-S27**		**MW-S28**		**MW-S29**		**MW-S30**		**MW-S32**		**MW-S35**		**MW-S36**		**MW-S37**		**MW-S38**	
				Sample Date	**/2019**	**11/15/2019**		**11/13/2019**		**11/14/2019**		**11/13/2019**		**11/15/2019**		**11/13/2019**		**11/12/2019**		**11/11/2019**		**11/13/2019**		**11/13/2019**	
				Formation	**urden**	**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
Ethyl tert-butyl ether	637-92-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethylbenzene	100-41-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Hexachlorobutadiene	87-68-3			µg/L	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U
Isopropyl Ether	108-20-3			µg/L	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Isopropylbenzene	98-82-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
m-&p-Xylenes	179601-23-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	UJ	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ
Methyl tert-butyl ether	1634-04-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	**0.22**	J	< 2.0	U	< 2.0	U
Methylene Chloride	75-09-2			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Naphthalene	91-20-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U
N-Butylbenzene	104-51-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Propylbenzene	103-65-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
o-Xylene	95-47-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
P-Isopropyltoluene	99-87-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Sec-Butylbenzene	135-98-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Styrene	100-42-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
tert-Amyl methyl ether	994-05-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tert-Butylbenzene	98-06-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tetrachloroethylene	127-18-4	5	5.76	µg/L	J	< 1.0	U	**2.7**		< 1.0	U	< 1.0	U	**1.7**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Tetrahydrofuran	109-99-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Toluene	108-88-3			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,2-Dichloroethene	156-60-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,3-Dichloropropene	10061-02-6			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Trichloroethene	79-01-6	5	0.518	µg/L	J	**0.19**	J	**0.3**	J	< 1.0	U	< 1.0	U	**0.23**	J	**4.9**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Trichlorofluoromethane	75-69-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Vinyl Chloride	75-01-4	2	0.147	µg/L	UJ	< 1.0	U	< 1.0	UJ	< 1.0	UJ	< 1.0	UJ	< 1.0	U	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	UJ	< 1.0	UJ
Xylenes (total)	1330-20-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

Notes:

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.

NJ: The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

U: Analyte not detected above the laboratory reporting limit

UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

(dup): duplicate sample

µg/L micrograms per liter

Bold: Analyte detected above the laboratory reporting limit (detect)

Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.

VISL: Vapor Intrusion Screening Level

Shade: value exceeds limit

value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	MW-S39		MW-S40		MW-SD01		MW-SD02		MW-SD06		MW-SD10		MW-SD13		MW-SD17		MW-SD26		MW-SD27	
				Sample Date	11/14/2019		11/14/2019		11/14/2019		11/12/2019		11/14/2019		11/12/2019		11/12/2019		11/12/2019		11/18/2019		11/12/2019	
				Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																				
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,1-Trichloroethane	71-55-6			µg/L	< 1.0	U	< 1.0	U	**0.39**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2-Trichloroethane	79-00-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.35**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethene	75-35-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloropropene	563-58-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichlorobenzene	87-61-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichloropropane	96-18-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trichlorobenzene	120-82-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trimethylbenzene	95-63-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U
1,2-Dibromoethane	106-93-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dichlorobenzene	95-50-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethane	107-06-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethylene (total)	540-59-0			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloropropane	78-87-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3,5-Trimethylbenzene	108-67-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichlorobenzene	541-73-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3-Dichloropropane	142-28-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichloropropene, Total	542-75-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
1,4-Dichlorobenzene	106-46-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
2,2-Dichloropropane	594-20-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Chlorotoluene	95-49-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Hexanone	591-78-6			µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U
4-Chlorotoluene	106-43-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
4-Methyl-2-Pentanone	108-10-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U
Acetone	67-64-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Benzene	71-43-2			µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Bromobenzene	108-86-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromochloromethane	74-97-5			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromodichloromethane	75-27-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Bromoform	75-25-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromomethane	74-83-9			µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon disulfide	75-15-0			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon tetrachloride	56-23-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chlorobenzene	108-90-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloroethane	75-00-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Chloroform	67-66-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**0.77**	J	**0.36**	J	**1.9**		**0.34**	J	**0.4**	J	**1.5**		**0.77**	J
Chloromethane	74-87-3			µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
cis-1,2-Dichloroethene	156-59-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
cis-1,3-Dichloropropene	10061-01-5			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Dibromochloromethane	124-48-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Dibromomethane	74-95-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Dichlorodifluoromethane	75-71-8			µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U
Ethyl ether	60-29-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U

de maximis, inc.
ddms

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	**MW-S39**		**MW-S40**		**MW-SD01**		**MW-SD02**		**MW-SD06**		**MW-SD10**		**MW-SD13**		**MW-SD17**		**MW-SD26**		**MW-SD27**	
				Sample Date	**11/14/2019**		**11/14/2019**		**11/14/2019**		**11/12/2019**		**11/14/2019**		**11/12/2019**		**11/12/2019**		**11/12/2019**		**11/18/2019**		**11/12/2019**	
				Formation	**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																				
Ethyl tert-butyl ether	637-92-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethylbenzene	100-41-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Hexachlorobutadiene	87-68-3			µg/L	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U
Isopropyl Ether	108-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Isopropylbenzene	98-82-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
m-&p-Xylenes	179601-23-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Methyl tert-butyl ether	1634-04-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methylene Chloride	75-09-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Naphthalene	91-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U
N-Butylbenzene	104-51-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Propylbenzene	103-65-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
o-Xylene	95-47-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
P-Isopropyltoluene	99-87-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Sec-Butylbenzene	135-98-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Styrene	100-42-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
tert-Amyl methyl ether	994-05-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tert-Butylbenzene	98-06-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U
Tetrachloroethylene	127-18-4	5	5.76	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**1.1**		< 1.0	U	< 1.0	U	**1.6**		**0.23**	J	**0.26**	J
Tetrahydrofuran	109-99-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U
Toluene	108-88-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,2-Dichloroethene	156-60-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,3-Dichloropropene	10061-02-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Trichloroethene	79-01-6	5	0.518	µg/L	< 1.0	U	< 1.0	U	**0.23**	J	< 1.0	U	**0.86**	J	< 1.0	U	**0.36**	J	**0.36**	J	**0.46**	J	< 1.0	U
Trichlorofluoromethane	75-69-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U
Vinyl Chloride	75-01-4	2	0.147	µg/L	< 1.0	UJ	< 1.0	UJ	< 1.0	UJ	< 1.0	U	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Xylenes (total)	1330-20-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

Notes:

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.

NJ: The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.

U: Analyte not detected above the laboratory reporting limit

UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

(dup): duplicate sample

µg/L micrograms per liter

Bold: Analyte detected above the laboratory reporting limit (detect)

Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.

VISL: Vapor Intrusion Screening Level

Shade: value exceeds limit

value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

Analyte	Cas No.	Limit	VISL	Sample Location / Sample Date / Formation / Unit	MW-SD29 11/14/2019 Overburden		MW-SD30 11/12/2019 Overburden		MW-SD32 11/15/2019 Overburden		MW-SD34 11/14/2019 Overburden		MW-SD35 11/13/2019 Overburden		MW-SD36 11/18/2019 Overburden		MW-SD36 (dup) 11/18/2019 Overburden		MW-SD37 11/18/2019 Overburden		MW-SD38 11/15/2019 Overburden		MW-SD39 11/15/2019 Overburden	
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,1-Trichloroethane	71-55-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2-Trichloroethane	79-00-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**0.64**	J	< 1.0	U	< 1.0	U	< 1.0	U	**0.28**	J	< 1.0	U	< 1.0	U
1,1-Dichloroethene	75-35-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**1.1**		< 1.0	U	< 1.0	U	< 1.0	U	**0.82**	J	**1.5**		< 1.0	U
1,1-Dichloropropene	563-58-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichlorobenzene	87-61-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichloropropane	96-18-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trichlorobenzene	120-82-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trimethylbenzene	95-63-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromoethane	106-93-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dichlorobenzene	95-50-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethane	107-06-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethylene (total)	540-59-0			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**0.67**	J	< 1.0	U	**0.49**	J	**0.53**	J	**1.5**		< 1.0	U	< 1.0	U
1,2-Dichloropropane	78-87-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3,5-Trimethylbenzene	108-67-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichlorobenzene	541-73-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3-Dichloropropane	142-28-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichloropropene, Total	542-75-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
1,4-Dichlorobenzene	106-46-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
2,2-Dichloropropane	594-20-7			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Chlorotoluene	95-49-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Hexanone	591-78-6			µg/L	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ
4-Chlorotoluene	106-43-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
4-Methyl-2-Pentanone	108-10-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U
Acetone	67-64-1			µg/L	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Benzene	71-43-2			µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Bromobenzene	108-86-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromochloromethane	74-97-5			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromodichloromethane	75-27-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Bromoform	75-25-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromomethane	74-83-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon disulfide	75-15-0			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon tetrachloride	56-23-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chlorobenzene	108-90-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloroethane	75-00-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Chloroform	67-66-3			µg/L	**0.89**	J	**0.87**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloromethane	74-87-3			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
cis-1,2-Dichloroethene	156-59-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**0.67**	J	< 1.0	U	**0.49**	J	**0.53**	J	**1.5**		< 1.0	U	< 1.0	U
cis-1,3-Dichloropropene	10061-01-5			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Dibromochloromethane	124-48-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Dibromomethane	74-95-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Dichlorodifluoromethane	75-71-8			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U
Ethyl ether	60-29-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	**MW-SD29**		**MW-SD30**		**MW-SD32**		**MW-SD34**		**MW-SD35**		**MW-SD36**		**MW-SD36 (dup)**		**MW-SD37**		**MW-SD38**		**MW-SD39**	
				Sample Date	**11/14/2019**		**11/12/2019**		**11/15/2019**		**11/14/2019**		**11/13/2019**		**11/18/2019**		**11/18/2019**		**11/18/2019**		**11/15/2019**		**11/15/2019**	
				Formation	**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																				
Ethyl tert-butyl ether	637-92-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethylbenzene	100-41-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Hexachlorobutadiene	87-68-3			µg/L	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U
Isopropyl Ether	108-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Isopropylbenzene	98-82-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
m-&p-Xylenes	179601-23-1			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Methyl tert-butyl ether	1634-04-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	**0.27**	J	**0.23**	J	**1.8**	J	< 2.0	U	**0.97**	J
Methylene Chloride	75-09-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Naphthalene	91-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U
N-Butylbenzene	104-51-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Propylbenzene	103-65-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
o-Xylene	95-47-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
P-Isopropyltoluene	99-87-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Sec-Butylbenzene	135-98-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Styrene	100-42-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
tert-Amyl methyl ether	994-05-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tert-Butylbenzene	98-06-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U
Tetrachloroethylene	127-18-4	5	5.76	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	**0.49**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Tetrahydrofuran	109-99-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ
Toluene	108-88-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,2-Dichloroethene	156-60-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,3-Dichloropropene	10061-02-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Trichloroethene	79-01-6	5	0.518	µg/L	< 1.0	U	< 1.0	U	**0.26**	J	**3.8**		**0.51**	J	**0.97**	J	**0.87**	J	**4.3**		< 1.0	U	< 1.0	U
Trichlorofluoromethane	75-69-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U
Vinyl Chloride	75-01-4	2	0.147	µg/L	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	U	**0.08**	J	**0.24**	J+	< 1.0	U
Xylenes (total)	1330-20-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

Notes:
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.
NJ: The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.
U: Analyte not detected above the laboratory reporting limit
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup): duplicate sample
µg/L micrograms per liter
Bold: Analyte detected above the laboratory reporting limit (detect)
Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.
VISL: Vapor Intrusion Screening Level
Shade: value exceeds limit
value: value exceed VISL

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location Sample Date Formation	MW-SD40 11/14/2019 Overburden		MW-SD40 (dup) 11/14/2019 Overburden		MW-SD41 11/15/2019 Overburden		MW-SD41 (dup) 11/15/2019 Overburden		MW-SD42A 11/15/2019 Overburden		MW-SD43 11/15/2019 Overburden		MW-SD44 11/15/2019 Overburden		MW-SD45 11/14/2019 Overburden		MW-SD46 11/18/2019 Overburden		MW-SD46 (dup) 11/18/2019 Overburden		MW- 11/11 Overb
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,1-Trichloroethane	71-55-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1,2-Trichloroethane	79-00-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloroethene	75-35-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**1.6**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,1-Dichloropropene	563-58-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,3-Trichlorobenzene	87-61-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,3-Trichloropropane	96-18-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,4-Trichlorobenzene	120-82-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2,4-Trimethylbenzene	95-63-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dibromoethane	106-93-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,2-Dichlorobenzene	95-50-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloroethane	107-06-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloroethylene (total)	540-59-0			µg/L	< 1.0	U	**0.29**	J	< 1.0	U	< 1.0	U	< 1.0	U	**0.86**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,2-Dichloropropane	78-87-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,3,5-Trimethylbenzene	108-67-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,3-Dichlorobenzene	541-73-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
1,3-Dichloropropane	142-28-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
1,3-Dichloropropene, Total	542-75-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
1,4-Dichlorobenzene	106-46-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
2,2-Dichloropropane	594-20-7			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0
2-Chlorotoluene	95-49-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
2-Hexanone	591-78-6			µg/L	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
4-Chlorotoluene	106-43-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
4-Methyl-2-Pentanone	108-10-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
Acetone	67-64-1			µg/L	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0
Benzene	71-43-2			µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50
Bromobenzene	108-86-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromochloromethane	74-97-5			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromodichloromethane	75-27-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Bromoform	75-25-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Bromomethane	74-83-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Carbon disulfide	75-15-0			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Carbon tetrachloride	56-23-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chlorobenzene	108-90-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chloroethane	75-00-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Chloroform	67-66-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Chloromethane	74-87-3			µg/L	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
cis-1,2-Dichloroethene	156-59-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.86**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
cis-1,3-Dichloropropene	10061-01-5			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
Dibromochloromethane	124-48-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Dibromomethane	74-95-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Dichlorodifluoromethane	75-71-8			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
Ethyl ether	60-29-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0

de maximis, inc.
ddms

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	MW-SD40		MW-SD40 (dup)		MW-SD41		MW-SD41 (dup)		MW-SD42A		MW-SD43		MW-SD44		MW-SD45		MW-SD46		MW-SD46 (dup)		MW-
				Sample Date	11/14/2019		11/14/2019		11/15/2019		11/15/2019		11/15/2019		11/15/2019		11/15/2019		11/14/2019		11/18/2019		11/18/2019		11/11
				Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overb
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
Ethyl tert-butyl ether	637-92-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Ethylbenzene	100-41-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Hexachlorobutadiene	87-68-3			µg/L	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60
Isopropyl Ether	108-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Isopropylbenzene	98-82-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
m-&p-Xylenes	179601-23-1			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0
Methyl tert-butyl ether	1634-04-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	**2.1**		< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Methylene Chloride	75-09-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Naphthalene	91-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
N-Butylbenzene	104-51-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0
N-Propylbenzene	103-65-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
o-Xylene	95-47-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
P-Isopropyltoluene	99-87-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Sec-Butylbenzene	135-98-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Styrene	100-42-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
tert-Amyl methyl ether	994-05-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Tert-Butylbenzene	98-06-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Tetrachloroethylene	127-18-4	5	5.76	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Tetrahydrofuran	109-99-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Toluene	108-88-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
trans-1,2-Dichloroethene	156-60-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
trans-1,3-Dichloropropene	10061-02-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40
Trichloroethene	79-01-6	5	0.518	µg/L	**1**		**1**		< 1.0	U	< 1.0	U	< 1.0	U	**2**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0
Trichlorofluoromethane	75-69-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0
Vinyl Chloride	75-01-4	2	0.147	µg/L	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.44**	J+	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0
Xylenes (total)	1330-20-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0

Notes:
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.
NJ: The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
U: Analyte not detected above the laboratory reporting limit
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup): duplicate sample
µg/L micrograms per liter
Bold: Analyte detected above the laboratory reporting limit (detect)
Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.
VISL: Vapor Intrusion Screening Level
Shade: value exceeds limit
value: value exceed VISL

de maximis, inc.
ddms

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location Sample Date Formation	SM13 /2019 urden	MW-SM46 11/15/2019 Overburden		MW-T10 11/14/2019 Overburden		MW-T24 11/13/2019 Overburden		OW-2 11/11/2019 Overburden		OW-3 11/13/2019 Overburden		P-1 11/18/2019 Overburden		P-1A 11/15/2019 Overburden		P-2 11/15/2019 Overburden		P-3 11/15/2019 Overburden		P-4 11/13/2019 Overburden	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																						
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,1-Trichloroethane	71-55-6			µg/L	U	< 1.0	U	< 1.0	U	**1.3**		< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2-Trichloroethane	79-00-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	U	< 1.0	U	**0.61**	J	**0.77**	J	**0.3**	J	< 1.0	U	**0.3**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethene	75-35-4			µg/L	U	**1.1**		**0.3**	J	**4.3**		< 1.0	U	< 1.0	U	**0.18**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloropropene	563-58-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichlorobenzene	87-61-6			µg/L	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichloropropane	96-18-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trichlorobenzene	120-82-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trimethylbenzene	95-63-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ
1,2-Dibromoethane	106-93-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dichlorobenzene	95-50-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethane	107-06-2			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethylene (total)	540-59-0			µg/L	U	< 1.0	U	**1.2**	J	< 1.0	U	< 1.0	U	< 1.0	U	**0.25**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloropropane	78-87-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3,5-Trimethylbenzene	108-67-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichlorobenzene	541-73-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3-Dichloropropane	142-28-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichloropropene, Total	542-75-6			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
1,4-Dichlorobenzene	106-46-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
2,2-Dichloropropane	594-20-7			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Chlorotoluene	95-49-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Hexanone	591-78-6			µg/L	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	UJ	< 5.0	U
4-Chlorotoluene	106-43-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
4-Methyl-2-Pentanone	108-10-1			µg/L	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Acetone	67-64-1			µg/L	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Benzene	71-43-2			µg/L	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Bromobenzene	108-86-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromochloromethane	74-97-5			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromodichloromethane	75-27-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Bromoform	75-25-2			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromomethane	74-83-9			µg/L	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon disulfide	75-15-0			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon tetrachloride	56-23-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chlorobenzene	108-90-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloroethane	75-00-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Chloroform	67-66-3			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	**0.54**	J	< 1.0	U	**0.32**	J	**0.35**	J	< 1.0	U	< 1.0	U	**0.91**	J
Chloromethane	74-87-3			µg/L	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ
cis-1,2-Dichloroethene	156-59-2			µg/L	U	< 1.0	U	**0.95**	J	< 1.0	U	< 1.0	U	< 1.0	U	**0.25**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
cis-1,3-Dichloropropene	10061-01-5			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Dibromochloromethane	124-48-1			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Dibromomethane	74-95-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Dichlorodifluoromethane	75-71-8			µg/L	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ
Ethyl ether	60-29-7			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	**SM13**	**MW-SM46**		**MW-T10**		**MW-T24**		**OW-2**		**OW-3**		**P-1**		**P-1A**		**P-2**		**P-3**		**P-4**	
				Sample Date	**/2019**	**11/15/2019**		**11/14/2019**		**11/13/2019**		**11/11/2019**		**11/13/2019**		**11/18/2019**		**11/15/2019**		**11/15/2019**		**11/15/2019**		**11/13/2019**	
				Formation	**urden**	**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**																					
Ethyl tert-butyl ether	637-92-3			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethylbenzene	100-41-4			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Hexachlorobutadiene	87-68-3			µg/L	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U
Isopropyl Ether	108-20-3			µg/L	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	UJ
Isopropylbenzene	98-82-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
m-&p-Xylenes	179601-23-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Methyl tert-butyl ether	1634-04-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methylene Chloride	75-09-2			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Naphthalene	91-20-3			µg/L	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Butylbenzene	104-51-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Propylbenzene	103-65-1			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
o-Xylene	95-47-6			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
P-Isopropyltoluene	99-87-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Sec-Butylbenzene	135-98-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Styrene	100-42-5			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
tert-Amyl methyl ether	994-05-8			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tert-Butylbenzene	98-06-6			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tetrachloroethylene	127-18-4	5	5.76	µg/L	U	< 1.0	U	< 1.0	U	**1.8**		< 1.0	U	**1.3**		**2.3**		**4**		**3.8**		**2.9**		**0.35**	J
Tetrahydrofuran	109-99-9			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U
Toluene	108-88-3			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,2-Dichloroethene	156-60-5			µg/L	U	< 1.0	U	**0.27**	J	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,3-Dichloropropene	10061-02-6			µg/L	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Trichloroethene	79-01-6	5	0.518	µg/L	U	**0.38**	J	**7.8**		**4.6**		< 1.0	U	< 1.0	U	**0.81**	J	**0.49**	J	**0.47**	J	**0.28**	J	< 1.0	U
Trichlorofluoromethane	75-69-4			µg/L	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Vinyl Chloride	75-01-4	2	0.147	µg/L	U	**0.18**	J	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Xylenes (total)	1330-20-7			µg/L	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

Notes:

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.

NJ: The analyte has been "tentatively identified" or "presumptively" as present and the associated numerical value is the estimated concentration in the sample.

U: Analyte not detected above the laboratory reporting limit

UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

(dup): duplicate sample

µg/L micrograms per liter

Bold: Analyte detected above the laboratory reporting limit (detect)

Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.

VISL: Vapor Intrusion Screening Level

Shade: value exceeds limit

value: value exceed VISL

de maximis, inc.
ddms

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	PT-09		PT-11P		PW-6		PW-6 (dup)		SW-1	
				Sample Date	11/18/2019		11/13/2019		11/13/2019		11/13/2019		11/14/2019	
				Formation	Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**										
1,1,1,2-Tetrachloroethane	630-20-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,1-Trichloroethane	71-55-6			µg/L	< 1.0	U	**0.51**	J	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2,2-Tetrachloroethane	79-34-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1,2-Trichloroethane	79-00-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethane	75-34-3	2.7	7.64	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloroethene	75-35-4			µg/L	< 1.0	U	**0.29**	J	< 1.0	U	< 1.0	U	< 1.0	U
1,1-Dichloropropene	563-58-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichlorobenzene	87-61-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,3-Trichloropropane	96-18-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trichlorobenzene	120-82-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2,4-Trimethylbenzene	95-63-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dibromo-3-chloropropane	96-12-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	U
1,2-Dibromoethane	106-93-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,2-Dichlorobenzene	95-50-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethane	107-06-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloroethylene (total)	540-59-0			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,2-Dichloropropane	78-87-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3,5-Trimethylbenzene	108-67-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichlorobenzene	541-73-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
1,3-Dichloropropane	142-28-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
1,3-Dichloropropene, Total	542-75-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
1,4-Dichlorobenzene	106-46-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
2,2-Dichloropropane	594-20-7			µg/L	< 2.0	U	< 2.0	UJ	< 2.0	UJ	< 2.0	UJ	< 2.0	U
2-Chlorotoluene	95-49-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
2-Hexanone	591-78-6			µg/L	< 5.0	UJ	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U
4-Chlorotoluene	106-43-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
4-Methyl-2-Pentanone	108-10-1			µg/L	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U	< 5.0	U
Acetone	67-64-1			µg/L	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U
Benzene	71-43-2			µg/L	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U	< 0.50	U
Bromobenzene	108-86-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromochloromethane	74-97-5			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromodichloromethane	75-27-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Bromoform	75-25-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Bromomethane	74-83-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon disulfide	75-15-0			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Carbon tetrachloride	56-23-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chlorobenzene	108-90-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Chloroethane	75-00-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Chloroform	67-66-3			µg/L	< 1.0	U	< 1.0	U	**0.78**	J	**0.81**	J	**0.48**	J
Chloromethane	74-87-3			µg/L	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	UJ
cis-1,2-Dichloroethene	156-59-2			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
cis-1,3-Dichloropropene	10061-01-5			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Dibromochloromethane	124-48-1			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Dibromomethane	74-95-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Dichlorodifluoromethane	75-71-8			µg/L	< 2.0	U	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U
Ethyl ether	60-29-7			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U

Table 2-5. Volatile Organic Compounds - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	**PT-09**		**PT-11P**		**PW-6**		**PW-6 (dup)**		**SW-1**	
				Sample Date	**11/18/2019**		**11/13/2019**		**11/13/2019**		**11/13/2019**		**11/14/2019**	
				Formation	**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**	
Analyte	**Cas No.**	**Limit**	**VISL**	**Unit**										
Ethyl tert-butyl ether	637-92-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Ethylbenzene	100-41-4			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
Hexachlorobutadiene	87-68-3			µg/L	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U	< 0.60	U
Isopropyl Ether	108-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Isopropylbenzene	98-82-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
m-&p-Xylenes	179601-23-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methyl Ethyl Ketone (2-Butanone)	78-93-3			µg/L	< 5.0	U	< 5.0	UJ	< 5.0	U	< 5.0	U	< 5.0	U
Methyl tert-butyl ether	1634-04-4			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Methylene Chloride	75-09-2			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Naphthalene	91-20-3			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Butylbenzene	104-51-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
N-Propylbenzene	103-65-1			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
o-Xylene	95-47-6			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
P-Isopropyltoluene	99-87-6			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Sec-Butylbenzene	135-98-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Styrene	100-42-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
tert-Amyl methyl ether	994-05-8			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tert-Butylbenzene	98-06-6			µg/L	< 2.0	UJ	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Tetrachloroethylene	127-18-4	5	5.76	µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	**1.2**	
Tetrahydrofuran	109-99-9			µg/L	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U	< 2.0	U
Toluene	108-88-3			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,2-Dichloroethene	156-60-5			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U
trans-1,3-Dichloropropene	10061-02-6			µg/L	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U	< 0.40	U
Trichloroethene	79-01-6	5	0.518	µg/L	**0.36**	J	**2**		< 1.0	U	< 1.0	U	**0.26**	J
Trichlorofluoromethane	75-69-4			µg/L	< 2.0	U	**0.25**	J	< 2.0	U	< 2.0	U	< 2.0	U
Vinyl Chloride	75-01-4	2	0.147	µg/L	< 1.0	U	< 1.0	UJ	< 1.0	U	< 1.0	U	< 1.0	U
Xylenes (total)	1330-20-7			µg/L	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U	< 1.0	U

Notes:
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.
NJ: The analyte has been “tentatively identified” or “presumptively” as present and the associated numerical value is the estimated concentration in the sample.
U: Analyte not detected above the laboratory reporting limit
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup): duplicate sample
µg/L micrograms per liter
Bold: Analyte detected above the laboratory reporting limit (detect)
Limit: Limit is USEPA maximum contaminant level (MCL) for bedrock and overburden except 1,1 DCA (ILCR value) for bedrock only.
VISL: Vapor Intrusion Screening Level
Shade: value exceeds limit
value: value exceed VISL

Table 2-6. PFAS - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	MW-S12		MW-S12 (dup)		MW-BS12		MW-S21		MW-BS21		HB-10		GZW-7-1		GZW-7-2		MW-BM03		MW-BM15		MW-BS03		MW-S30	
				Sample Date	11/14/2019		11/14/2019		11/15/2019		11/14/2019		11/15/2019		11/13/2019		11/14/2019		11/18/2019		11/15/2019		11/19/2019		11/15/2019		11/15/2019	
				Formation	Overburden		Overburden		Bedrock		Overburden		Bedrock		Overburden		Overburden		Bedrock		Bedrock		Bedrock		Bedrock		Overburden	
Analyte	Cas No.	Limit	Source	Unit																								
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	763051-92-9	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	U	< 2.20	U	< 1.77	U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	U	< 2.20	U	< 1.77	U
1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)	120226-60-0	--	--	ng/L	< 4.51	U	< 4.51	U	< 4.45	U	< 4.42	U	< 4.56	U	< 4.63	U	< 4.43	U	< 4.75	U	< 4.43	U	< 4.45	U	< 5.51	U	< 4.43	U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	U	< 2.20	U	< 1.77	U
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	1.93	J+	< 1.85	U	< 1.77	U	< 1.90	U	1.3	J	12.6	J+	< 2.20	U	< 1.77	U
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	--	--	ng/L	< 1.80	UJ	< 1.80	UJ	< 1.78	UJ	< 1.77	UJ	< 1.82	UJ	< 1.85	UJ	< 1.77	UJ	< 1.90	UJ	< 1.77	UJ	< 17.8	UJ	< 2.20	UJ	< 1.77	UJ
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	756426-58-1	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	U	< 2.20	U	< 1.77	U
Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	--	--	ng/L		R		R		R	< 44.2	UJ		R	< 46.3	UJ		R	< 47.5	UJ		R		R	< 55.1	UJ		R
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	--	--	ng/L	< 180	UJ	< 180	UJ	< 178	U	< 177	UJ	< 182	U	< 185	U		R	< 19.0	UJ	< 177	U	< 17.8	U	< 220	U	< 177	U
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	--	--	ng/L	< 45.1	U	< 45.1	U	< 44.5	U	< 44.2	U	< 45.6	U	< 46.3	U	< 44.3	U	< 47.5	U	< 44.3	U	< 44.5	U	< 55.1	U	< 44.3	U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	UJ	< 2.20	U	< 1.77	U
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	--	--	ng/L	< 180	UJ	< 180	UJ	< 178	U		R	< 182	U	< 185	UJ		R	< 19.0	UJ	< 177	U	< 17.8	U	< 220	UJ	< 177	U
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	--	--	ng/L	< 45.1	U	< 45.1	U	< 44.5	U	< 44.2	U	< 45.6	U	< 46.3	U	< 44.3	U	< 47.5	U	< 44.3	U	< 44.5	U	< 55.1	U	< 44.3	U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	0.73	J	< 1.77	U	< 1.90	UJ	< 1.77	UJ	0.672	J	< 2.20	U	< 1.77	U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	0.5	J	0.326	J	1.73	J	0.662	J	< 1.77	U	< 1.78	U	< 2.20	U	0.911	J
Perfluorobutanoic Acid (PFBA)	375-22-4	--	--	ng/L	< 1.80	UJ	< 1.80	UJ	< 1.78	UJ	< 1.77	U	0.741	J	1.25	J	1.97	J-	0.544	J	0.943	J		R	0.581	J	1.05	J
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	U	< 2.20	U	< 1.77	U
Perfluorododecane Sulfonic Acid (PFDoDS)	79780-39-5	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	U	< 2.20	U	< 1.77	U
Perfluorododecanoic Acid (PFDoA)	307-55-1	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	UJ	< 2.20	U	< 1.77	U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	U	< 2.20	U	< 1.77	U
Perfluorohexadecanoic Acid (PFHxDA)	67905-19-5	--	--	ng/L	< 3.61	UJ	< 3.61	UJ	< 3.56	UJ	< 3.53	U	< 3.65	UJ	< 3.70	UJ	< 3.55	UJ	< 3.80	UJ	< 3.55	UJ	< 3.56	U	< 4.40	UJ	< 3.55	UJ
Perfluorohexanoic Acid (PFHxA)	307-24-4	--	--	ng/L	< 1.80	UJ	< 1.80	UJ	< 1.78	UJ	< 1.77	U	< 1.82	UJ	< 1.85	U	4.31	J-	< 1.90	U	< 1.77	UJ		R	< 2.20	U	< 1.77	UJ
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	U	< 2.20	U	< 1.77	U
Perfluorooctadecanoic Acid (PFODA)	16517-11-6	--	--	ng/L	< 3.61	UJ	< 3.61	UJ	< 3.56	UJ	< 3.53	U	< 3.65	UJ	< 3.70	UJ	< 3.55	UJ	< 3.80	UJ	< 3.55	UJ	< 3.56	UJ	< 4.40	UJ	< 3.55	UJ
Perfluorooctanesulfonamide (FOSA)	754-91-6	--	--	ng/L	< 1.80	UJ	< 1.80	UJ	< 1.78	UJ	< 1.77	U	< 1.82	UJ	0.9	J	< 1.77	UJ		R	< 1.77	UJ	< 1.78	UJ	< 2.20	UJ	< 1.77	UJ
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	0.325	J	< 1.85	U	< 1.77	U	0.49	J	< 1.77	U	< 1.78	U	< 2.20	U	0.369	J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	--	--	ng/L	< 1.80	UJ	0.437	J	0.537	J	< 1.77	U	1.11	J	0.726	J	5.89	J-	< 1.90	U	< 1.77	UJ		R	< 2.20	U	2.16	J-
Perfluorotetradecanoic Acid (PFTA)	376-06-7	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	U	< 2.20	U	< 1.77	U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	U	< 1.90	U	< 1.77	U	< 1.78	UJ	< 2.20	U	< 1.77	U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	--	--	ng/L	< 1.80	U	< 1.80	U	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	UJ	< 1.90	U	< 1.77	U	< 1.78	UJ	< 2.20	U	< 1.77	U
Perfluorooctanoic Acid (PFOA)	335-67-1	--	--	ng/L	0.361	J	0.383	J	< 1.78	U	0.237	J	< 1.82	U	4.24		4.17	J-	209	J+	4.32			R	5.36		3.87	J-
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	--	--	ng/L	< 1.80	UJ	< 1.80	UJ	< 1.78	UJ	< 1.77	UJ	0.66	J-	6.6	J-	0.464	J	1.02	J	4.35	J-	< 1.78	U	0.89	J-	11.3	J-
Perfluorononanoic Acid (PFNA)	375-95-1	--	--	ng/L	< 1.80	U	< 1.80	UJ	< 1.78	U	< 1.77	U	< 1.82	U	< 1.85	U	< 1.77	UJ	< 1.90	U	< 1.77	U	0.302	J	< 2.20	U	< 1.77	UJ
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	--	--	ng/L	< 1.80	UJ	< 1.80	UJ	< 1.78	UJ	< 1.77	UJ	2.98	J-	0.385	J	0.663	J	1.05	J	0.525	J	< 1.78	UJ	< 2.20	UJ	0.901	J
Perfluoroheptanoic Acid (PFHpA)	375-85-9	--	--	ng/L	< 1.80	UJ	< 1.80	UJ	< 1.78	UJ	< 1.77	U	0.438	J	0.73	J	1.86	J-	1.28	J	0.539	J		R	0.454	J	1.05	J
Perfluorodecanoic Acid (PFDA)	335-76-2	--	--	ng/L	< 1.80	U	< 1.80	UJ	< 1.78	U	< 1.77	U	0.347	J	< 1.85	U	< 1.77	UJ	< 1.90	U	< 1.77	U	< 1.78	UJ	< 2.20	U	< 1.77	UJ
PFAS, Total (MCP 6)	TOTALPFAS6	20	MassDEP	ng/L	0.361		0.383		< 1.78		0.237		4.43		12		7.16		212		9.73		0.302		6.7		17.1	
PFOA or PFOS	PFOA or PFOS	40	USEPA Screening	ng/L	0.361		0.383		< 1.78		0.237		0.66		6.6		4.17		209		4.35		< 1.78		5.36		11.3	
PFOA/PFOS, Total	TOTALPFOAPFOS	70	USEPA PRG	ng/L	0.361		0.383		< 1.78		0.237		0.66		10.8		4.63		210		8.67		< 1.78		6.25		15.2	
PFAS, Total	TPFAS	--	--	ng/L	0.361		0.82		0.537		0.597		9.03		15.9		21.1		214		12		13.6		8.02		21.6	

Table 2-6. PFAS - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site - West Concord, Massachusetts

				Sample Location	MW-S27		MW-S06		GZW-10-2		MW-1		MW-S15		MW-BS15		MW-SD34		MW-BS34		EW-1		ASSABET_MIX		ASSABET-1A		ASSABET-1A (dup		ASSABET-2A	
				Sample Date	11/13/2019		11/14/2019		11/15/2019		11/14/2019		11/15/2019		11/18/2019		11/14/2019		11/15/2019		11/18/2019		11/18/2019		11/18/2019		11/18/2019		11/18/2019	
				Formation	Overburden		Overburden		Bedrock		Overburden		Overburden		Bedrock		Overburden		Bedrock		Overburden									
Analyte	**Cas No.**	**Limit**	**Source**	**Unit**																										
11-Chloroeicosafluoro-3-Oxaundecane-1-Sulfonic Acid	763051-92-9	--	--	ng/L	< 1.84	U	< 1.74	U	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
1H,1H,2H,2H-Perfluorodecanesulfonic Acid (8:2FTS)	39108-34-4	--	--	ng/L	< 1.84	U	< 1.74	U	< 1.92	U	< 1.80	U	< 1.76	UJ	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
1H,1H,2H,2H-Perfluorododecanesulfonic Acid (10:2FTS)	120226-60-0	--	--	ng/L	< 4.61	U	< 4.34	U	< 4.79	U	< 4.51	U	< 4.40	U	< 4.32	U	< 4.27	U	< 4.27	U	< 4.50	U	< 4.43	U	< 4.45	U	< 4.37	U	< 4.50	U
1H,1H,2H,2H-Perfluorohexanesulfonic Acid (4:2FTS)	757124-72-4	--	--	ng/L	< 1.84	U	< 1.74	U	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
1H,1H,2H,2H-Perfluorooctanesulfonic Acid (6:2FTS)	27619-97-2	--	--	ng/L	< 1.84	U	< 1.74	U	**1.33**	J	< 1.80	U	< 1.76	U	**12.4**	J+	< 1.71	U	< 1.71	U	< 1.80	U	**1.48**	J+	< 1.78	UJ	**2.03**	J	< 1.80	U
4,8-Dioxa-3h-Perfluorononanoic Acid (ADONA)	919005-14-4	--	--	ng/L	< 1.84	UJ	< 1.74	UJ	< 1.92	UJ	< 1.80	UJ	< 1.76	UJ	< 1.73	UJ	< 1.71	UJ	< 1.71	UJ	< 1.80	UJ	< 1.77	UJ	< 1.78	UJ	< 1.75	UJ	< 1.80	UJ
9-Chlorohexadecafluoro-3-Oxanone-1-Sulfonic Acid	756426-58-1	--	--	ng/L	< 1.84	U	< 1.74	U	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
Hexafluoropropylene oxide dimer acid (HFPO-DA)	13252-13-6	--	--	ng/L		R		R	< 47.9	UJ		R	< 44.0	UJ	< 43.2	UJ	< 42.7	UJ		R		R	< 44.3	UJ		R	< 43.7	UJ		R
N-Ethyl Perfluorooctane Sulfonamide (NEtFOSA)	4151-50-2	--	--	ng/L	< 184	UJ	< 174	UJ	< 192	U	< 180	U	< 176	U	< 17.3	UJ	< 171	UJ	< 171	U	< 18.0	UJ	< 17.7	UJ	< 17.8	U	< 17.5	U	< 18.0	UJ
N-Ethyl Perfluorooctanesulfonamido Ethanol (NEtFOSE)	1691-99-2	--	--	ng/L	< 46.1	U	< 43.4	U	< 47.9	U	< 45.1	U	< 44.0	U	< 43.2	U	< 42.7	U	< 42.7	U	< 45.0	U	< 44.3	U	< 44.5	U	< 43.7	U	< 45.0	U
N-Ethyl Perfluorooctanesulfonamidoacetic Acid (NEtFOSAA)	2991-50-6	--	--	ng/L	< 1.84	U	< 1.74	UJ	**1.28**	J	**1.51**	J	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
N-Methyl Perfluorooctane Sulfonamide (NMeFOSA)	31506-32-8	--	--	ng/L	< 184	UJ	< 174	UJ	< 192	U	< 180	U	< 176	U	< 17.3	UJ	< 171	UJ	< 171	U	< 18.0	UJ	< 17.7	UJ	< 17.8	U	< 17.5	U	< 18.0	UJ
N-Methyl Perfluorooctanesulfonamido Ethanol (NMeFOSE)	24448-09-7	--	--	ng/L	< 46.1	U	< 43.4	U	< 47.9	U	< 45.1	U	< 44.0	U	< 43.2	U	< 42.7	U	< 42.7	U	< 45.0	U	< 44.3	U	< 44.5	U	< 43.7	U	< 45.0	U
N-Methyl Perfluorooctanesulfonamidoacetic Acid (NMeFOSAA)	2355-31-9	--	--	ng/L	< 1.84	U	< 1.74	UJ	< 1.92	U	**1.56**	J	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
Perfluorobutanesulfonic Acid (PFBS)	375-73-5	--	--	ng/L	**1.04**	J	**0.694**	J	**0.433**	J	**1.06**	J	**6.13**		**0.516**	J	**0.348**	J	< 1.71	U	**0.762**	J	**3.86**		**5.01**		**4.58**		**2.16**	
Perfluorobutanoic Acid (PFBA)	375-22-4	--	--	ng/L	**2.14**	J-	**1.61**	J	**0.402**	J	**2.64**	J-	**27.6**		**0.578**	J	**0.713**	J	< 1.71	UJ	**1.32**	J	**5.02**		**6.66**	J-	**6.53**		**2.31**	J-
Perfluorodecanesulfonic Acid (PFDS)	335-77-3	--	--	ng/L	< 1.84	U	< 1.74	U	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
Perfluorododecane Sulfonic Acid (PFDoDS)	79780-39-5	--	--	ng/L	< 1.84	U	< 1.74	U	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
Perfluorododecanoic Acid (PFDoA)	307-55-1	--	--	ng/L	< 1.84	U	< 1.74	UJ	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
Perfluoroheptanesulfonic Acid (PFHpS)	375-92-8	--	--	ng/L	< 1.84	U	< 1.74	U	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
Perfluorohexadecanoic Acid (PFHxDA)	67905-19-5	--	--	ng/L	< 3.69	UJ	< 3.47	UJ	< 3.83	UJ	< 3.61	UJ	< 3.52	UJ	< 3.46	U	< 3.41	UJ	< 3.41	UJ	< 3.60	UJ	< 3.55	U	< 3.56	UJ	< 3.50	U	< 3.60	U
Perfluorohexanoic Acid (PFHxA)	307-24-4	--	--	ng/L	< 1.84	UJ	< 1.74	UJ	< 1.92	U	**5.73**	J-	**33**		< 1.73	U	< 1.71	U	< 1.71	UJ	< 1.80	UJ	**10.4**		**14.5**	J-	**14.7**		< 1.80	UJ
Perfluorononanesulfonic Acid (PFNS)	68259-12-1	--	--	ng/L	< 1.84	U	< 1.74	U	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
Perfluorooctadecanoic Acid (PFODA)	16517-11-6	--	--	ng/L	< 3.69	UJ	< 3.47	UJ	< 3.83	UJ	< 3.61	UJ	< 3.52	UJ	< 3.46	U	< 3.41	UJ	< 3.41	UJ	< 3.60	UJ	< 3.55	U	< 3.56	UJ	< 3.50	U	< 3.60	U
Perfluorooctanesulfonamide (FOSA)	754-91-6	--	--	ng/L	< 1.84	UJ	< 1.74	UJ	< 1.92	UJ	< 1.80	UJ		R	< 1.73	UJ	< 1.71	UJ	< 1.71	UJ	< 1.80	UJ	< 1.77	UJ	< 1.78	UJ	< 1.75	U	< 1.80	UJ
Perfluoropentanesulfonic Acid (PFPeS)	2706-91-4	--	--	ng/L	< 1.84	U	**0.281**	J	**0.64**	J	**0.44**	J	**1.97**		**0.502**	J	**0.249**	J	< 1.71	U	**0.227**	J	**0.454**	J	**0.584**	J	**0.563**	J	**0.356**	J
Perfluoropentanoic Acid (PFPeA)	2706-90-3	--	--	ng/L	**3.64**	J-	**2.69**	J-	**0.935**	J	**6.31**	J-	**49.3**		< 1.73	U	**0.604**	J	**0.816**	J	< 1.80	UJ	**14.5**		**21**		**20.9**		**3.06**	J-
Perfluorotetradecanoic Acid (PFTA)	376-06-7	--	--	ng/L	< 1.84	U	< 1.74	UJ	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
Perfluorotridecanoic Acid (PFTrDA)	72629-94-8	--	--	ng/L	< 1.84	U	< 1.74	UJ	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	U	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
Perfluoroundecanoic Acid (PFUnA)	2058-94-8	--	--	ng/L	< 1.84	UJ	< 1.74	UJ	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	UJ	< 1.77	U	< 1.78	U	< 1.75	U	< 1.80	U
Perfluorooctanoic Acid (PFOA)	335-67-1	--	--	ng/L	**4.15**	J-	**7.2**	J-	< 1.92	U	**6.58**	J-	**5.04**		< 1.73	U	**5.95**		< 1.71	UJ	< 1.80	UJ	**9.05**	J+	**11.9**	J+	**11.5**	J+	< 1.80	UJ
Perfluorooctanesulfonic Acid (PFOS)	1763-23-1	--	--	ng/L	**5.37**	J-	**15.1**	J-	**0.966**	J	**7.2**	J-	**2.58**		**6.71**	J	**8.03**	J-	**0.59**	J	**3.02**	J	**7.74**	J	**9.51**	J	**11.1**	J	**2.97**	J
Perfluorononanoic Acid (PFNA)	375-95-1	--	--	ng/L	< 1.84	UJ	< 1.74	UJ	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	UJ	**0.486**	J	**4.23**		**5.49**		**5.65**		**0.324**	J
Perfluorohexanesulfonic Acid (PFHxS)	355-46-4	--	--	ng/L	**0.849**	J	**1.06**	J	**0.912**	J	**1.54**	J	**4.02**	J-	**1.24**	J	**0.877**	J	< 1.71	UJ	**0.831**	J	**3.39**		**3.52**		**3.71**	J+	**2.52**	
Perfluoroheptanoic Acid (PFHpA)	375-85-9	--	--	ng/L	**1.21**	J	**1.53**	J	**0.284**	J	**2.4**	J-	**5.38**		**0.495**	J	**0.601**	J	< 1.71	UJ	**0.712**	J	**3.13**		**3.66**	J-	**3.82**		**2.37**	J-
Perfluorodecanoic Acid (PFDA)	335-76-2	--	--	ng/L	**0.332**	J	**0.337**	J	< 1.92	U	< 1.80	U	< 1.76	U	< 1.73	U	< 1.71	U	< 1.71	U	< 1.80	UJ	**0.457**	J	**0.651**	J	**0.682**	J	< 1.80	U
PFAS, Total (MCP 6)	TOTALPFAS6	20	MassDEP	ng/L	**11.9**		**25.2**		**2.16**		**17.7**		**17**		**8.44**		**15.46**		**0.59**		**5.05**		**27.5**		**34.7**		**36.5**		**8.18**	
PFOA or PFOS	PFOA or PFOS	40	USEPA Screening	ng/L	**5.37**		**15.1**		**0.966**		**7.2**		**5.04**		**6.71**		**8.03**		**0.59**		**3.02**		**9.1**		**11.9**		**11.5**		**2.97**	
PFOA/PFOS, Total	TOTALPFOAPFOS	70	USEPA PRG	ng/L	**9.52**		**22.3**		**0.966**		**13.8**		**7.62**		**6.71**		**14**		**0.59**		**3.02**		**16.8**		**21.4**		**22.6**		**2.97**	
PFAS, Total	TPFAS	--	--	ng/L	**18.7**		**30.5**		**7.18**		**36.9**		**135**		**22.4**		**17.4**		**1.41**		**7.36**		**63.7**		**82.5**		**85.8**		**16.1**	

Notes:

U: Analyte not detected above the laboratory reporting limit.

Background

J: Analyte is estimated.

UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.

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.

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.

(dup): duplicate sample

ng/L: nanograms per liter

PFAS: per- and polyfluoroalkyl substances

Bold: Analyte detected above the laboratory reporting limit (detect).

Red: Highest detected concentration

PFAS, Total (6): Summation of results for: PFDA, PFHpA, PFHxS, PFOA, PFNA and PFOS

Shaded: Value exceeds Comparison Limit

Table 2-7. Nitrate-Nitrite - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site, West Concord, Massachusetts

			Sample Location	**ASSABET-1A**		**ASSABET-1A (dup**		**ASSABET-2A**		**GZW-7-2**		**GZW-8-2**		**GZW-10-2**		**GZW-11-2**		**ML-3-3**		**MW-BM03**	
			Sample Date	**11/18/2019**		**11/18/2019**		**11/18/2019**		**11/18/2019**		**11/19/2019**		**11/15/2019**		**11/14/2019**		**11/19/2019**		**11/15/2019**	
			Formation							**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	**0.031**	J	**0.027**	J	**0.034**	J	**2.7**		< 0.050	U	**0.25**		< 0.050	UJ	< 0.050	U	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	**0.89**		**0.88**		**1.9**		**63**		**1.3**		**1**		**0.16**		< 0.10	U	< 0.10	U

			Sample Location	MW-BM15		MW-BS01		MW-BS02		MW-BS03		MW-BS04		MW-BS10		MW-BS12		MW-BS13		MW-BS14	
			Sample Date	11/19/2019		11/12/2019		11/12/2019		11/15/2019		11/13/2019		11/14/2019		11/15/2019		11/13/2019		11/13/2019	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	**0.04**	J	**0.13**		< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	UJ	< 0.050	UJ	< 0.050	U	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	< 0.10	U	**0.75**		< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U

			Sample Location	MW-BS15		MW-BS17		MW-BS21		MW-BS22		MW-BS25		MW-BS25 (dup)		MW-BS26		MW-BS28		MW-BS31	
			Sample Date	11/18/2019		11/11/2019		11/15/2019		11/13/2019		11/15/2019		11/15/2019		11/19/2019		11/15/2019		11/15/2019	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	**0.052**	J-	**0.02**	J-	< 0.050	UJ	< 0.050	U	**0.14**		**0.13**		**0.042**	J	< 0.050	UJ	< 0.050	UJ
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	**3**		**0.051**	J	< 0.11	U	**3.5**		< 0.16	U	< 0.16	U	< 0.10	U	< 0.10	U	< 0.10	U

			Sample Location	MW-BS32		MW-BS34		MW-BS35		MW-BS36		MW-BS37		MW-BS38		MW-BS39		MW-BS40		MW-BS46	
			Sample Date	11/12/2019		11/15/2019		11/12/2019		11/15/2019		11/15/2019		11/12/2019		11/13/2019		11/11/2019		11/18/2019	
			Formation	Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock		Bedrock	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U	**0.045**	J-	**0.022**	J
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	< 0.10	U	< 0.10	U	< 0.10	U	**0.037**	J	< 0.10	U	< 0.10	U	< 0.10	U	**0.046**	J	< 0.10	U

Table 2-7. Nitrate-Nitrite - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site, West Concord, Massachusetts

			Sample Location	**MW-S27**		**SW-2A**		**EW-1**		**GZW-7-1**		**GZW-7S**		**GZW-8-1**		**GZW-9-1**		**GZW-9-2**		**HA-09**	
			Sample Date	**11/13/2019**		**11/14/2019**		**11/18/2019**		**11/14/2019**		**11/13/2019**		**11/11/2019**		**11/12/2019**		**11/14/2019**		**11/13/2019**	
			Formation	**Bedrock**		**Bedrock**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	**0.016**	J	< 0.050	UJ	**0.028**	J	< 0.050	UJ	< 0.050	U	**0.017**	J-	< 0.050	U	< 0.050	UJ	**0.016**	J
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	**2.6**		< 0.10	U	< 0.10	U	**1.8**		**2.2**		**1.9**		**5.7**		**0.034**	J	< 0.10	U

			Sample Location	HA-11		HB-10		HB-10S		HB-11		HB-12		HB-620		HB-620 (dup)		HBPZ-2R		ML-1-1	
			Sample Date	11/13/2019		11/13/2019		11/12/2019		11/12/2019		11/11/2019		11/11/2019		11/11/2019		11/11/2019		11/13/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	< 0.050	U	**0.019**	J	< 0.050	U	< 0.050	U	**0.02**	J-	**0.021**	J-	**0.016**	J-	**0.027**	J-	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	< 0.10	U	**0.24**		< 0.10	U	< 0.10	U	**2.6**		**2.9**		**2.9**		**4.7**		**1.2**	

			Sample Location	ML-1-2		ML-3-1		MW-1		MW-1 (dup)		MW-2		MW-8A		MW-S01		MW-SD01		MW-S02	
			Sample Date	11/18/2019		11/19/2019		11/14/2019		11/14/2019		11/11/2019		11/13/2019		11/15/2019		11/14/2019		11/14/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	**0.023**	J	**0.048**	J	**0.021**	J-	**0.019**	J-	**0.019**	J-	< 0.050	U	< 0.050	UJ	< 0.050	UJ	< 0.050	UJ
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	**2.9**		**0.31**		**1.7**		**1.8**		**0.36**		**2.5**		**3.8**		**2.9**		**3**	

			Sample Location	MW-S02 (dup)		MW-SD02		MW-S03		MW-S04		MW-S06		MW-SD06		MW-S07		MW-S08		MW-S09	
			Sample Date	11/14/2019		11/12/2019		11/12/2019		11/13/2019		11/14/2019		11/14/2019		11/11/2019		11/13/2019		11/12/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	**0.017**	J-	< 0.050	U	< 0.050	U	< 0.050	U	**0.019**	J-	< 0.050	UJ	**0.015**	J-	< 0.050	U	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	**3**		**2.1**		**6.3**		< 0.20	U	**3**		**2.9**		**3**		**0.34**		**1.7**	

Table 2-7. Nitrate-Nitrite - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site, West Concord, Massachusetts

			Sample Location	**MW-S09 (dup)**		**MW-SD10**		**MW-S11**		**MW-S12**		**MW-S12 (dup)**		**MW-SD13**		**MW-S14**		**MW-S15**		**MW-S16**	
			Sample Date	**11/12/2019**		**11/12/2019**		**11/13/2019**		**11/14/2019**		**11/14/2019**		**11/12/2019**		**11/12/2019**		**11/15/2019**		**11/12/2019**	
			Formation	**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	UJ	< 0.050	UJ	< 0.050	U	< 0.050	U	< 0.050	U	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	**1.7**		**0.5**		< 0.10	U	**0.13**		**0.13**		**2.6**		**0.93**		**0.16**		**1.8**	

			Sample Location	MW-S16 (dup)		MW-S17		MW-SD17		MW-S18		MW-S19		MW-S20		MW-S21		MW-S22		MW-S23	
			Sample Date	11/12/2019		11/12/2019		11/12/2019		11/11/2019		11/11/2019		11/12/2019		11/14/2019		11/13/2019		11/13/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	< 0.050	U	< 0.050	U	< 0.050	U	**0.027**	J-	< 0.050	UJ	< 0.050	U	< 0.050	UJ	< 0.050	U	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	**1.8**		**2.3**		**1.7**		**0.046**	J	**0.046**	J	< 0.10	U	**0.042**	J	**0.57**		**0.74**	

			Sample Location	MW-S24		MW-S26		MW-SD26		MW-SD27		MW-S28		MW-S29		MW-SD29		MW-S30		MW-SD30	
			Sample Date	11/13/2019		11/15/2019		11/18/2019		11/12/2019		11/14/2019		11/13/2019		11/14/2019		11/15/2019		11/12/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	< 0.050	U	< 0.050	U	**0.02**	J	< 0.050	U	**0.018**	J-	< 0.050	U	< 0.050	UJ	< 0.050	UJ	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	**4.2**		**0.89**		**3.2**		**2.3**		**0.049**	J	**0.54**		**2.2**		**3.1**		**2.3**	

			Sample Location	MW-S32		MW-SD32		MW-SD34		MW-S35		MW-SD35		MW-S36		MW-SD36		MW-SD36 (dup)		MW-S37	
			Sample Date	11/13/2019		11/15/2019		11/14/2019		11/12/2019		11/13/2019		11/11/2019		11/18/2019		11/18/2019		11/13/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	**0.02**	J	< 0.050	U	< 0.050	UJ	< 0.050	U	< 0.050	U	**0.026**	J-	**0.024**	J	**0.016**	J	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	**1**		**0.46**		< 0.10	U	**6.2**		< 0.11	U	**0.14**		< 0.10	U	< 0.10	U	< 0.10	U

Table 2-7. Nitrate-Nitrite - Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site, West Concord, Massachusetts

			Sample Location	**MW-SD37**		**MW-S38**		**MW-SD38**		**MW-S39**		**MW-SD39**		**MW-S40**		**MW-SD40**		**MW-SD40 (dup)**		**MW-SD41**	
			Sample Date	**11/18/2019**		**11/13/2019**		**11/15/2019**		**11/14/2019**		**11/15/2019**		**11/14/2019**		**11/14/2019**		**11/14/2019**		**11/15/2019**	
			Formation	**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	**0.029**	J	**0.015**	J	< 0.050	U	< 0.050	UJ	< 0.050	UJ	< 0.050	UJ	**0.017**	J-	< 0.050	UJ	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	< 0.10	U	< 0.10	U	< 0.10	U	**0.33**		< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**0.035**	J

			Sample Location	MW-SD41 (dup)		MW-SD42A		MW-SD43		MW-SD44		MW-SD45		MW-SD46		MW-SD46 (dup)		MW-SM13		MW-SM46	
			Sample Date	11/15/2019		11/15/2019		11/15/2019		11/15/2019		11/14/2019		11/18/2019		11/18/2019		11/11/2019		11/15/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	< 0.050	U	< 0.050	U	< 0.050	UJ	< 0.050	UJ	< 0.050	UJ	**0.03**	J-	< 0.050	UJ	**0.022**	J-	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	< 0.10	U	**2.6**		**0.06**	J

			Sample Location	MW-T10		MW-T24		OW-2		OW-3		P-1		P-1A		P-2		P-3		P-4	
			Sample Date	11/14/2019		11/13/2019		11/11/2019		11/13/2019		11/18/2019		11/15/2019		11/15/2019		11/15/2019		11/13/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**MCL**	**Unit**																		
Nitrite as N	14797-65-0_N	1	mg/l	< 0.050	UJ	**0.76**		**0.025**	J-	< 0.050	U	**0.018**	J	**0.12**		< 0.050	U	< 0.050	U	< 0.050	U
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	< 0.10	U	**150**		**4.7**		**0.95**		**2.4**		**2.1**		**2.1**		**1.9**		**2.3**	

			Sample Location	PT-09		PT-11P		PW-6		PW-6 (dup)		SW-1	
			Sample Date	11/18/2019		11/13/2019		11/13/2019		11/13/2019		11/14/2019	
			Formation	Overburden		Overburden		Overburden		Overburden		Overburden	
Analyte	**Cas No.**	**MCL**	**Unit**										
Nitrite as N	14797-65-0_N	1	mg/l	**0.025**	J-	< 0.050	U	< 0.050	U	< 0.050	U	**0.034**	J
Nitrogen, Nitrate as N	14797-55-8_N	10	mg/l	< 0.10	U	**1**		**2.3**		**2.3**		**2.5**	

Notes:
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.
U: The analyte was analyzed for but was not detected above the level of the reported sample quantitation limit.
UJ: The analyte was analyzed for but was not detected. The reported quantitation limit is approximate and may be inaccurate or imprecise.
(dup): duplicate sample
mg/L: milligrams per liter
MCL: USEPA maximum contaminant levels
Shaded: Value exceeds MCL
Bold: Analyte detected above the laboratory reporting limit (detect)

Table 2-8. Geochemical Parameters – Sitewide Groundwater Sampling Results - November 2019
Nuclear Metals, Inc. Superfund Site, West Concord, Massachusetts

		Sample Location	**GZW-7-2**		**GZW-10-2**		**MW-BS02**		**MW-BS03**		**MW-BS10**		**MW-BS12**		**MW-BS21**		**MW-BS28**		**GZW-7-1**		**GZW-7S**		**HB-12**	
		Sample Date	**11/18/2019**		**11/15/2019**		**11/12/2019**		**11/15/2019**		**11/14/2019**		**11/15/2019**		**11/15/2019**		**11/15/2019**		**11/14/2019**		**11/13/2019**		**11/11/2019**	
		Formation	**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Bedrock**		**Overburden**		**Overburden**		**Overburden**	
Analyte	**Cas No.**	**Unit**																						
Chloride	16887-00-6	mg/L	**32.6**		**12.6**		**22.1**		**7.26**		**6.13**		**4.56**		**66.6**		**41.4**		**56.3**		**53.8**		**35**	
Fluoride	16984-48-8	mg/L	**0.404**		**0.08**	J	**0.237**		**0.063**	J	**0.272**		**0.272**		**0.084**	J	**0.051**	J	**0.039**	J	**0.049**	J	< 0.050	U
Sulfate as SO4	14808-79-8	mg/L	**164**		**322**		**35.5**		**61.7**		**15.5**	J-	**16.9**		**39.1**		**315**		**12.8**	J-	**3.91**	J-	**23.1**	
Alkalinity, Bicarbonate as CaCO3	ALK_BICARB	mg/L	**104**		**142**		**158**	J	**222**		**68.5**	J	< 2.00	U	**76.1**		**214**		**21.8**	J	**17.8**		**27.1**	
Carbonate (as CO3)	3812-32-6	mg/L	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	**67.9**		< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Phosphorus, Orthophosphate	ORTH_PHOS	mg/L	**0.31**		**0.001**	J	**0.194**	J	< 0.005	UJ	**0.009**	J	**0.022**	J	**0.001**	J	< 0.005	UJ	<0.005	UJ	< 0.010	U	< 0.005	U
Phosphorus, Total	7723-14-0	mg/L	**0.149**		**0.014**		**0.084**	J	**0.181**		<0.026	U	**0.046**		**0.035**		**0.005**	J	<0.010	U	<0.011	U	<0.010	U
Dissolved Organic Carbon	DOC	mg/L	< 1.6	UJ	**1.6**	J	**5.8**	J	**1.2**	J	< 1.0	U	**0.92**	J	**0.69**	J	**1.4**	J	< 1.0	U	**0.85**	J	**0.73**	J

		Sample Location	**HBPZ-2R**		**MW-8A**		**MW-S01**		**MW-S02**		**MW-S02 (dup)**		**MW-S16**		**MW-S16 (dup)**		**MW-S21**		**MW-S24**		**MW-SD01**		**MW-SD02**	
		Sample Date	**11/11/2019**		**11/13/2019**		**11/15/2019**		**11/14/2019**		**11/14/2019**		**11/12/2019**		**11/12/2019**		**11/14/2019**		**11/13/2019**		**11/14/2019**		**11/12/2019**	
		Formation	**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**		**Overburden**	
Analyte	**Cas No.**	**Unit**																						
Chloride	16887-00-6	mg/L	**31**		**48.5**		**76.5**		**21.5**		**21.6**		**53.3**		**54**		**11**		**36.2**		**28.9**		**73.4**	
Fluoride	16984-48-8	mg/L	**0.069**		< 0.050	UJ	**0.159**	J	**0.038**	J	**0.038**	J	< 0.050	U	< 0.050	U	< 0.050	UJ	< 0.050	UJ	**0.045**	J	< 0.050	U
Sulfate as SO4	14808-79-8	mg/L	**17**		**12.8**	J-	**13.9**		**22.5**	J-	**22.8**	J-	**15.4**		**15**		**5.08**	J-	**46.2**	J-	**26**	J-	**15.5**	
Alkalinity, Bicarbonate as CaCO3	ALK_BICARB	mg/L	**23.6**		**17.4**		**42.4**		**14.1**	J	**24.9**	J	**20.2**	J	**11.8**	J	**8.8**	J	**29.1**		**23.6**	J	**20**	J
Carbonate (as CO3)	3812-32-6	mg/L	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U	< 2.00	U
Phosphorus, Orthophosphate	ORTH_PHOS	mg/L	< 0.005	U	< 0.011	U	**0.015**	J	**0.014**	J	**0.014**	J	< 0.015	UJ	**0.021**	J	**0.007**	J	< 0.005	U	**0.009**	J	**0.038**	J
Phosphorus, Total	7723-14-0	mg/L	<0.010	U	<0.022	U	**0.022**		<0.022	U	<0.022	U	**0.024**		**0.025**		<0.015	U	**0.042**		<0.020	U	**0.143**	
Dissolved Organic Carbon	DOC	mg/L	**1.3**	J	**0.57**	J	**0.58**	J	< 2.0	U	< 1.0	U	**0.6**	J	**0.66**	J	< 1.0	U	**1**		< 1.0	U	**0.92**	J

Notes:
U: Analyte not detected above the laboratory reporting limit.
J: Analyte is estimated.
J-: Analyte is estimated, biased low
(dup): duplicate sample
mg/L: milligrams per liter
Bold: Analyte detected above laboratory reporting limit (detect)

Table 3-1. Proposed Bedrock Extraction and Monitoring Wells
Nuclear Metals Superfund Site Concord, Massachusetts

Proposed Open Borehole Bedrock Extraction Wells

Location	Purpose	Estimated Ground Surface Elevation (ft amsl)	Ground Surface Elevation Source	Summary of Proposed Drilling and Well Construction	Nearest Bedrock Well	Uranium Concentration November 2019 (µg/L)	1,4-Dioxane Concentration November 2019 (µg/L)	Nearest Well Depth to Bedrock (ft)	Nearest Well Depth to Bottom of Screen (ft)	Nearest Well Screen Bottom Depth Distance Below Top of Bedrock (ft)	Proposed Length of Well in Bedrock (ft)	Proposed Total Well Depth (ft)	Well Location Rationale
BEW-1	U/1,4-D Removal	191.9	MW-8A	OB - Dual Rotary - 6-inch casing BR - Air Rotary - 6-inch open borehole	GZW-7-2	47.2	34.7	100	113	13	73	173	- Evaluate vertical distribution of uranium and 1,4-dioxane near the Holding Basin. - Evaluate bedrock fracture connectivity and zone of influence in the eastern portion of the plume. - Extraction location for uranium rebound testing at the upgradient edge of the 50 µg/L contour.
BEW-2	U/1,4-D Removal	191.4	MW-BM03		MW-BM03	45.3	16.5	124	167	43	103	227	- Evaluate vertical distribution of uranium and 1,4-dioxane in the core of the plume. - Evaluate bedrock fracture connectivity and zone of influence in the core of the plume. - Extraction location for uranium rebound testing in the area of highest historical concentrations.
BEW-3	U/1,4-D Removal	181.5	Average of GZW-10-2/MW-BS13		GZW-10-2	71.1	55.4	139	152	13	73	212	- Evaluate vertical distribution of uranium and 1,4-dioxane near the highest November 2019 detections. - Evaluate fracture connectivity and zone of influence in the western portion of the 50 µg/L contour. - Extraction location for uranium rebound testing in the western portion of the 50 µg/L contour.

Proposed Shallow Bedrock Monitoring Well

Location	Purpose	Estimated Ground Surface Elevation (ft amsl)	Ground Surface Elevation Source	Summary of Drilling and Well Construction	Nearest Bedrock Well	Uranium Concentration November 2019 (µg/L)	1,4-Dioxane Concentration November 2019 (µg/L)	Nearest Well Depth to Bedrock (ft)	Nearest Well Depth to Bottom of Screen (ft)	Nearest Well Screen Bottom Depth Distance Below Top of Bedrock (ft)	Proposed Length of Well in Bedrock (ft)	Proposed Total Well Depth (ft)	Well Location Rationale
MW-BS7-2	GZW-7-2 replacement	192.2	GZW-7-2	OB - Sonic - 2-inch PVC grouted in 7-inch borehole BR - HQ (3.8-inch) or PQ (4.8-inch) Wireline Coring - 2-inch PVC Screen	GZW-7-2	47.2	34.7	100	113	13	20	120	- Replace a GZW-7-2 BarCad Sampler (111.5-113 ft bgs) with a 2-inch monitoring well for water quality and water level monitoring - Co-sampling GZW-7-2/MW-BS7-2 will be conducted to evaluate if the results are comparable before the sampling at GZW-7-2 is discontinued.

Notes
1. Ground surface and top of bedrock elevations are inferred from the nearest existing wells with the available information.
2. The target well depths were selected at 60 feet beneath the bottom of the screen of the nearest well exceeding the uranium MCL.
1,4-D: 1,4-dioxane
µg/L: micrograms per liter
amsl: above mean sea level
BR: bedrock
ft: feet
MCL: maximum contaminant level
OB: overburden
PVC: polyvinyl chloride
U: uranium with natural isotopic signature

Table 3-2. Drilling and Rebound Testing Hydraulic Monitoring Plan
Nuclear Metals Superfund Site, Concord, Massachusetts

Monitoring Locations	BEW-1	BEW-2	BEW-3
Bedrock Monitoring Wells			
MW-BS01		T/M	T/M
MW-BS02	T/M	T/M	T/M
MW-BS03	T/M	T/M	T/M
MW-BS04	T/M	T/M	
MW-BS10	T/M	T/M	
MW-BS12	T/M		
MW-BS13		T/M	T/M
MW-BS14			T/M
MW-BS17	T/M	T/M	
MW-BS21	T/M		
MW-BS22 (Ambient)	T/M	T/M	T/M
MW-BS28			T/M
MW-BS54			T/M
MW-BS7-2	T/M	T/M	
GZW-10-2		T/M	T/M
Overburden Monitoring Wells			
GZW-10-1	M	M	M
GZW-7-1	M	M	M
MW-11	M	M	M
MW-SD02	T/M	T/M	T/M
MW-SD06	M	M	M
MW-S03	M	M	M
MW-SD13	T/M	T/M	T/M
MW-SD01	M	M	M
Pressure Transducer Locations	11	12	11

Note:
1. Baseline depth to water measurements will be collected at all presented monitoring wells prior to initiation of pumping at each extraction well.
3. Monitoring locations for the extraction testing may be revised based on aquifer response observed during drilling activities.
M: manual water level monitoring locations
T/M: pressure transducer and manual monitoring locations

Table 3-3. Rebound Testing Water Quality Monitoring Plan
Nuclear Metals Superfund Site Concord, Massachusetts

Pumping Monitoring Schedule	Field Parameters	BEW-1 Analytes	BEW-2 Analytes	BEW-3 Analytes
		Uranium 1,4-dioxane Arsenic Iron Manganese Cobalt Thorium	**Uranium 1,4-dioxane Arsenic Iron Manganese Cobalt Thorium**	**Uranium 1,4-dioxane Arsenic Iron Manganese**
Pumping				
Startup (baseline)	X	X	X	X
12-Hour (0.5 days)	every 6 hr	X	X	X
24-Hour (1 day)	every 6 hr	X	X	X
48-Hour (2 days)	every 6 hr	X	X	X
72-Hour (3 days)	every 6 hr	X	X	X
96-Hour (4 days)	every 6 hr	X	X	X
120-Hour (5 days)	every 6 hr	X	X	X
168-Hour (7 days)	every 6 hr	X	X	X
Every 48 hours (After 7 Days)	every 6 hr	X	X	X
Prior to Shutdown	X	X	X	X
Recovery				
Day 1	X	X	X	X
Day 2	X	X	X	X
Day 21	X	X	X	X
Duplicates	N/A	1	1	1
Trip Blanks	N/A	N/A	N/A	N/A
Equipment Blanks	N/A	0	0	1
MS/MSD	N/A	1	1	0

Notes:
1. Field parameters will be recorded at the beginning of pumping and include specific conductance, pH, oxidation reduction potential, temperature, dissolved oxygen, and turbidity.
2. The QAPP indicates that Duplicates and equipment blanks should be collected for 5% of samples, and that, Matrix Spike/Matrix Spike Duplicate (MS/MSD) should be taken at 5% of samples per matrix per parameter. As grab samples, no equipment blanks will be collected.
3. The method detection limit for 1,4-Dioxane analysis must be below 0.3 micrograms per liter (µg/L).

Table 4-1. DPT Jet Injection Plan for Solid Reagent - ISS Pilot Test Area 1
Nuclear Metals Superfund Site Concord, Massachusetts

Location ID	Top of Treatment Interval (ft bgs)	Bottom of Treatment Interval (ft bgs)	Treatment Interval Thickness (ft)	Injection Spacing (ft)	Number of Injection Depths
IP-1-1	50.0	80.0	30.0	3	11
IP-1-2	51.5	78.5	27.0	3	10
IP-1-3	50.0	80.0	30.0	3	11
TOTALS					**32**

Notes:

1. ft: feet; bgs :below ground surface
2. Quantities of ISS reagents and other slurry components for each discrete injection depth will be selected based on the results of TS ISS-2.

Table 4-2. Injection Plan for Soluble Reagent - ISS Pilot Test Area 2
Nuclear Metals Superfund Site Concord, Massachusetts

Location ID	Top of Treatment Interval (ft bgs)	Bottom of Treatment Interval (ft bgs)	Treatment Interval Thickness (ft)	Target ROI (ft)	Minimum Injectate Volume (gal)		Maximum Injectate Volume (gal)	
					Volume per Linear Foot	Volume per Location	Volume per Linear Foot	Volume per Location
IP-2-1	57.0	87.0	30.0	10	106	3,180	211	6,330
IP-2-2	57.0	87.0	30.0	15	238	7,140	476	14,280
IP-2-3	57.0	87.0	30.0	20	423	12,690	846	25,380
TOTALS						**23,010**		**45,990**

Notes:

1. ft = feet; bgs = below ground surface; gal = gallons; ROI = radius of influence
2. The minimum injectate volume is calculated as 15% of the pore volume within the target ROI, and the maximum injectate volume is calculated as 30% of the pore volume within the target ROI.
3. The concentration of ISS reagents in the injectate will be selected based on the results of TS ISS-2.

Table 4-3. Baseline and Performance Monitoring Groundwater Sampling Plan - ISS Pilot Test
Nuclear Metals Superfund Site, Concord, Massachusetts

Monitoring Well ID	Well Status	Geologic Unit	Location	Screened Interval (ft bgs)	Baseline Monitoring					Post-Injection Performance Monitoring				
					Total Metals (Fe, Ca, U)	Dissolved Metals (Fe, Ca, U)	Total Phosphorus	Fluorescent Tracer Dyes[1]	Field Geochemical Parameters[2]	Total Metals (Fe, Ca, U)	Dissolved Metals (Fe, Ca, U)	Total Phosphorus	Fluorescent Tracer Dyes[1]	Field Geochemical Parameters[2]
ISS Pilot Test Area 1														
HBPZ-2R	Existing	Upper Stratified Drift	Upgradient	36-51	x	x	x		x	x	x	x		x
MW-S24	Existing	Upper Stratified Drift	Within Pilot Test Area	53.8-63.8	x	x	x		x	x	x	x		x
MW-SD24	Proposed	Lower Stratified Drift	Within Pilot Test Area	65-80[3]	x	x	x		x	x	x	x		x
MW-S60	Proposed	Upper Stratified Drift	Downgradient	50-65[3]	x	x	x		x	x	x	x		x
MW-SD60	Proposed	Lower Stratified Drift	Downgradient	65-80[3]	x	x	x		x	x	x	x		x
ISS Pilot Test Area 2														
MW-S02	Existing	Upper Stratified Drift	Downgradient	57-67	x	x	x	x	x	x	x	x	x	x
MW-S16	Existing	Lower Stratified Drift	Upgradient	68.8-78.8	x	x	x		x	x	x	x		x
MW-SD61	Proposed	Lower Stratified Drift	Downgradient	72-87[3]	x	x	x	x	x	x	x	x	x	x
MW-S62	Proposed	Upper Stratified Drift	Within Pilot Test Area	57-72[3]	x	x	x	x	x	x	x	x	x	x
MW-SD62	Proposed	Lower Stratified Drift	Within Pilot Test Area	77-87[3]	x	x	x	x	x	x	x	x	x	x
MW-S63	Proposed	Upper Stratified Drift	Within Pilot Test Area	57-72[3]	x	x	x	x	x	x	x	x	x	x
MW-SD63	Proposed	Lower Stratified Drift	Within Pilot Test Area	77-87[3]	x	x	x	x	x	x	x	x	x	x
MW-S64	Proposed	Upper Stratified Drift	Downgradient	60-75[3]	x	x	x	x	x	x	x	x	x	x
MW-SD64	Proposed	Lower Stratified Drift	Downgradient	85-95[3]	x	x	x	x	x	x	x	x	x	x
MW-8A	Existing	Upper Stratified Drift	Downgradient	60-70	x	x	x	x	x	x	x	x	x	x

Notes:
1. Fluorescent tracer dye analysis will be performed for the dyes injected in ISS Pilot Test Area 2 and is expected to include rhodamine WT, fluorescein, and eosine.
2. Field geochemical parameters include temperature, pH, specific conductance, dissolved oxygen, and oxidation reduction potential.
3. Screened intervals for proposed wells are approximate and will be selected in the field based on soil borings to be performed at the locations of the new wells.
4. Post-injection performance monitoring samples will be collected at 1 month, 2 months, and 4 months after completing injections in both pilot test areas.
5. Prior to sample collection, water levels shall be measured at designated wells.
6. ft bgs = feet below ground surface; Fe = iron; Ca = calcium; U = uranium
7. Samples for dissolved metals will be field filtered.

Figures

Figure 2-1

Site Location Map

Nuclear Metals, Inc. Site
Remedial Design Work Plan

Concord, Massachusetts

Description:

2229 Main Street Property

Map Legend:

Site Boundary

Spatial Projection:

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

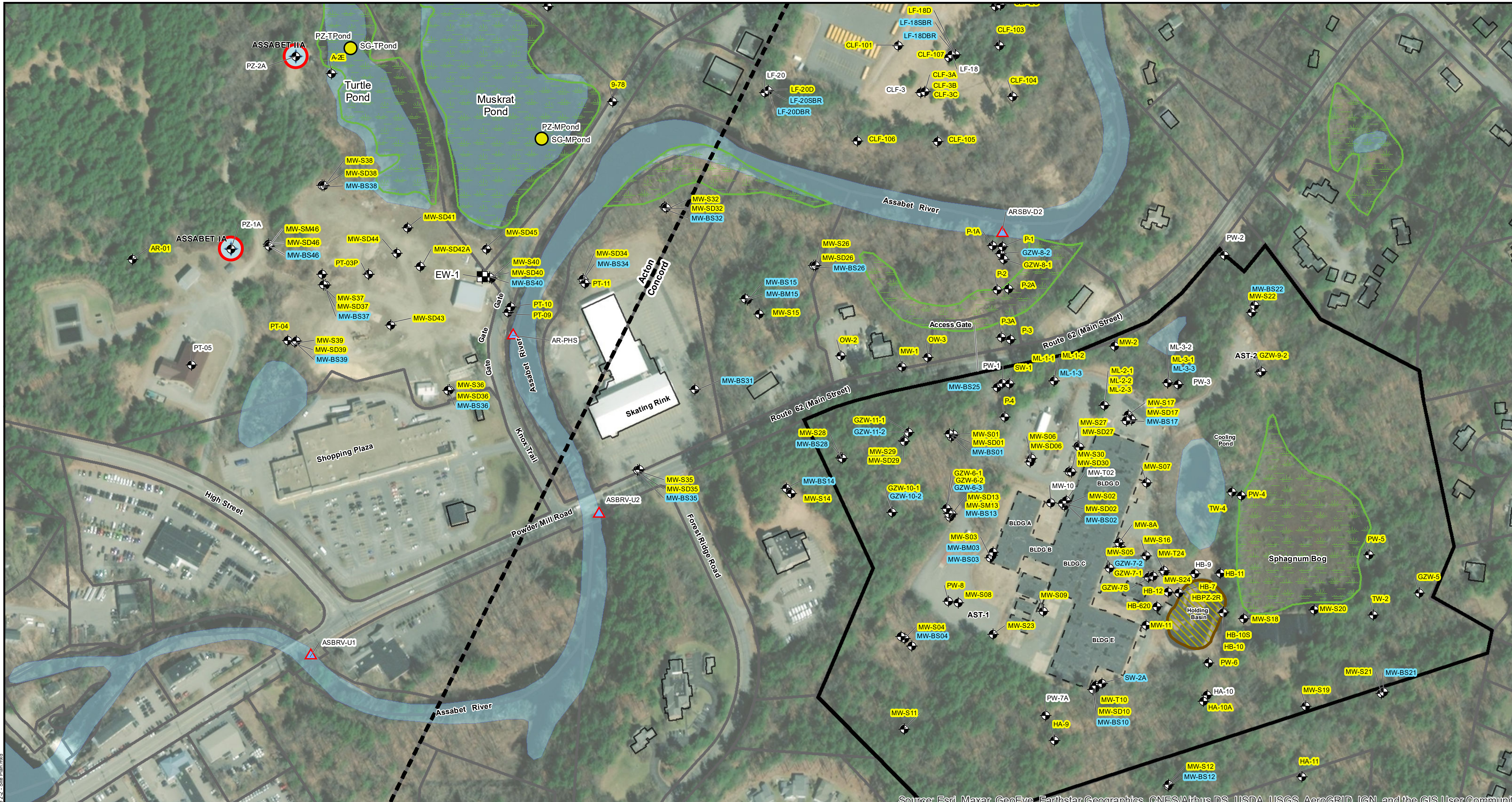
Plot Info:

File: Fig01_SiteLoc.mxd
Project No.: 3252
Plot Date: 11/19/2019
Arc Operator: LS
Reviewed by: HG

ddms
www.ddmsinc.com

de maximis, inc.

R:\Projects\DEF\demax-1547\3252-NMI RD & RA\DataAnalysis\GIS\Data\Projects\RDWP_Figures\Fig01_SiteLoc.mxd



Legend

- Extraction Well
- Monitoring Well
- Staff Gauge and Drive Point Piezometer Locations
- Active Public Water Supply Well
- Assabet River Stage Elevation
- NMI Property
- Parcel Boundaries
- Building Outline
- Former Building Concrete Foundation
- Surface Water
- Wetlands
- MW-S32 Overburden Monitoring Well
- MW-BS32 Bedrock Monitoring Well

N

0 260 Feet

Site Plan

Nuclear Metals Inc. Superfund Site
Concord, MA

Geosyntec consultants

de maximis, inc.

Acton, MA

August 2020

Figure 2-2

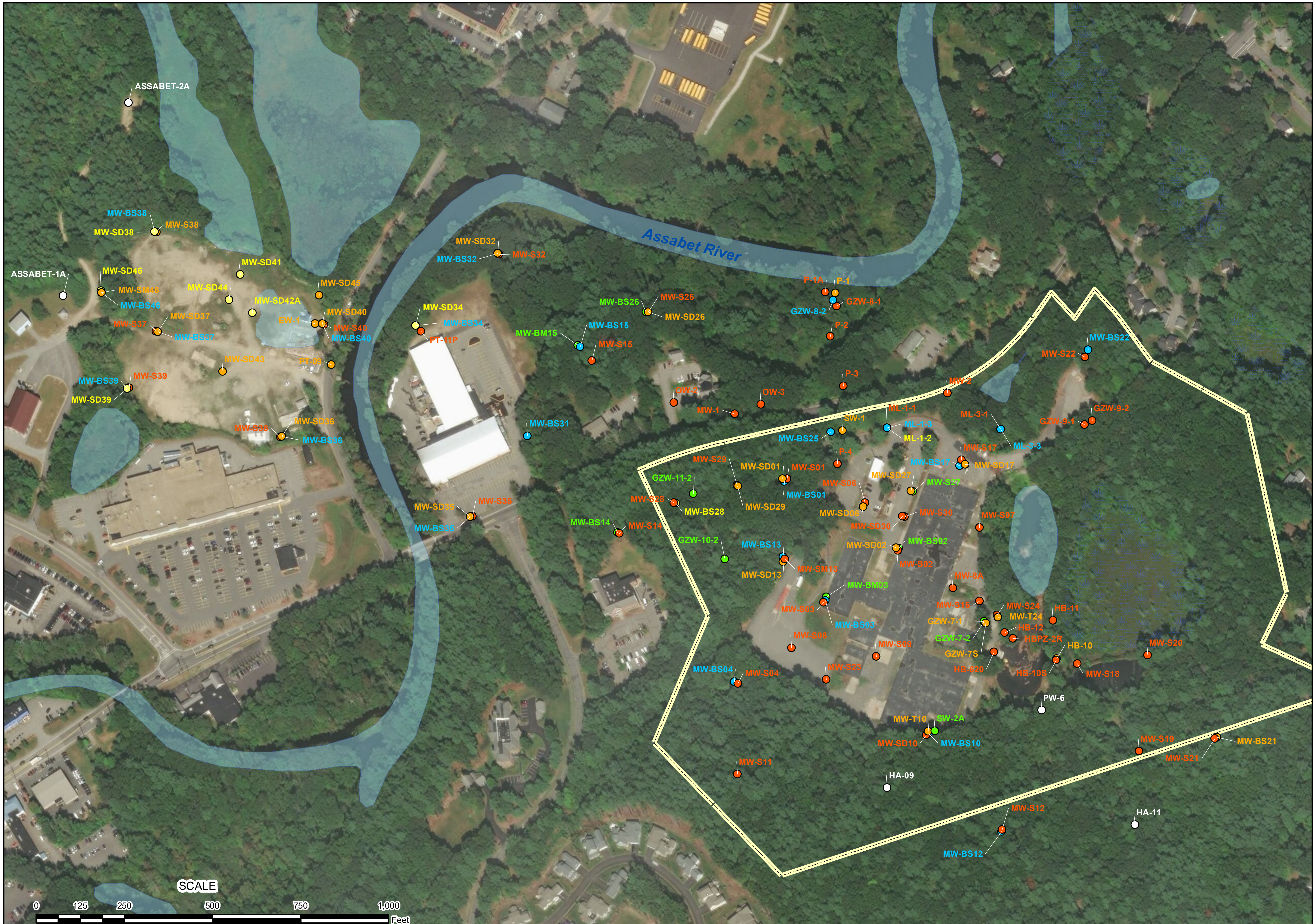


Figure 2-3

November 2019 Sampling Plan

Well Screen Lithology

Nuclear Metals Inc.
Concord, Massachusetts

Description:

Actual well sample locations for sitewide event November, 2019.

Map Legend:

Well Formation

- Undefined
- Shallow Overburden (SOB)
- Middle Overburden (MOB)
- Till
- Weathered Bedrock (WBR)
- Bedrock (BR)
- Site Boundary

Spatial Projection:

N

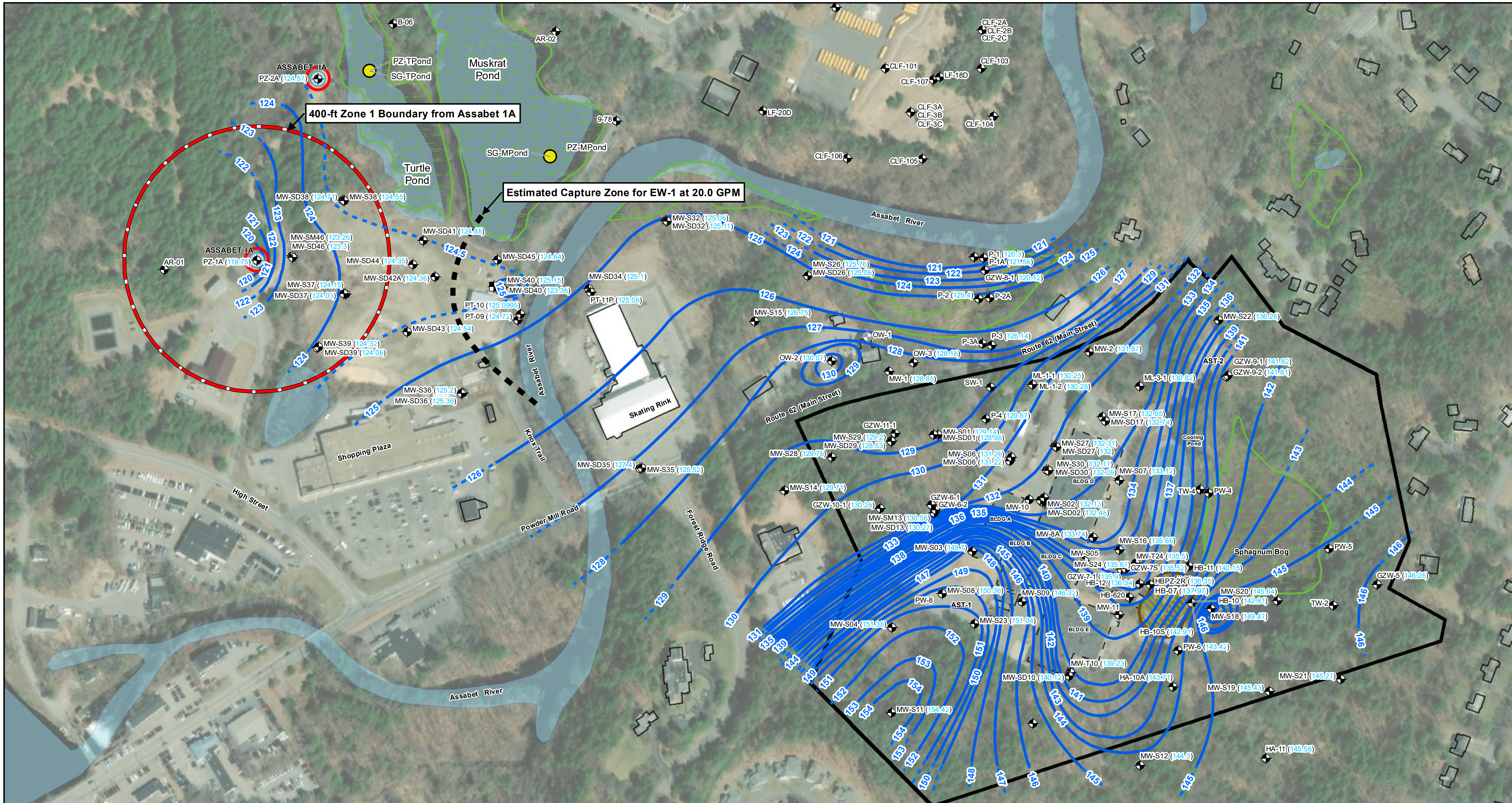
Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 14 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GIS\Data\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\Fig1.3a_Nov2019SamplingPlan_WellScreenLithology_v2.mxd



Legend

- Extraction Well
- Monitoring Well
- Abandoned Monitoring Well
- Staff Gauge and Drive Point Piezometer Locations
- Active Public Water Supply Well
- Wetlands
- Surface Water
- Site Boundary
- Former Building Concrete Foundation
- Building Outline
- Groundwater Elevation Contour in Overburden (ft NGVD) - November 2019
- Estimated Groundwater Elevation Contour in Overburden (ft NGVD) - November 2019
- (123.83) Groundwater Elevation November 10, 2019 (ft NGVD)

Notes:
1: Water levels were collected on November 10, 2019.
2: The average pumping rate at municipal well Assabet 1A, for the 24-hour period prior to the water level round was 198 gpm, and for Assabet IIA was 116 gpm.
3: Where multi-level overburden wells exist at a single location, data from the most appropriate well was prioritized in drafting contours. In general, contours represent deeper overburden.
4: Equipotentials were estimated by kriging the water elevations using Surfer 9. Kriging is a weighted moving average interpolation (extrapolation) method that minimizes the estimated variance of a predicted point (node) with the weighted average of its neighbors. The contours were further adjusted using professional judgement.
5: Groundwater elevation contours are interpreted and may not represent actual flow directions or gradients.
6: EW-1 was pumping at a rate of 20 gpm since June 6 2017. The average pumping rate at EW-1 during the 24-hour period prior to the water level round was approximately 10.8 gpm due to an 11-hour shutdown on 9 November 2019.
7: The dashed 124.5 contour was added in the Assabet well field is used to assist in evaluating EW-1 capture.
8: The November 2019 MW-S16 Depth to Water was adjusted using a limited water level round conducted on 23 January 2020.

N

0 280 Feet

Groundwater Elevations in Overburden
November 2019

Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

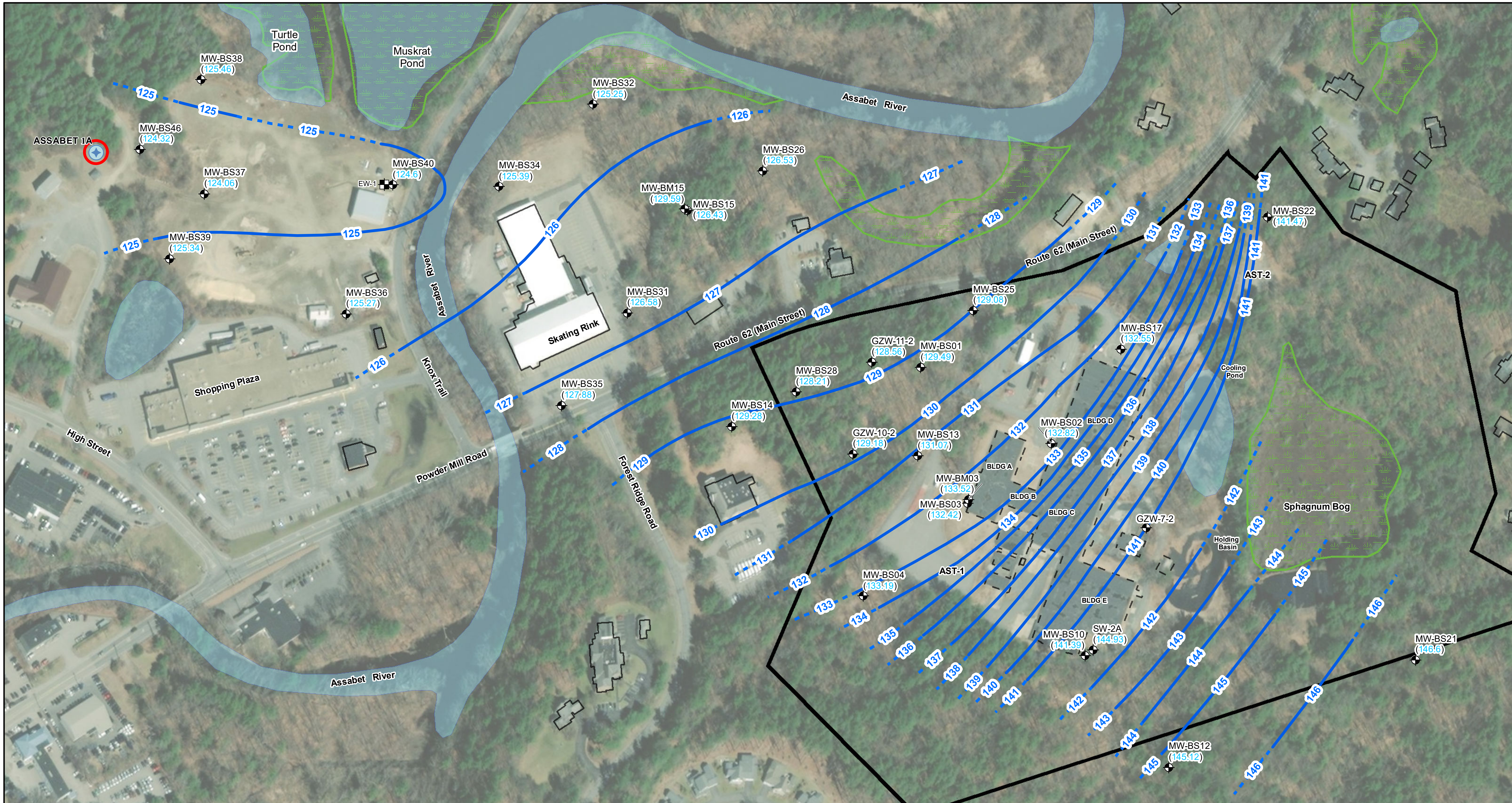
Geosyntec consultants

de maximis, inc.

Figure 2-4a

Acton, Massachusetts | August 2020

Q:\GISProjects\BR0090-NMISite\Projects\Updates_2020\Figure 2-4a - GWE OB November2019.mxd 8/4/2020 2:27:19 PM



Legend

- Extraction Well
- Monitoring Well
- Active Public Water Supply Well
- Wetlands
- Surface Water
- Site Boundary
- Groundwater Elevation Contour in Bedrock (ft NGVD) - November 2019
- Estimated Groundwater Elevation Contour in Bedrock (ft NGVD) - November 2019
- Former Building Concrete Foundation
- (123.75) Groundwater Elevation November 10, 2019 (ft NGVD)

Notes:

1: Water levels were collected on 10 November, 2019.
2: The average pumping rate at municipal well Assabet 1A, for the 24-hour period prior to the water level round was 198 gpm, and for Assabet IIA was 116 gpm.
3: Equipotentials were estimated by kriging the water elevations using Surfer 9. Kriging is a weighted moving average interpolation (extrapolation) method that minimizes the estimated variance of a predicted point (node) with the weighted average of its neighbors. The contours were further adjusted using professional judgement.
4: Groundwater elevation contours are interpreted and may not represent actual flow directions or gradients.
5: Where multi-level bedrock wells exist at a single location, data from the shallower location was prioritized in drafting contours.

N

0 220 Feet

Groundwater Elevations in Bedrock November 2019

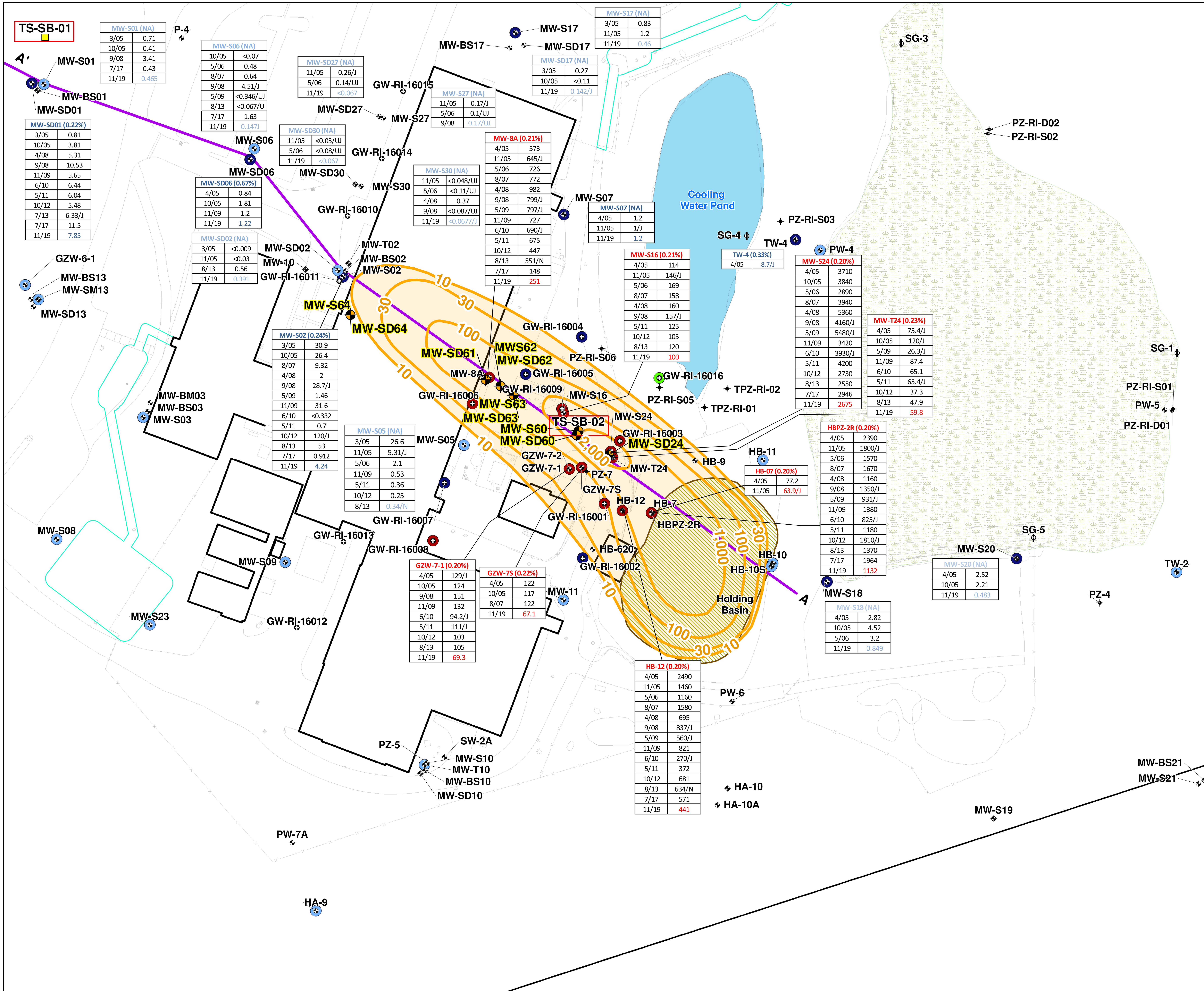
Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

Geosyntec consultants | de maximis, inc.

Acton, Massachusetts | August 2020

Figure 2-4b

Q:\GISProjects\BR0090-NMISite\Projects\Updates_2020\Figure 2-4b - GWE BR November2019.mxd 8/4/2020 3:19:59 PM



Legend

- Monitoring Well
- Piezometer
- Staff Gauge
- Groundwater Profiling Location
- Proposed Soil Sample Location
- Proposed Monitoring Well
- Holding Basin Source Control Area
- Septic Fields
- Wetlands
- Surface Water
- Uranium Contour in Overburden Groundwater, November 2019 (μg/L)
- Cross Section A-A"

Most Recent Total Uranium

- < 1 μg/L
- 1.01 - 10 μg/L
- 10.01 - 20 μg/L
- 20.01 - 30 μg/L
- > 30.01 μg/L MCL Exceedance in Overburden

Historical Total Uranium (μg/L)

HBPZ-2R (0.20%)	
Date	Total Uranium (μg/L)
8/13	1370
7/17	1964
11/19	1132

(0.21%) Represents the U-235% in the most recent sample data through November 2019

Notes:
1. Although concentrations shown are for total uranium, results shown are primarily depleted uranium (U-235% <0.6%).
2. Tabular summaries at wells downgradient of elevated total uranium are displayed for illustrative purposes only.
3. μg/L = micrograms per liter.
4. U = Not detected at or above the method detection limit shown.
5. J = Estimated value.
6. N = Indicates presumptive evidence of a compound. This flag is usually used for a tentatively identified compound, where the identification is based on a mass spectral library search.
7. Most Recent concentration text color within tabular summaries on figure coded by concentration ranges listed above.

Depleted Uranium in Overburden Groundwater - Data Through November 2019 and Proposed Monitoring Wells

Nuclear Metals Inc. Superfund Site
Concord, Massachusetts

Feet
0 20 40 80 120 160

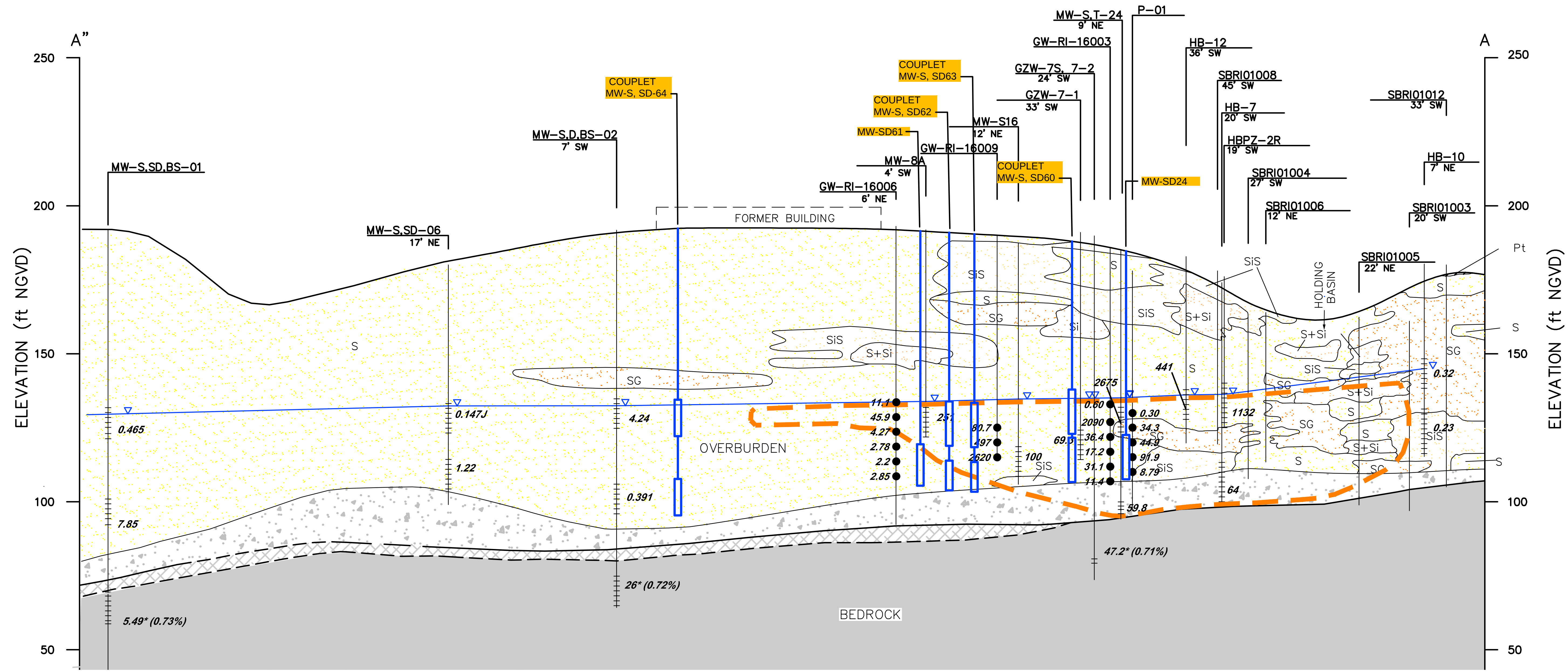
Geosyntec consultants

de maximis, inc.

Figure 2-5

Acton, Massachusetts | JUNE-2020

Q:\GISProjects\BR0090-NMI\Site\Projects\Updates_2020\Figure 2-5 Depleted Uranium in OB GW_v2.mxd



* – NATURAL ISOTOPIC SIGNATURE

LEGEND:

OVERBURDEN

SG	SAND AND GRAVEL
S	SAND
SiS	SILTY SAND
S+Si	SAND AND SILT
Si	SILT

TILL

FRACTURED BEDROCK

BEDROCK

GROUNDWATER LEVEL

SCREEN INTERVAL

GROUNDWATER PROFILE SAMPLE (2004)

124 TOTAL URANIUM CONCENTRATION (μg/L)

TOTAL URANIUM > 30 μg/L

ft NGVD FEET NATIONAL GEODETIC VERTICAL DATUM

(0.25%) REPRESENTS THE U-235% IN THE MOST RECENT SAMPLE DATA THROUGH NOVEMBER 2019

PROPOSED WELL

COUPLET MW-S, SD-64

APPROXIMATE SCREENED INTERVAL (SCREEN INTERVALS WILL BE SELECTED BASED ON FIELD OBSERVATIONS)

HORIZONTAL SCALE: 0 35' 70'

VERTICAL SCALE: 0 17.5' 35'

NOTES:

1. REFER TO FIGURE 2–5 FOR CROSS SECTION LOCATION.
2. URANIUM DATA PRESENTED IS THE MOST RECENT AT EACH LOCATION THROUGH NOVEMBER 2019.
3. ALTHOUGH CONCENTRATIONS SHOWN ARE FOR TOTAL URANIUM, RESULTS SHOWN ARE PRIMARILY DEPLETED URANIUM (U–235% <0.6%)

Depleted Total Uranium Distribution in Cross Section and Proposed New Monitoring Wells in Cross Section

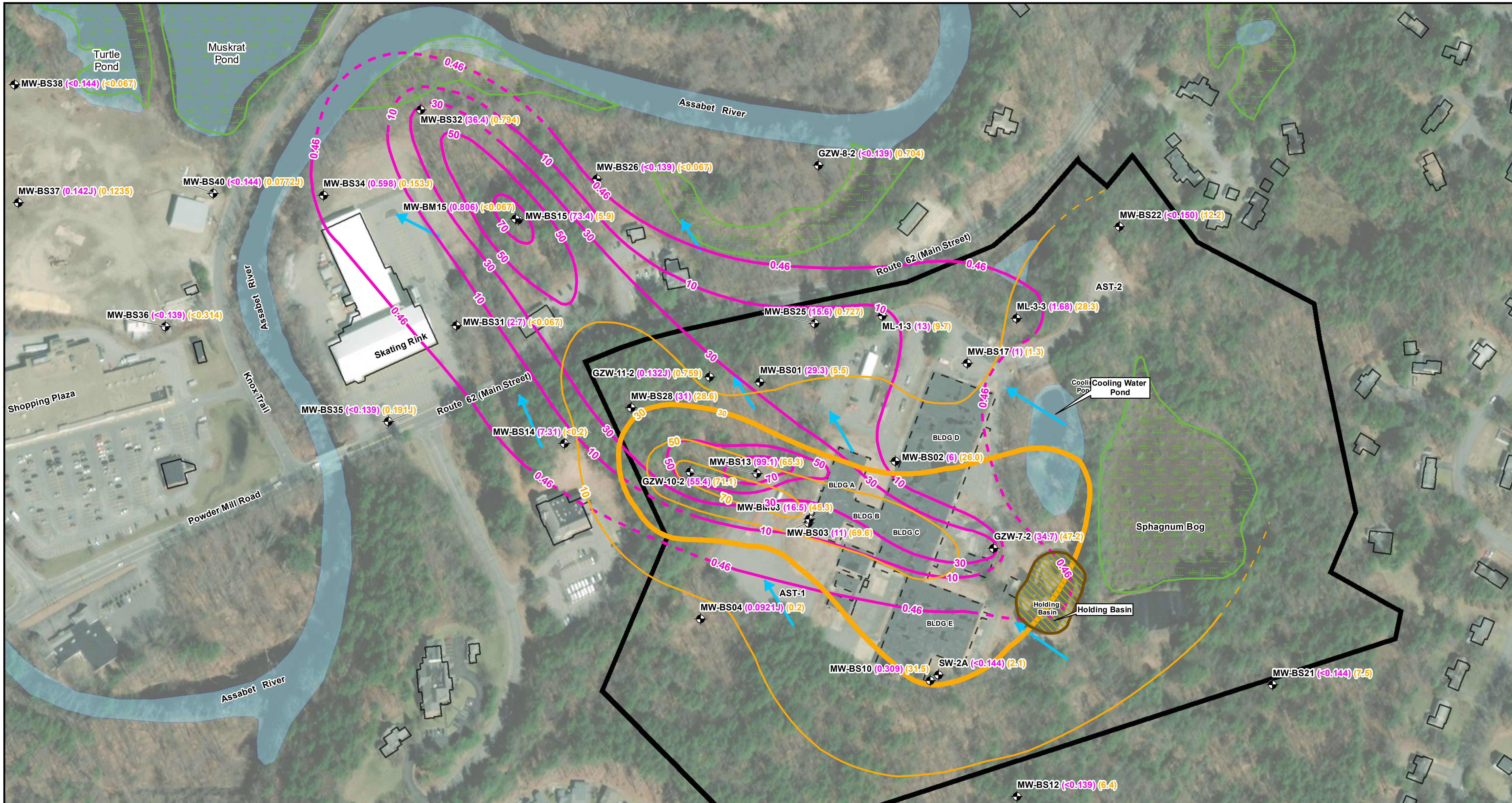
NUCLEAR METALS INC. SUPERFUND SITE
CONCORD, MASSACHUSETTS

Geosyntec consultants

ACTON, MASSACHUSETTS | JULY 2020

Figure **2-6**

T:\Projects_CADD\NM\NMI (Nuclear Metals Superfund Site)\FIGURES\2020 SECTIONS\BR0090B-F003 (SECT A w PROP WELL-EXTENDED).dwg



Legend

- Bedrock Monitoring Well
- Site Boundary
- Building Outline
- Former Building Concrete Foundation
- Bedrock Groundwater Flow Direction Inferred from November 2019 Groundwater Elevations
- Surface Water
- Wetlands
- Uranium ISO Contour in Bedrock November 2019 (µg/L)
- Estimated Uranium ISO Concentration Contour in Bedrock November 2019 ug/L
- 1,4-Dioxane ISO Concentration Contour in Bedrock November 2019 (µg/L)
- Estimated 1,4-Dioxane ISO Concentration Contour in Bedrock November 2019 (µg/L)

0.57 1,4-Dioxane Concentrations November 2019 (µg/L)

76.9 Uranium Concentrations November 2019 (µg/L)

Note:
1. The uranium concentrations shown represent total uranium. Uranium in bedrock groundwater is characterized as isotopically natural (U-235% > 0.6%).
2. < = less than laboratory method detection limit.
3. J = estimated detection below method quantitation limit.

N

0 220 Feet

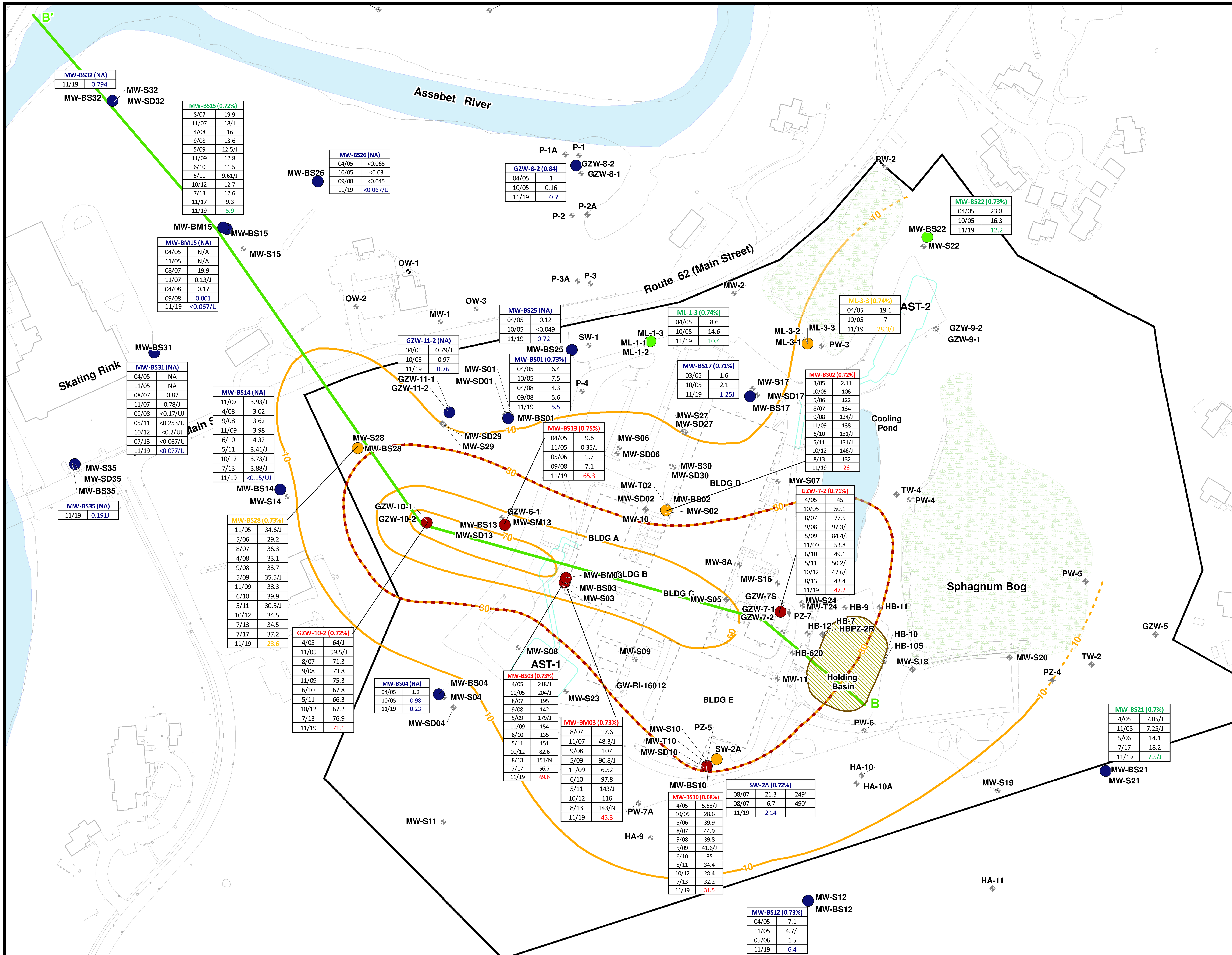
Uranium and 1,4-Dioxane Concentrations in Bedrock Groundwater - November 2019

Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

Geosyntec consultants | de maximis, inc. | Figure 2-7a

Acton, Massachusetts | July 2020

Q:\GISProjects\BR0090-NMISite\Projects\Updates_2020\Figure 2-7 - U 14D BR November 2019.mxd 4/7/2020 10:47:19 AM



Legend

- Monitoring Well
- Piezometer
- Staff Gauge
- Wetlands
- Surface Water
- Nuclear Metals Inc. Property Boundary
- Septic Fields
- Uranium MCL Exceedance (>30 µg/L)
- Cross Section B-B'

Most Recent Total Uranium

- < 1 µg/L
- 1.01 - 10 µg/L
- 10.01 - 20 µg/L
- 20.01 - 30 µg/L
- > 30.01 µg/L MCL Exceedance in Overburden

Historical Total Uranium (µg/L)

MW-BS17 (0.71%)	
Date	Total Uranium (µg/L)
03/05	1.6
10/05	2.1
11/19	1.4

Notes:
1. The uranium concentrations shown represent total uranium. Uranium in bedrock groundwater is characterized as isotopically natural (U-235% > 0.6%).
2. Percentages in the headers of the concentration tables for each well represent the U-235 to U-238 ratio in the most recent sample collected. Most recent concentration text color is coded by concentration ranges listed above.
3. < = less than laboratory method detection limit.
4. J = estimated detection below method quantitation limit.
5. MCL = Maximum Contaminant Level.
6. The B-B' cross section is presented on Figure 2-9.

Total Uranium Concentrations in Bedrock Groundwater Historical Data through November 2019

Nuclear Metals Inc. Superfund Site
Concord, Massachusetts

0 45 90 180 270 360 Feet

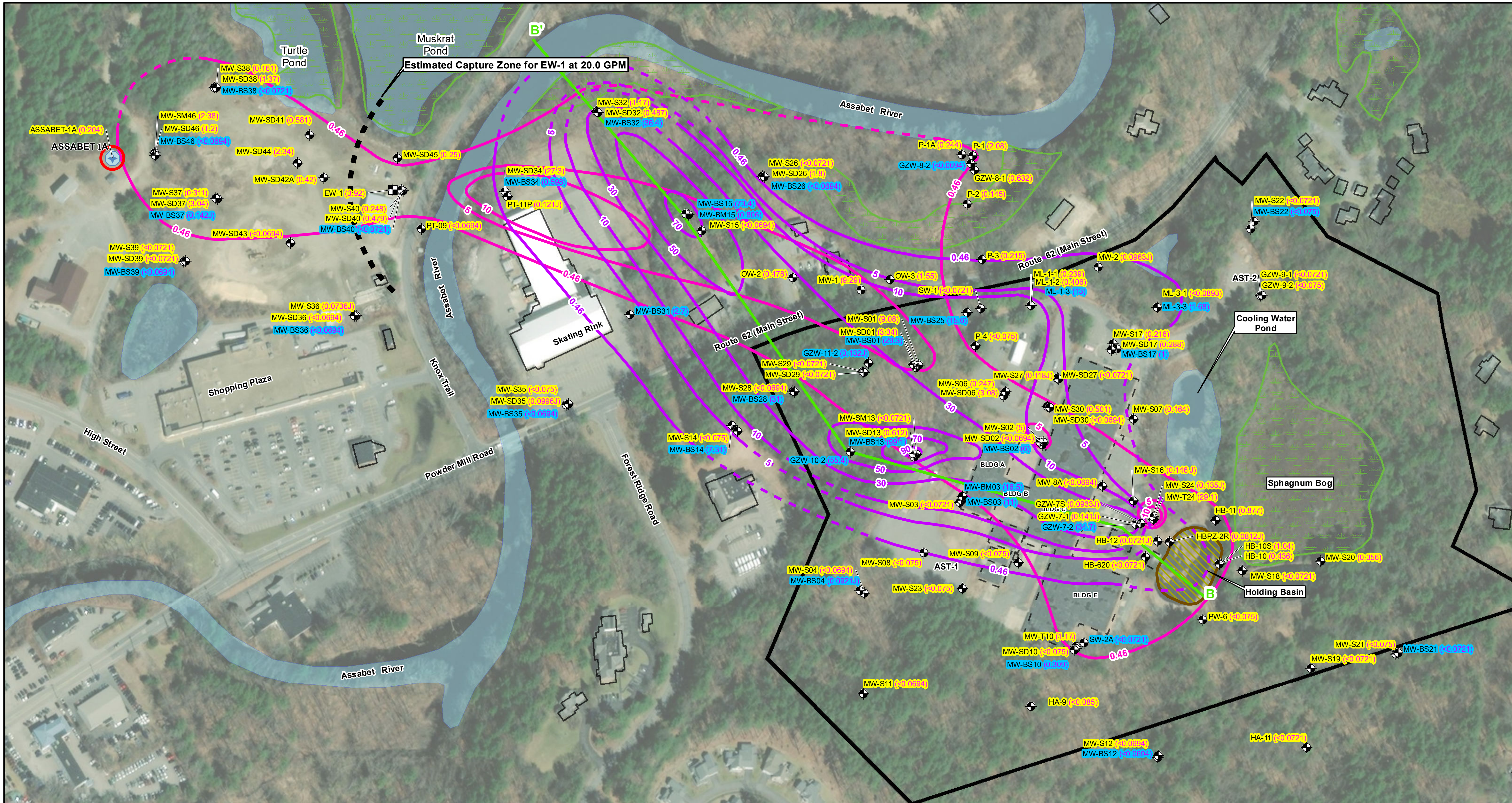
Geosyntec consultants

de maximis, inc.

Figure 2-7b

Acton, Massachusetts

Q:\GISProjects\BR0090-NMISite\Projects\Updates_2020\BR_U_thruNov19.mxd



Legend

- Extraction Well
- Monitoring Well
- Active Public Water Supply Well
- Cross Section B-B'
- Wetlands
- Surface Water
- Site Boundary
- 1,4-Dioxane Isoconcentration Contour in Overburden (µg/L) November 2019
- Estimated 1,4-Dioxane Isoconcentration Contour in Overburden (µg/L) November 2019
- 1,4-Dioxane Isoconcentration Contour in Bedrock (µg/L) November 2019
- Estimated 1,4-Dioxane Isoconcentration Contour in Bedrock (µg/L) November 2019

(125.35) 1,4-Dioxane Concentration November 2019 (µg/L)

MW-S32 Overburden Monitoring Well

MW-BS32 Bedrock Monitoring Well

Note:
1. < = less than laboratory method detection limit.
2. J = estimated detection below method quantitation limit.

N

0 200 Feet

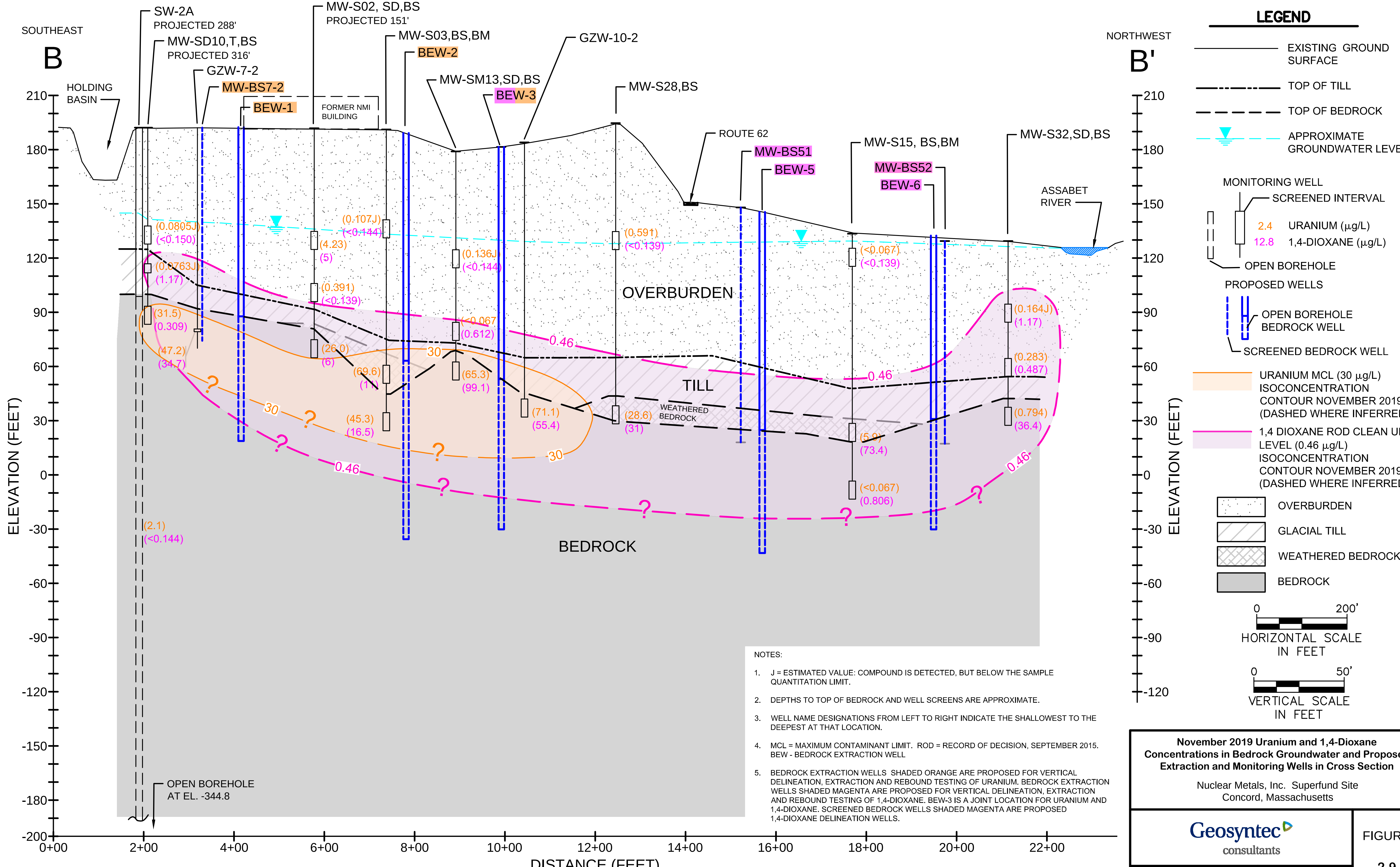
1,4-Dioxane Distribution in Overburden and Bedrock Groundwater November 2019

Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

Geosyntec consultants | de maximis, inc.

Acton, Massachusetts | August 2020

Figure 2-8



NOTES:

1. J = ESTIMATED VALUE: COMPOUND IS DETECTED, BUT BELOW THE SAMPLE QUANTITATION LIMIT.
2. DEPTHS TO TOP OF BEDROCK AND WELL SCREENS ARE APPROXIMATE.
3. WELL NAME DESIGNATIONS FROM LEFT TO RIGHT INDICATE THE SHALLOWEST TO THE DEEPEST AT THAT LOCATION.
4. MCL = MAXIMUM CONTAMINANT LIMIT. ROD = RECORD OF DECISION, SEPTEMBER 2015. BEW - BEDROCK EXTRACTION WELL
5. BEDROCK EXTRACTION WELLS SHADED ORANGE ARE PROPOSED FOR VERTICAL DELINEATION, EXTRACTION AND REBOUND TESTING OF URANIUM. BEDROCK EXTRACTION WELLS SHADED MAGENTA ARE PROPOSED FOR VERTICAL DELINEATION, EXTRACTION AND REBOUND TESTING OF 1,4-DIOXANE. BEW-3 IS A JOINT LOCATION FOR URANIUM AND 1,4-DIOXANE. SCREENED BEDROCK WELLS SHADED MAGENTA ARE PROPOSED 1,4-DIOXANE DELINEATION WELLS.

November 2019 Uranium and 1,4-Dioxane Concentrations in Bedrock Groundwater and Proposed Extraction and Monitoring Wells in Cross Section

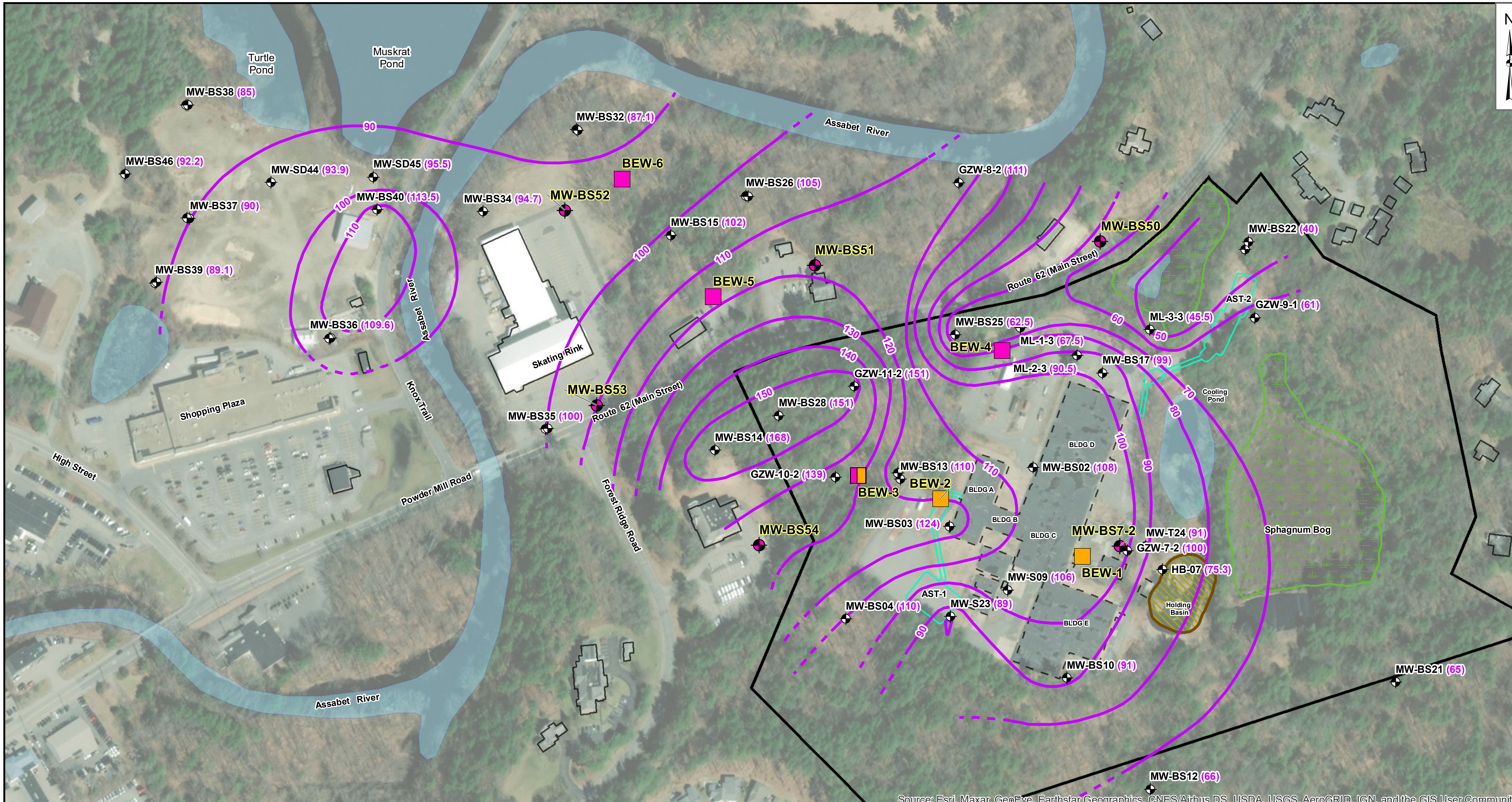
Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

Geosyntec consultants

ACTON, MA | FEBRUARY 2020

FIGURE 2-9

T:\PROJECTS_CADD\N\NMI (NUCLEAR METALS SUPERFUND SITE)\FIGURES\2020 SECTIONS\BR0090B-F001 (SECTIONS)



Legend

- Monitoring Well
- Proposed Bedrock Monitoring Well
- Proposed Open Bedrock Well for Uranium Rebound Testing
- Proposed Open Bedrock Well for 1,4-Dioxane Rebound Testing
- Proposed Open Bedrock Well for 1,4-Dioxane and Uranium Rebound Testing
- Septic Fields
- Wetlands
- Surface Water
- Site Boundary
- Depth to Bedrock Contour (dashed where inferred)
- Former Building Concrete Foundations

N

0 220 Feet

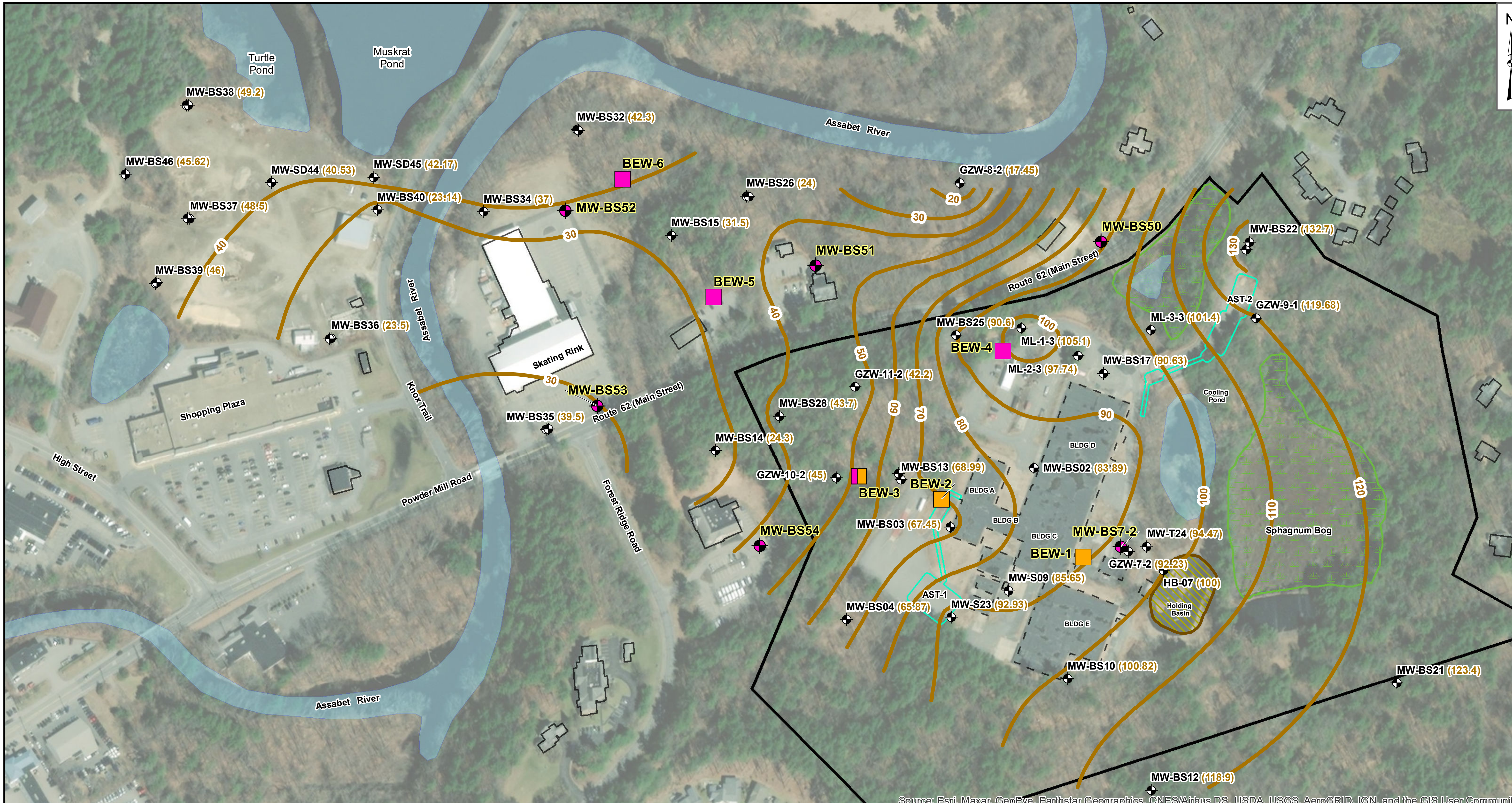
Depth to Bedrock

Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

Geosyntec consultants | de maximis, inc.

Acton, Massachusetts	July 2020	Figure 3-1

Q:\GISProjects\BR0090-NMISite\Projects\Updates_2020\Figure 3-1 Depth to Bedrock.mxd 6/8/2020 3:09:40 PM



Legend

- Monitoring Well
- Proposed Bedrock Monitoring Well
- Proposed Open Bedrock Well for Uranium Rebound Testing
- Proposed Open Bedrock Well for 1,4-Dioxane Rebound Testing
- Proposed Open Bedrock Well for 1,4-Dioxane and Uranium Rebound Testing
- Septic Fields
- Wetlands
- Surface Water
- Site Boundary
- Top of Bedrock Contours (ft NGVD)
- Former Building Concrete Foundations

N

0 220 Feet

Top of Bedrock Elevations

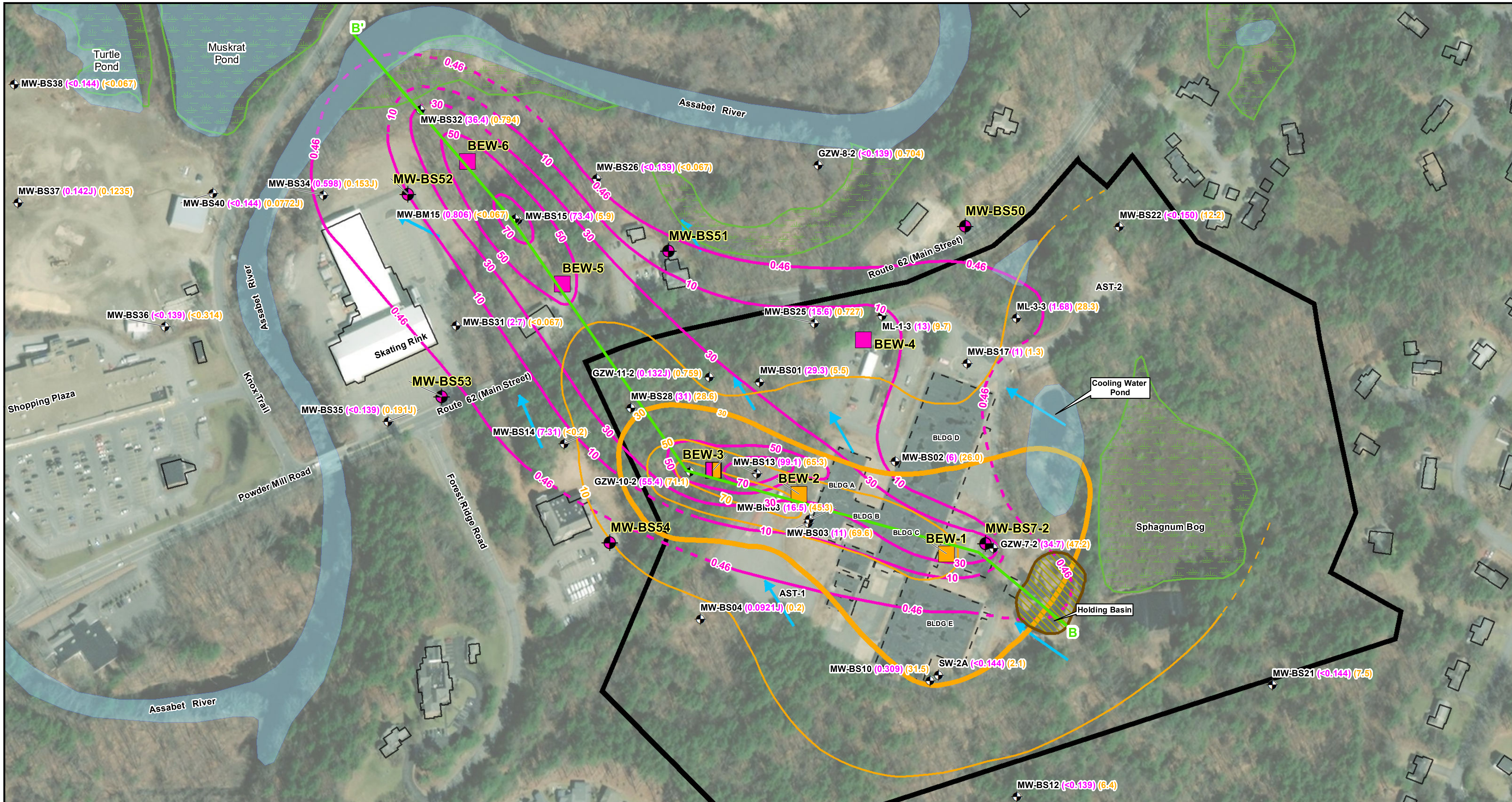
Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

Geosyntec consultants | de maximis, inc.

Acton, Massachusetts | July 2020

Figure 3-2

Q:\GISProjects\BR0090-NMISite\Projects\Updates_2020\Figure 3-2 Top of Bedrock Elevations.mxd 2/28/2020 4:54:01 PM



Legend

Bedrock Monitoring Well	
Proposed Open Bedrock Well for Uranium Rebound Testing	
Proposed Open Bedrock Well for 1,4-Dioxane Rebound Testing	
Proposed Open Bedrock Well for 1,4-Dioxane and Uranium Rebound Testing	
Proposed Bedrock Monitoring Well	
Site Boundary	
Building Outline	
Former Building Concrete Foundation	
Bedrock Groundwater Flow Direction Inferred from November 2019 Groundwater Elevations	
Wetlands	
Surface Water	
Cross Section B-B'	
Uranium ISO Contour in Bedrock November 2019 (µg/L)	
Estimated Uranium ISO Concentration Contour in Bedrock November 2019 ug/L	
1,4-Dioxane ISO Concentration Contour in Bedrock November 2019 (µg/L)	
Estimated 1,4-Dioxane ISO Concentration Contour in Bedrock November 2019 (µg/L)	
0.57	1,4-Dioxane Concentrations November 2019 (µg/L)
76.9	Uranium Concentrations November 2019 (µg/L)

Note:
1. The uranium concentrations represent isotopically natural uranium.

N

0 220 Feet

Proposed Bedrock Wells for Uranium Rebound and 1,4-dioxane Delineation and Rebound Testing

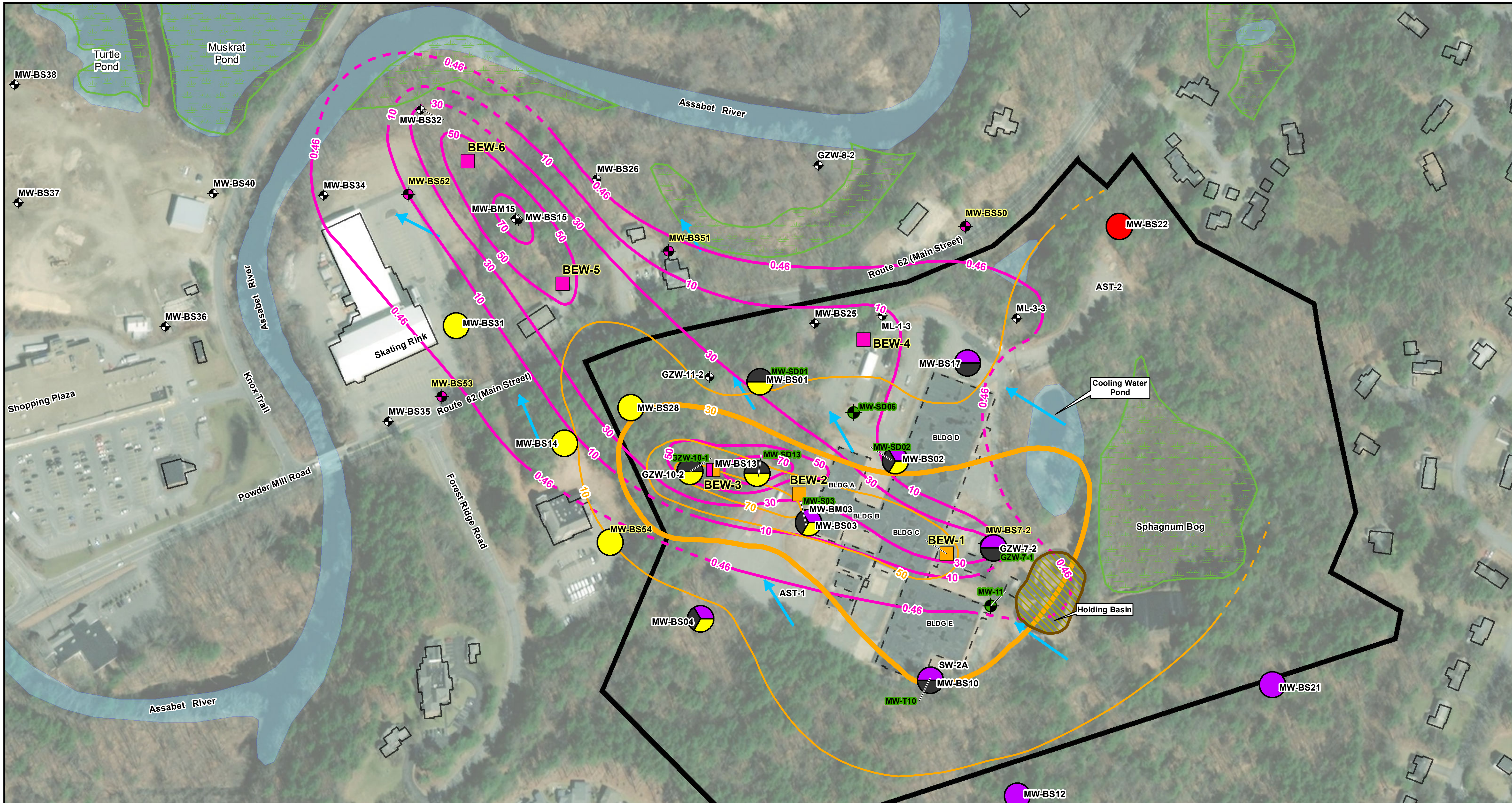
Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

Geosyntec consultants
de maximis, inc.

Acton, Massachusetts | July 2020

Figure 3-3

Q:\GISProjects\BR0090-NMISite\Projects\Updates_2020\Figure 3-3 - Proposed Bedrock Wells for Uranium Rebound and 1,4-dioxane Delineation and Rebound Testing.mxd 7/15/2020 2:13:04 PM



Bedrock Monitoring

Proposed Open Bedrock Well for Uranium Rebound

Proposed Open Bedrock Well for 1,4-Dioxane Rebound

Proposed Open Bedrock Well for 1,4-Dioxane and Uranium Rebound Testing

Proposed Bedrock Monitoring

Proposed Manual Water Level Monitoring Locations Drilling and Rebound Testing

Site

Surface Water

Building

Former Building Concrete Foundation

Bedrock Groundwater Flow Direction Inferred from November 2019 Groundwater Elevations

Uranium ISO Contour in Bedrock November 2019

1,4-Dioxane ISO Concentration Contour in Bedrock November 2019 (µg/L)

Estimated 1,4-Dioxane ISO Concentration Contour in Bedrock November 2019 (µg/L)

0.57 1,4-Dioxane Concentrations November 2019 (µg/L)

76.9 Uranium Concentrations November 2019 (µg/L)

Ambient/Background Electronic Water Level Monitoring Location

Proposed Electronic Water Level Monitoring Locations for BEW-1 Drilling and Rebound Testing

Proposed Electronic Water Level Monitoring Locations for BEW-2 Drilling and Rebound Testing

Proposed Electronic Water Level Monitoring Locations for BEW-3 Drilling and Rebound Testing

Drilling and Pumping Monitoring Locations for Bedrock Uranium Rebound Testing

Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

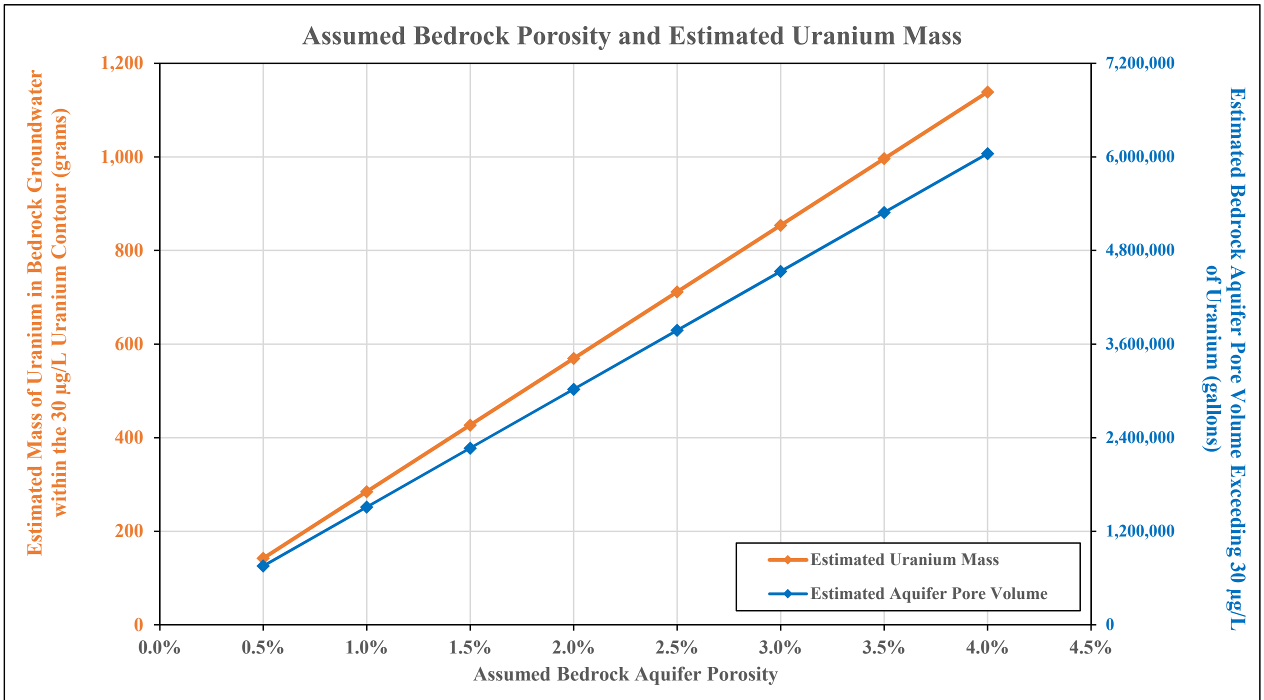
Geosyntec consultants | de maximis, inc.

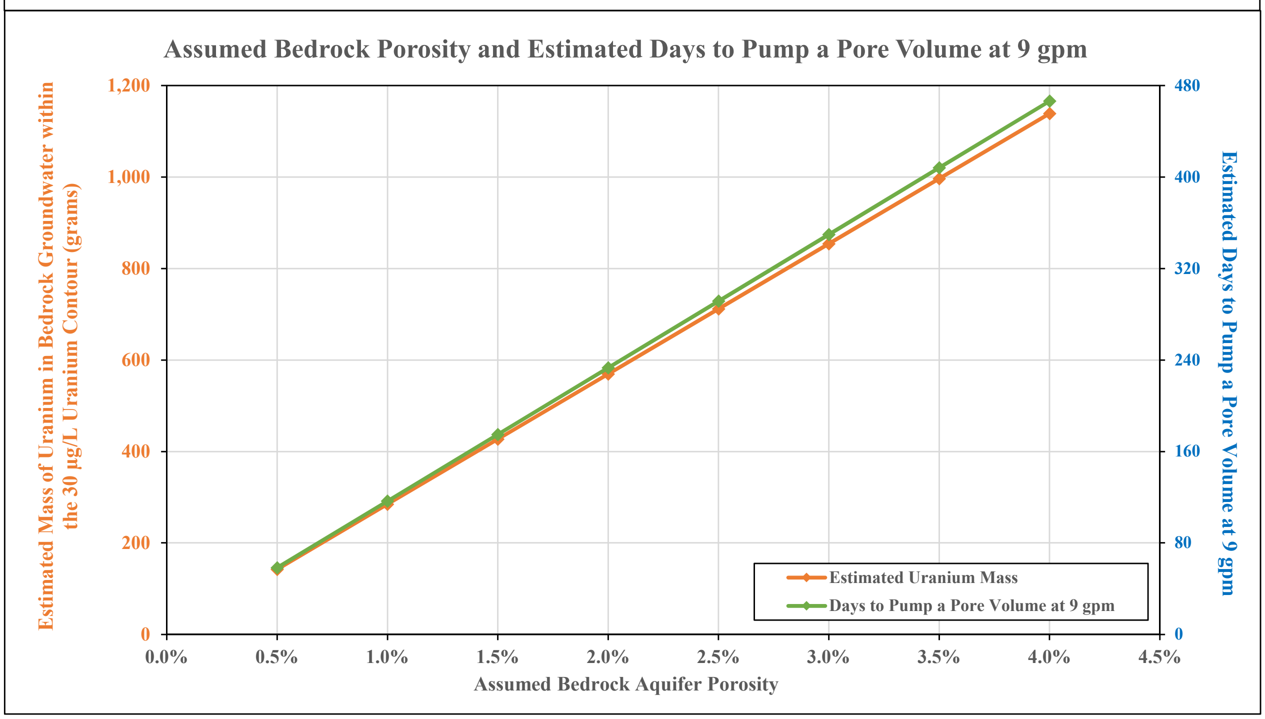
Acton, Massachusetts | July 2020

Figure 3-4

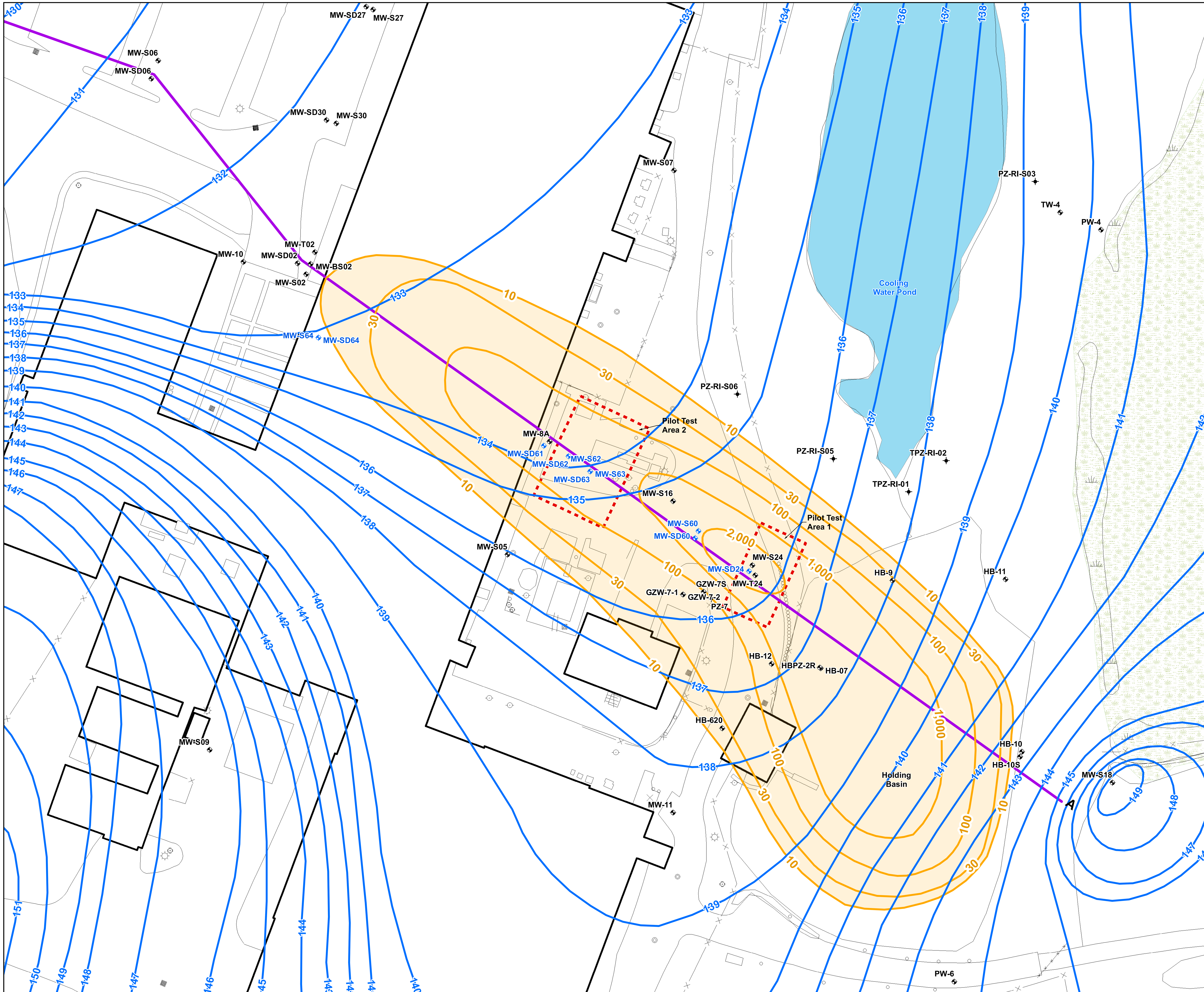
Q:\GISProjects\BR0090-NMISite\Projects\Updates_2020\Figure 3-4 - Drilling and Pumping Water Level Monitoring Locations for Bedrock Uranium Rebound Testing.mxd 7/23/2020 4:15:40 PM

Figure 3-5
Estimated Uranium Mass and Aquifer Pore Volume For Extraction Design
Nuclear Metals Inc. Superfund Site
Concord, Massachusetts





Note
1. The uranium mass was estimated by (i) calculating the area bound by each isoconcentration contour as inferred from November 2019 and an assumed saturated thickness of 40 feet, (ii) assigning the concentration as the average of the two contours binding the area, and (iii) multiplying by an assumed bedrock porosity.



Overburden ISS Pilot Test Injection Locations
November 2019 Groundwater Elevation Contours

Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

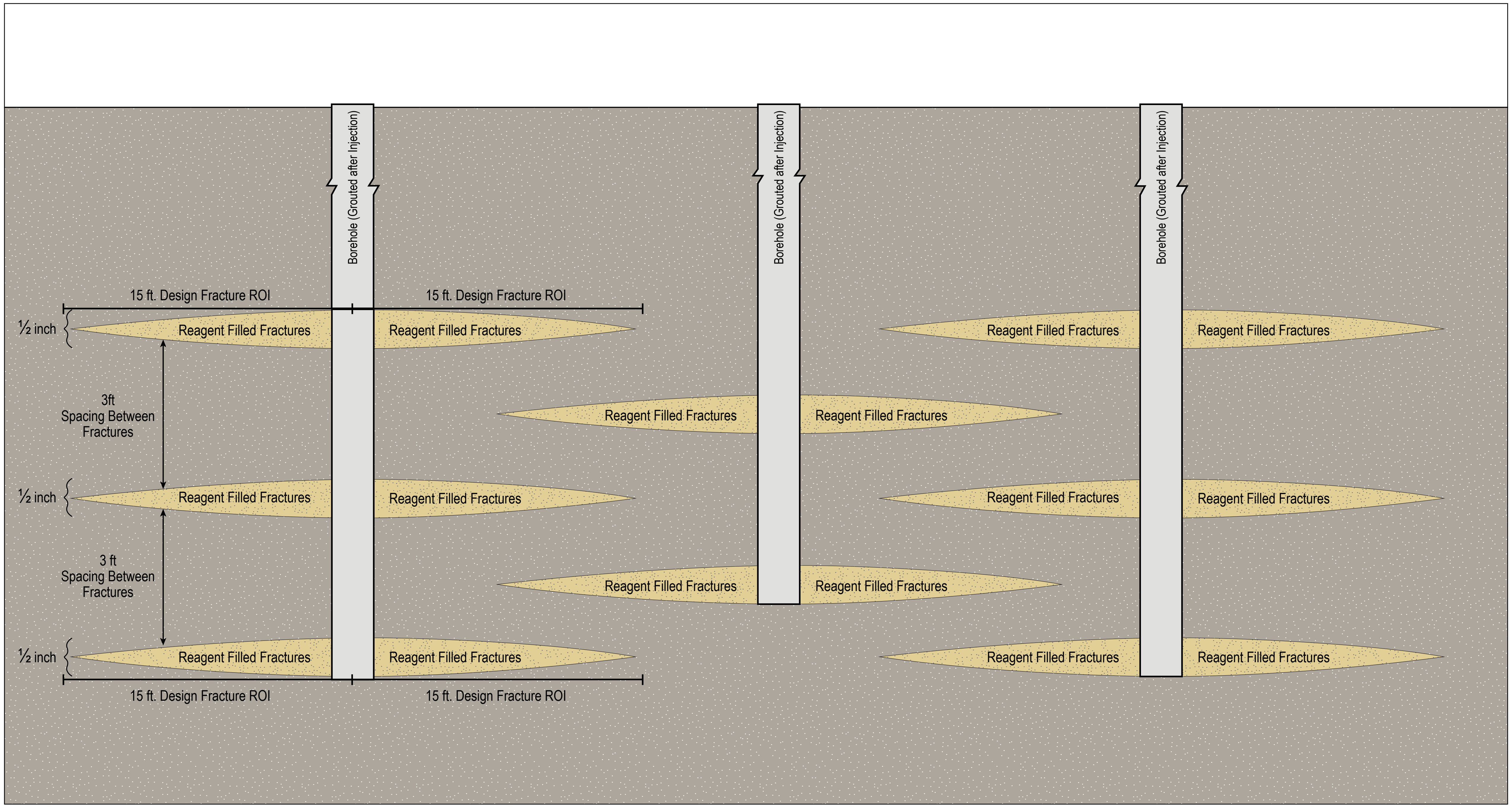
Geosyntec consultants

de maximis, inc.

Figure 4-1

Acton, Massachusetts | July 2020

Q:\GIS\Projects\BR0090-NMI\Site\Projects\Updates_2020\Figure 4-1 - OB ISS Pilot Test Injection Locations.mxd



Not to scale

<u>Acronyms and Abbreviations</u>

ROI = Radius of Injection

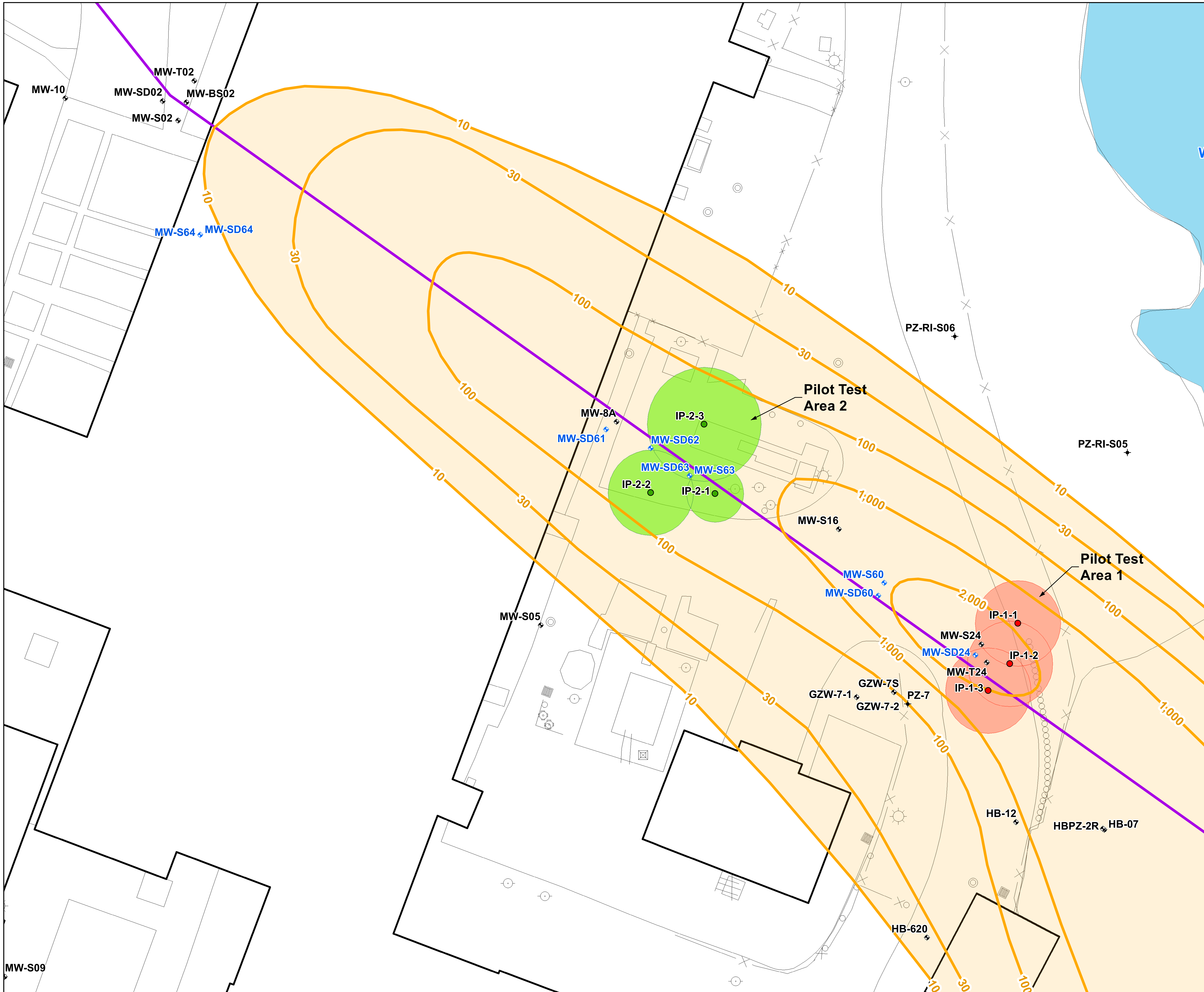
ft = feet

DPT = Direct Push Technology

Conceptual Cross Section
ISS Reagent Lenses Emplaced with DPT Jet Injection

Nuclear Metals Inc. Superfund Site, Concord, Massachusetts

de maximis, inc.	Geosyntec consultants	Figure **4-2**
Acton, Massachusetts	March 2020	



Legend

- Proposed DPT Jet Injection Location with 15 ft Design ROI
- Proposed Direct Push Injection Location with 10-20 ft Design ROI
- Proposed Monitoring Well
- Existing Monitoring Well
- Existing Piezometer
- Uranium Contour in Overburden Groundwater, November 2019 (µg/L)
- Wetlands
- Surface Water
- Former Building Footprint
- Fence
- Site Features
- Cross Section A-A"

Overburden ISS Pilot Test Injection Locations

Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

0 15 30 60 Feet

Geosyntec consultants | de maximis, inc. | Figure 4-3

Acton, Massachusetts | July 2020

Q:\GISProjects\BR0090-NMI\Site\Projects\Updates_2020\Figure 4-3 - Uranium DPT Injections.mxd

Attachment A

Compound-Specific Exceedance Figures from the November 2019 Event

Figure A-1a

PFOA Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on USEPA Screening Level (40 ng/l)

Map Legend:

Exceedance Ratios: PFOA in Overburden USEPA Screening Level (40 ng/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :10)
- ND (Count :1)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. PFOA - Perfluorooctanoic acid.
2. ND - Not detected above laboratory method detection limit.
3. ng/l - nanograms per liter.

Spatial Projection:

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-1b

PFOA Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on USEPA Screening Level (40 ng/l)

Map Legend:

Exceedance Ratios: PFOA in Bedrock USEPA Screening Level (40 ng/l)

- > 10x (Count :0)
- > 5x (Count :1)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :2)
- ND (Count :5)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. PFOA - Perfluorooctanoic acid.
2. ND - Not detected above laboratory method detection limit.
3. ng/l - nanograms per liter.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

Figure A-2a

PFOS Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on USEPA Screening Level (40 ng/l)

Map Legend:

Exceedance Ratios: PFOS in Overburden USEPA Screening Level (40 ng/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :9)
- ND (Count :2)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. PFOS - Perfluorooctanesulfonic acid.
2. ND - Not detected above laboratory method detection limit.
3. ng/l - nanograms per liter.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-1547\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-2b

PFOS Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on USEPA Screening Level (40 ng/l)

Map Legend:

Exceedance Ratios:
PFOS in Bedrock
USEPA Screening Level (40 ng/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :7)
- ND (Count :2)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. PFOS - Perfluorooctanesulfonic acid.
2. ND - Not detected above laboratory method detection limit.
3. ng/l - nanograms per liter.

Spatial Projection:

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-3a

PFOA/PFOS Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on USEPA PRG Level (70 ng/l)

Map Legend:

Exceedance Ratios: PFOA/PFOS in Overburden USEPA PRG Level (70 ng/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :11)
- ND (Count :0)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. PFOA - Perfluorooctanoic acid; PFOS - Perfluorooctanesulfonic acid.
2. ND - Not detected above laboratory method detection limit.
3. ng/l - nanograms per liter.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-3b

PFOA/PFOS Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on USEPA PRG Level (70 ng/l)

Map Legend:

Exceedance Ratios: PFOA/PFOS in Bedrock USEPA PRG Level (70 ng/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :1)
- > 1x (Count :0)
- < Cleanup Level (Count :6)
- ND (Count :1)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. PFOA - Perfluorooctanoic acid; PFOS - Perfluorooctanesulfonic acid.
2. ND - Not detected above laboratory method detection limit.
3. ng/l - nanograms per liter.

Spatial Projection:

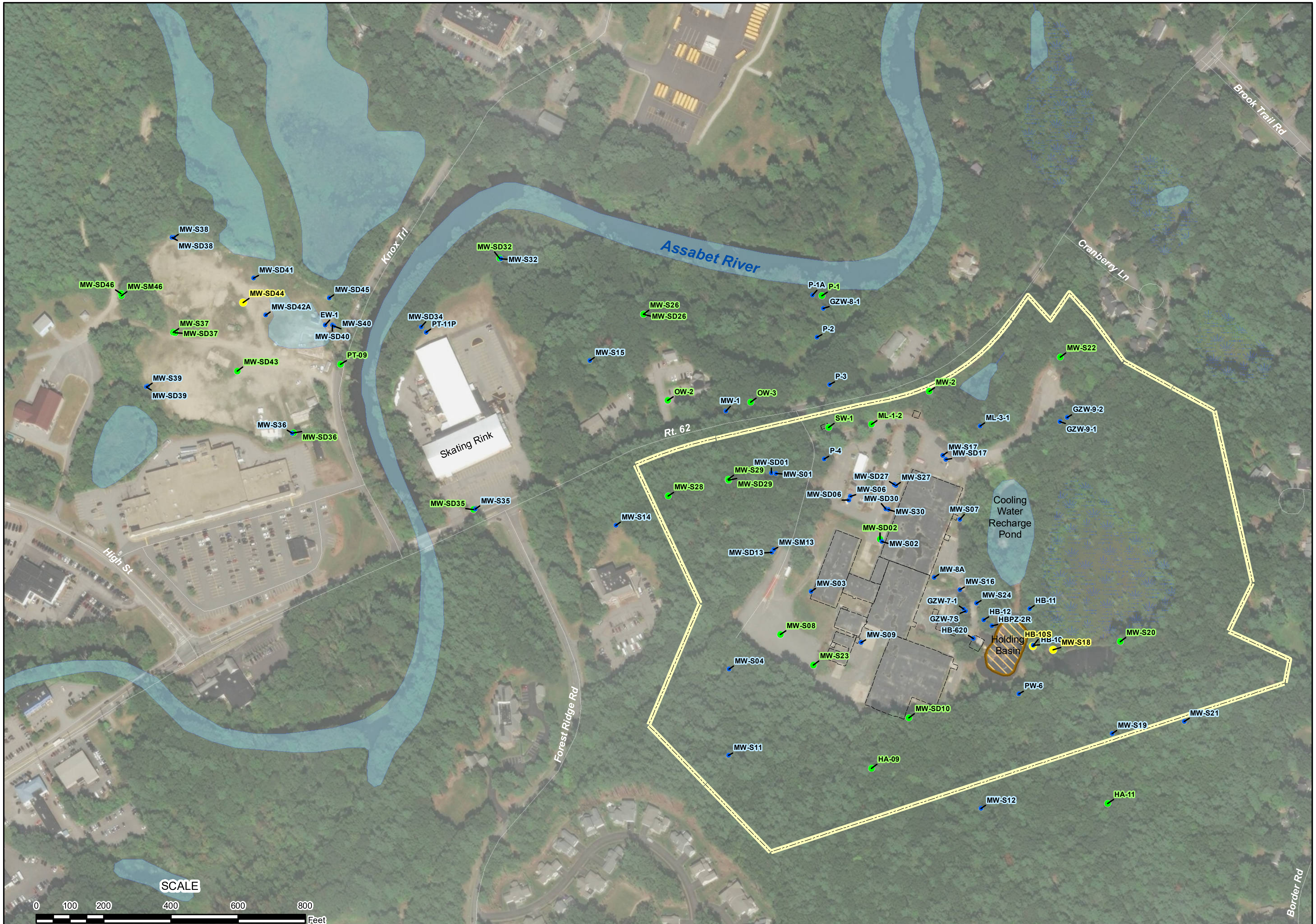
Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd



R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-4a

Arsenic Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (10 ug/l)

Map Legend:

Exceedance Ratios: Arsenic in Overburden ROD Level (10 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :3)
- < Cleanup Level (Count :28)
- ND (Count :58)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

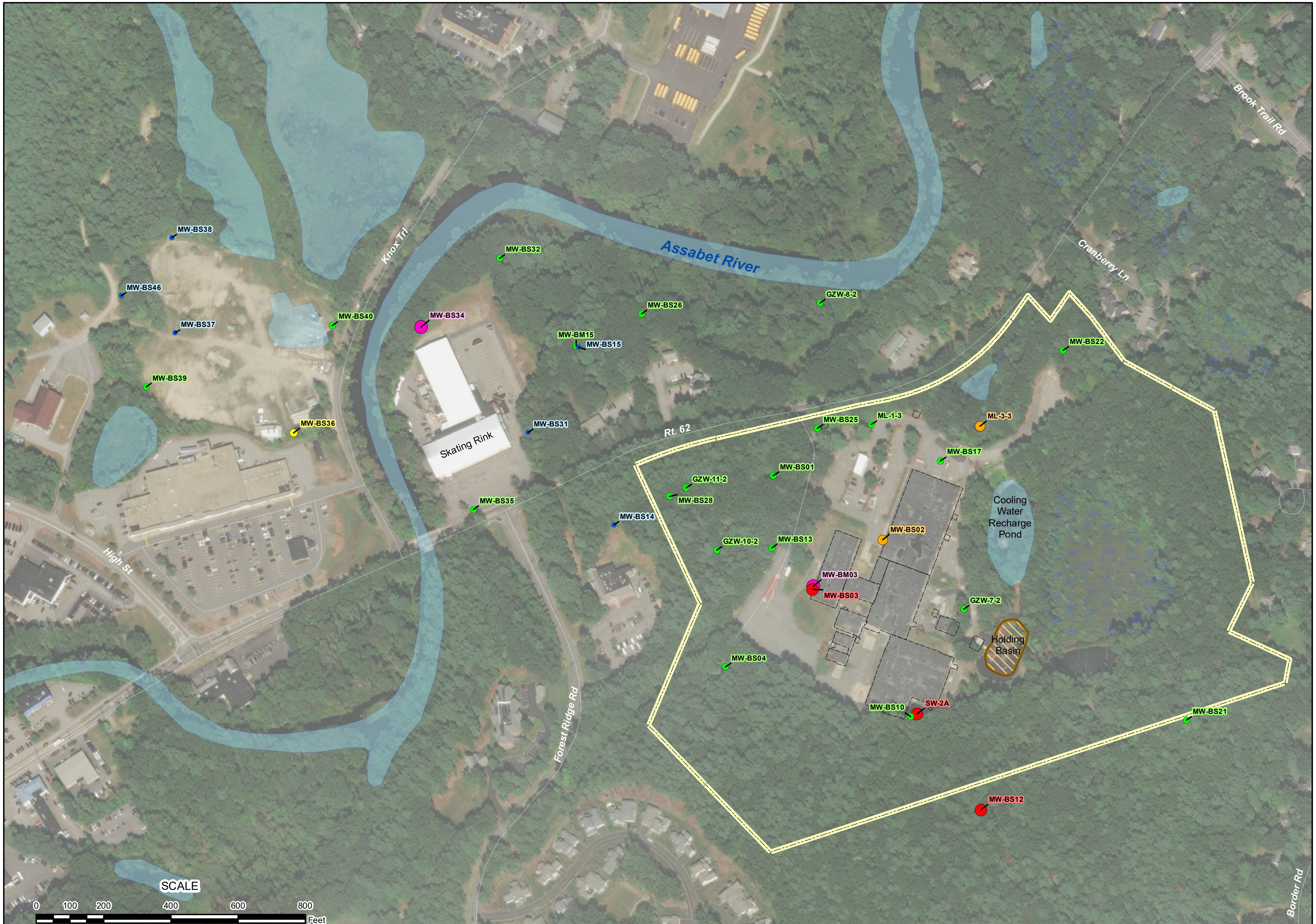


Figure A-4b

Arsenic Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (10 ug/l)

Map Legend:

Exceedance Ratios: Arsenic in Bedrock ROD Level (10 ug/l)

- > 10x (Count :2)
- > 5x (Count :3)
- > 2x (Count :2)
- > 1x (Count :1)
- < Cleanup Level (Count :20)
- ND (Count :6)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

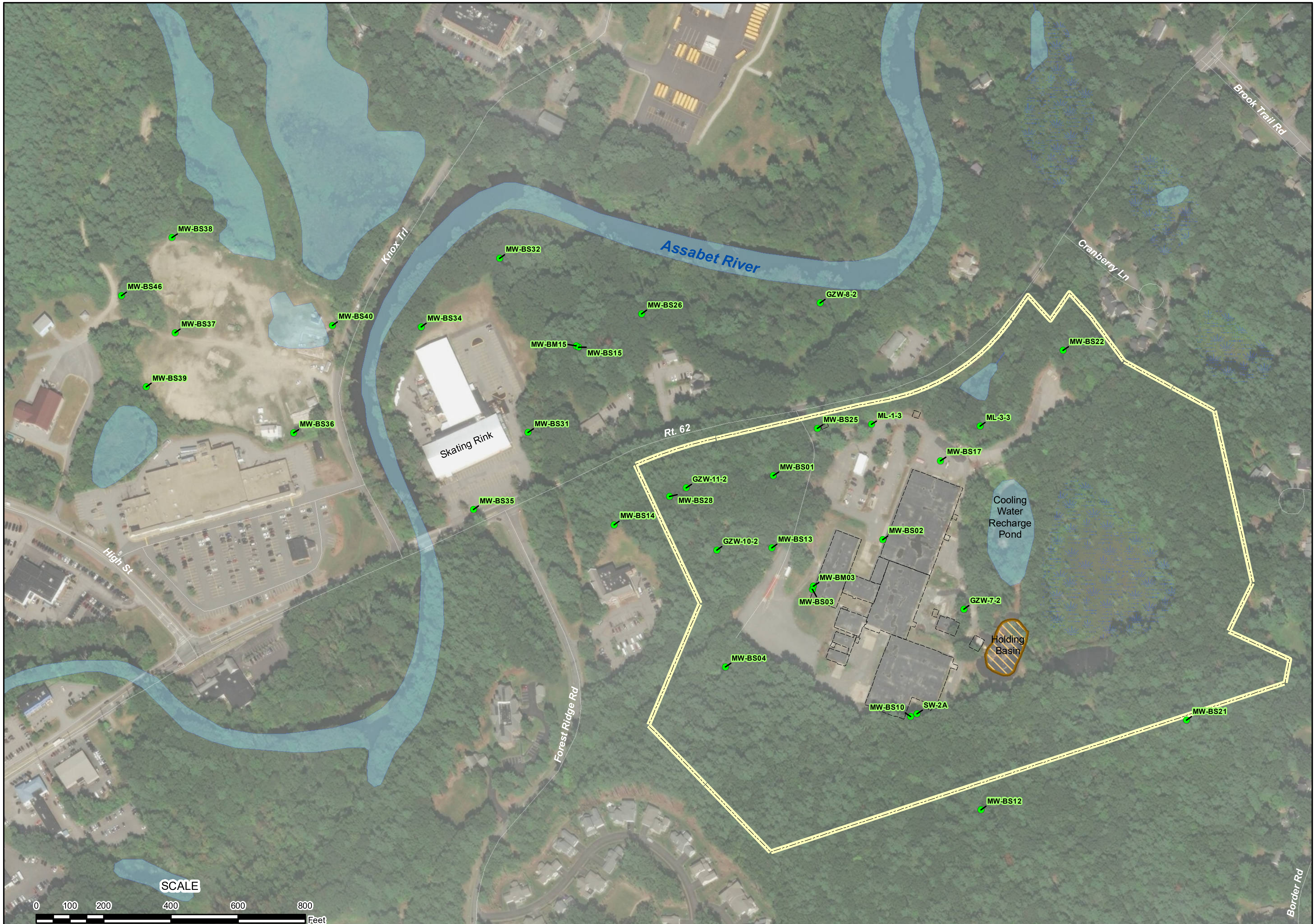


Figure A-5

Barium Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (2000 ug/l)

Map Legend:

Exceedance Ratios: Barium in Bedrock ROD Level (2000 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :34)
- ND (Count :0)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GIS\Data\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-6a

Chromium Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Description:

Exceedances based on ROD Level (100 ug/l)

Map Legend:

Exceedance Ratios: Chromium in Overburden ROD Level (100 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :13)
- ND (Count :76)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-1547\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-6b

Chromium Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (100 ug/l)

Map Legend:

Exceedance Ratios: Chromium in Bedrock ROD Level (100 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :9)
- ND (Count :25)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

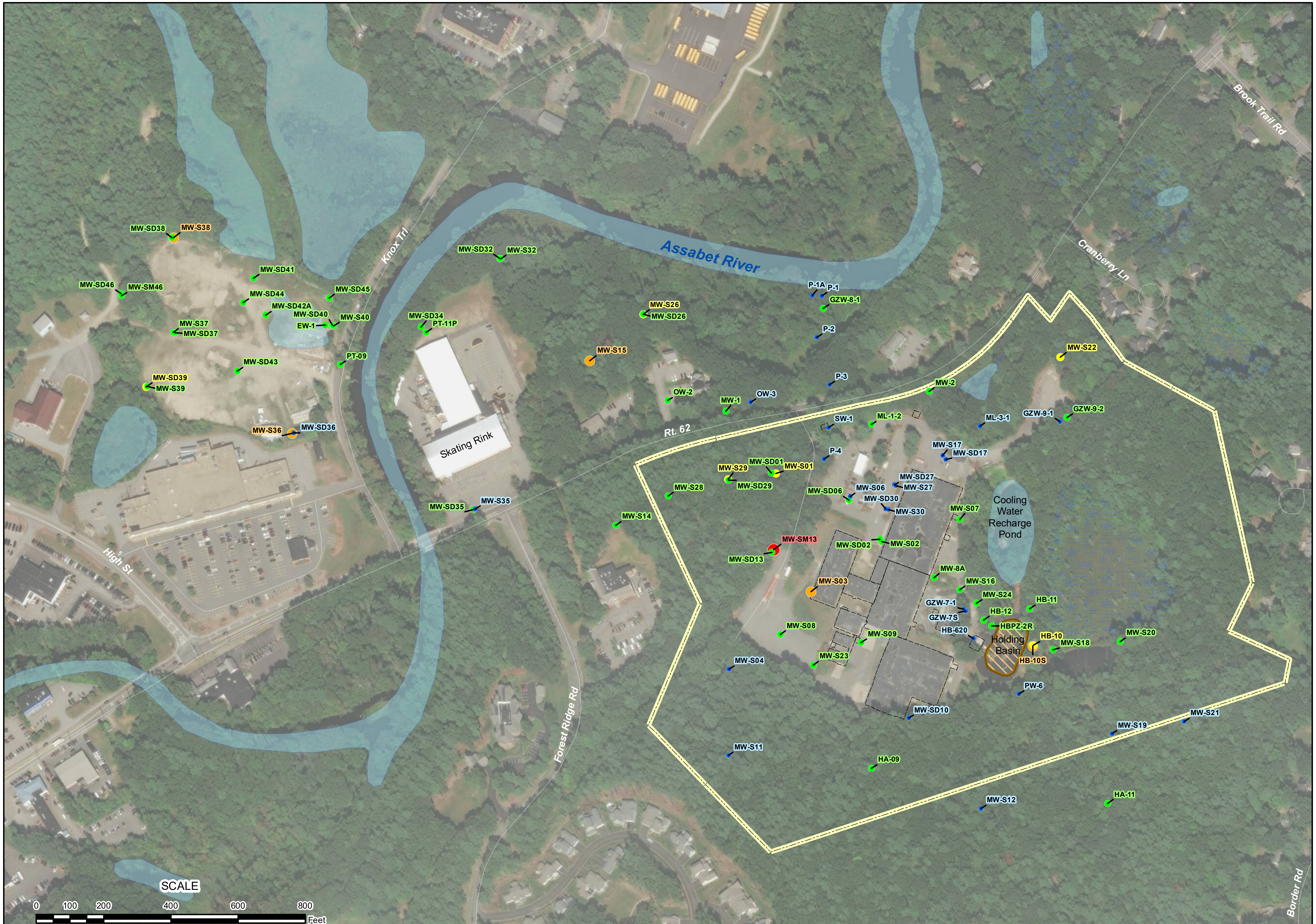


Figure A-7a

Cobalt Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (6 ug/l)

Map Legend:

Exceedance Ratios: Cobalt in Overburden ROD Level (6 ug/l)

- > 10x (Count :0)
- > 5x (Count :1)
- > 2x (Count :5)
- > 1x (Count :6)
- < Cleanup Level (Count :49)
- ND (Count :28)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GIS\Data\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-7b

Cobalt Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (6 ug/l)

Map Legend:

Exceedance Ratios: Cobalt in Bedrock ROD Level (6 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :1)
- > 1x (Count :1)
- < Cleanup Level (Count :18)
- ND (Count :14)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

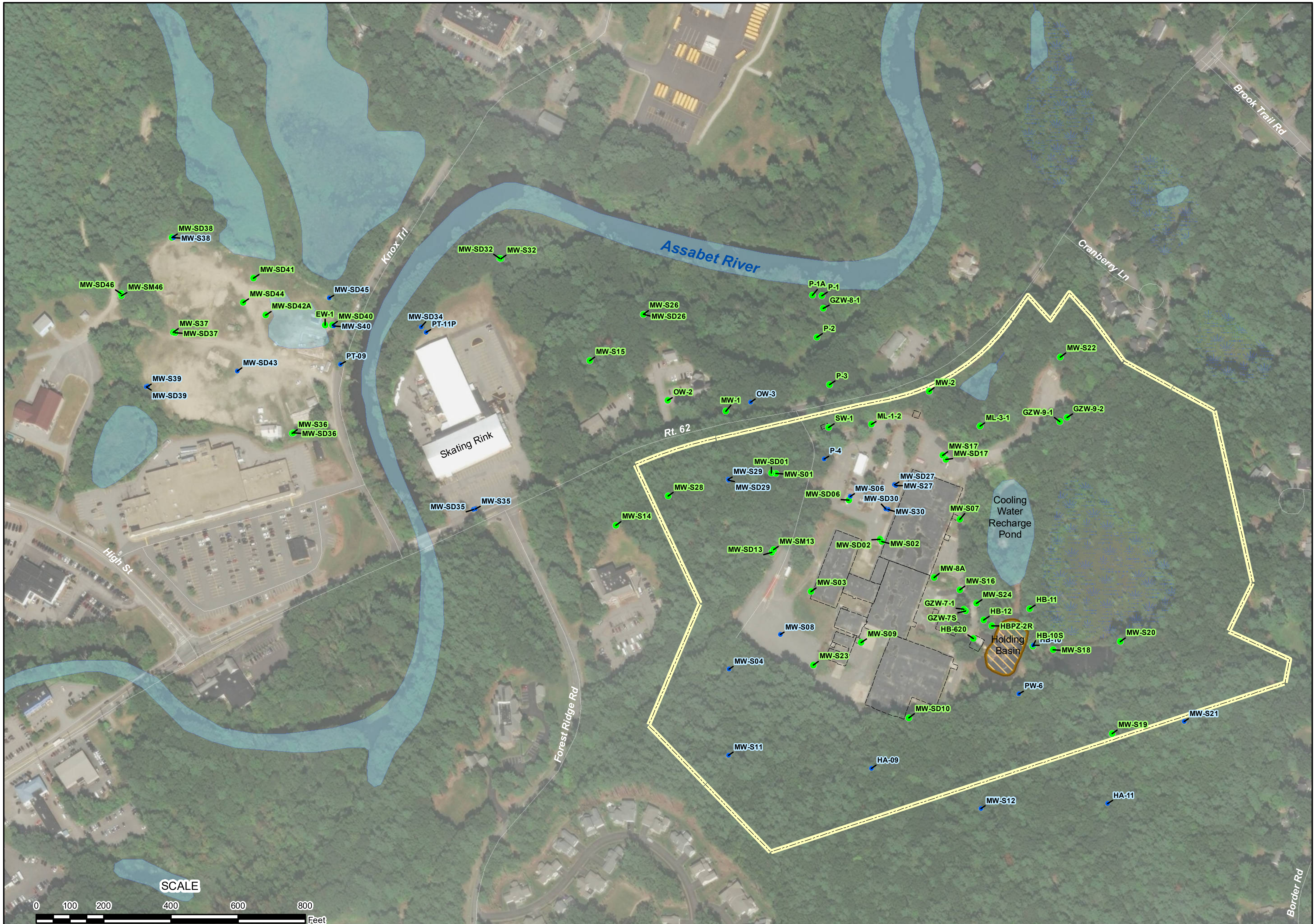
Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd



R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-8

Copper Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (1300 ug/l)

Map Legend:

Exceedance Ratios: Copper in Overburden ROD Level (1300 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :60)
- ND (Count :29)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

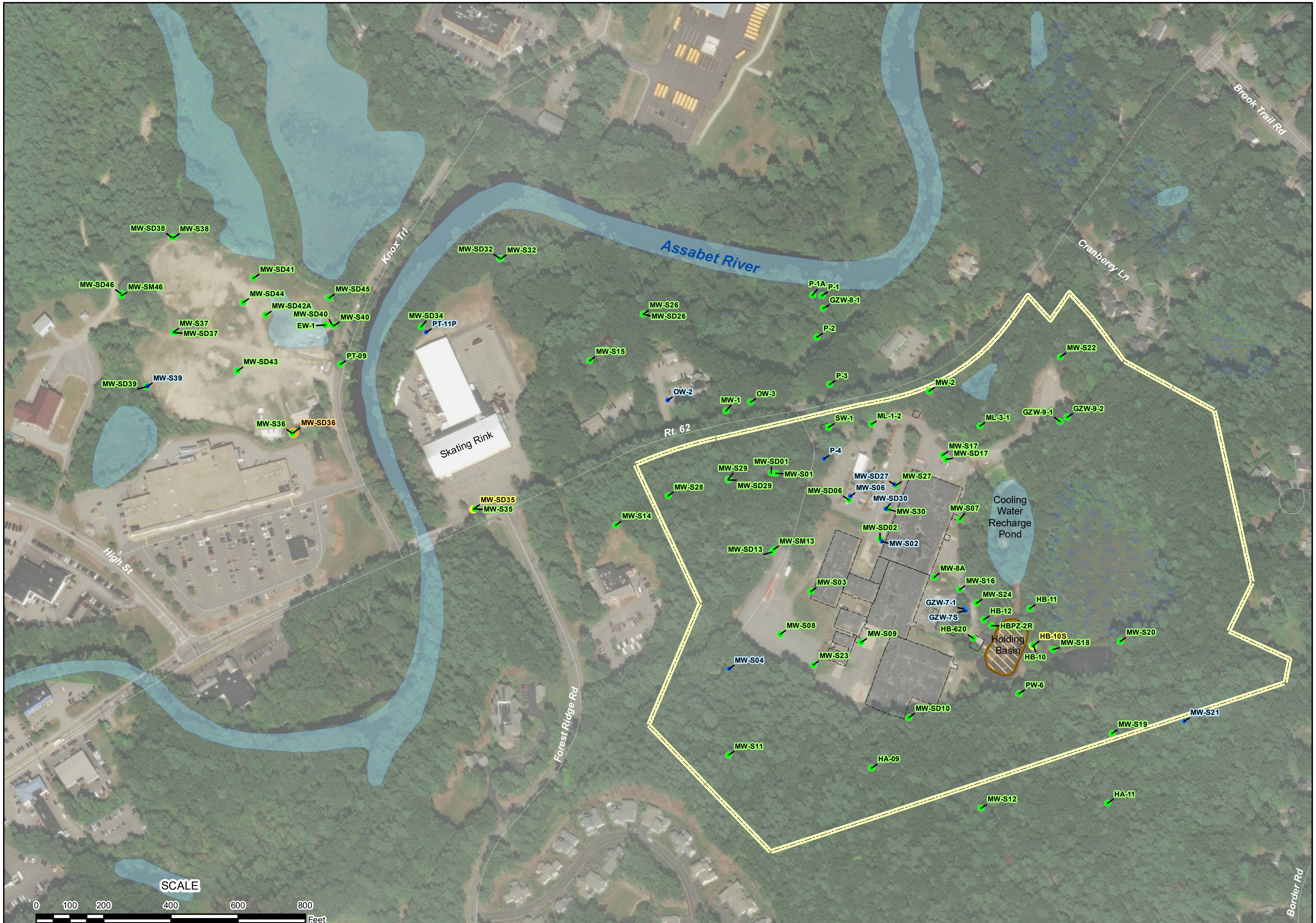


Figure A-9a

Iron Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (14000 ug/l)

Map Legend:

Exceedance Ratios: Iron in Overburden ROD Level (14000 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :1)
- > 1x (Count :2)
- < Cleanup Level (Count :74)
- ND (Count :12)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-9b

Iron Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (14000 ug/l)

Map Legend:

Exceedance Ratios: Iron in Bedrock ROD Level (14000 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :1)
- < Cleanup Level (Count :31)
- ND (Count :2)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

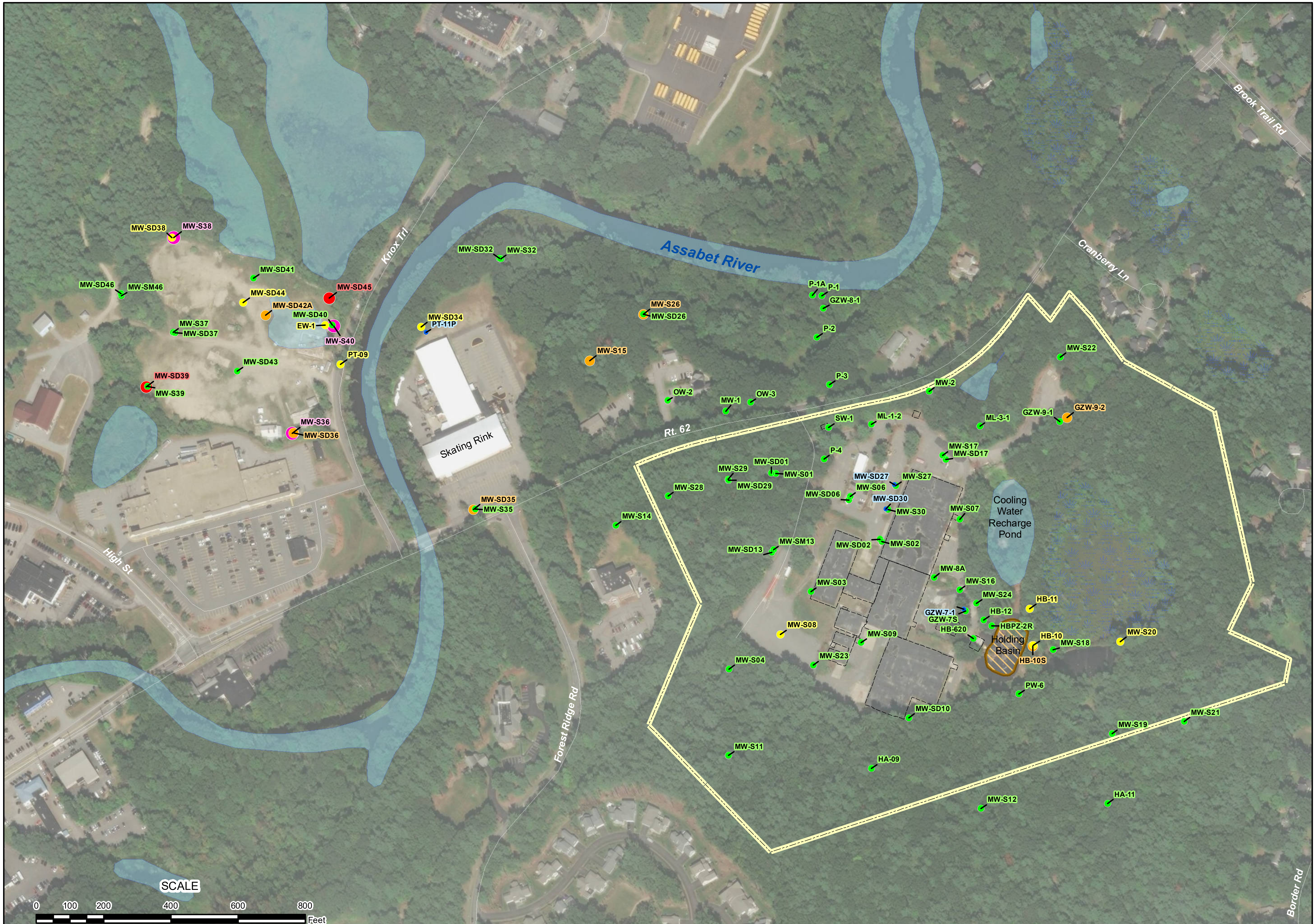
Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd



R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-10a

Manganese Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (300 ug/l)

Map Legend:

Exceedance Ratios: Manganese in Overburden ROD Level (300 ug/l)

- > 10x (Count :3)
- > 5x (Count :2)
- > 2x (Count :7)
- > 1x (Count :9)
- < Cleanup Level (Count :64)
- ND (Count :4)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

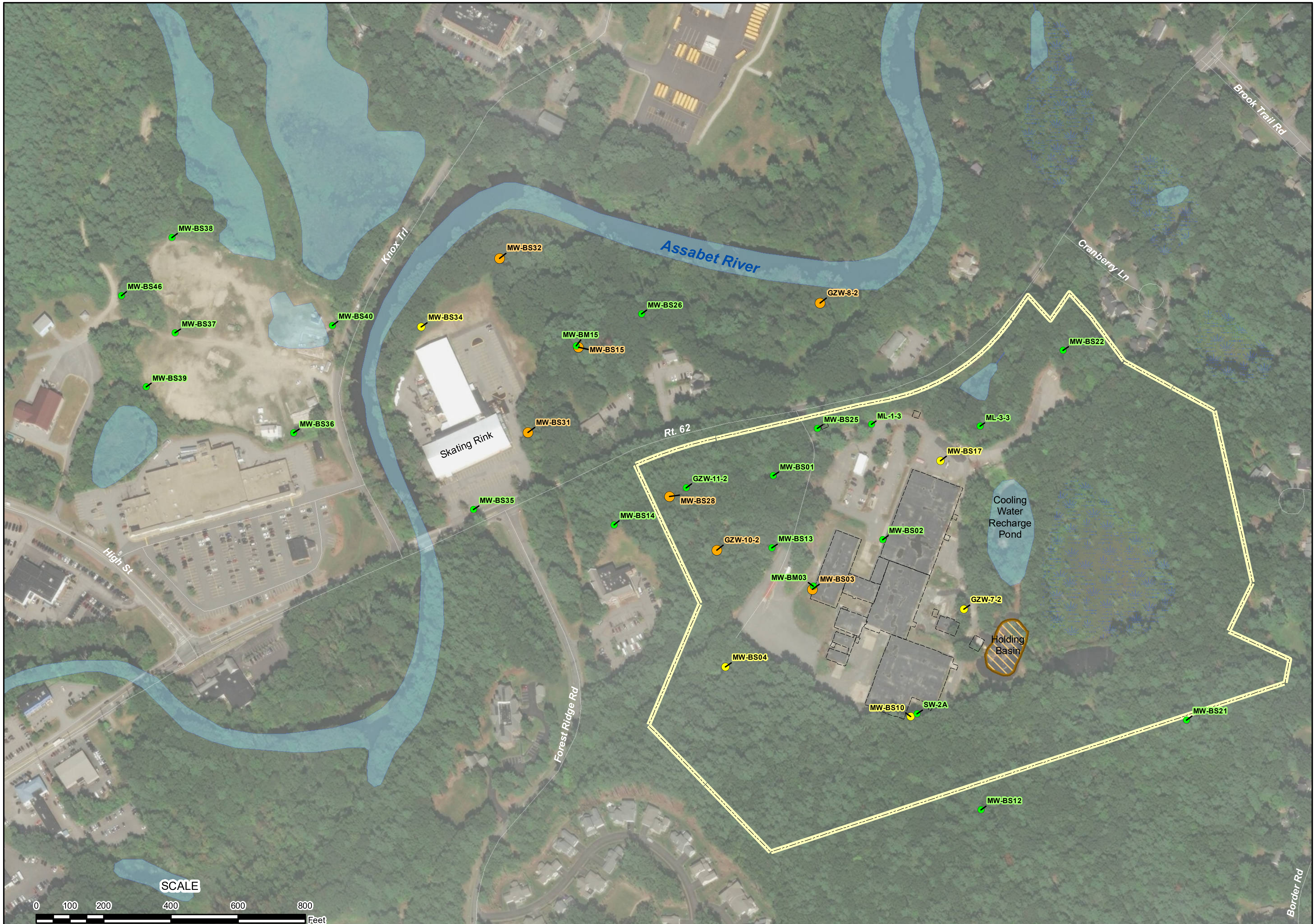
N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms



R:\Projects\DEF\demax-1547\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-10b

Manganese Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (300 ug/l)

Map Legend:

Exceedance Ratios: Manganese in Bedrock ROD Level (300 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :7)
- > 1x (Count :5)
- < Cleanup Level (Count :22)
- ND (Count :0)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

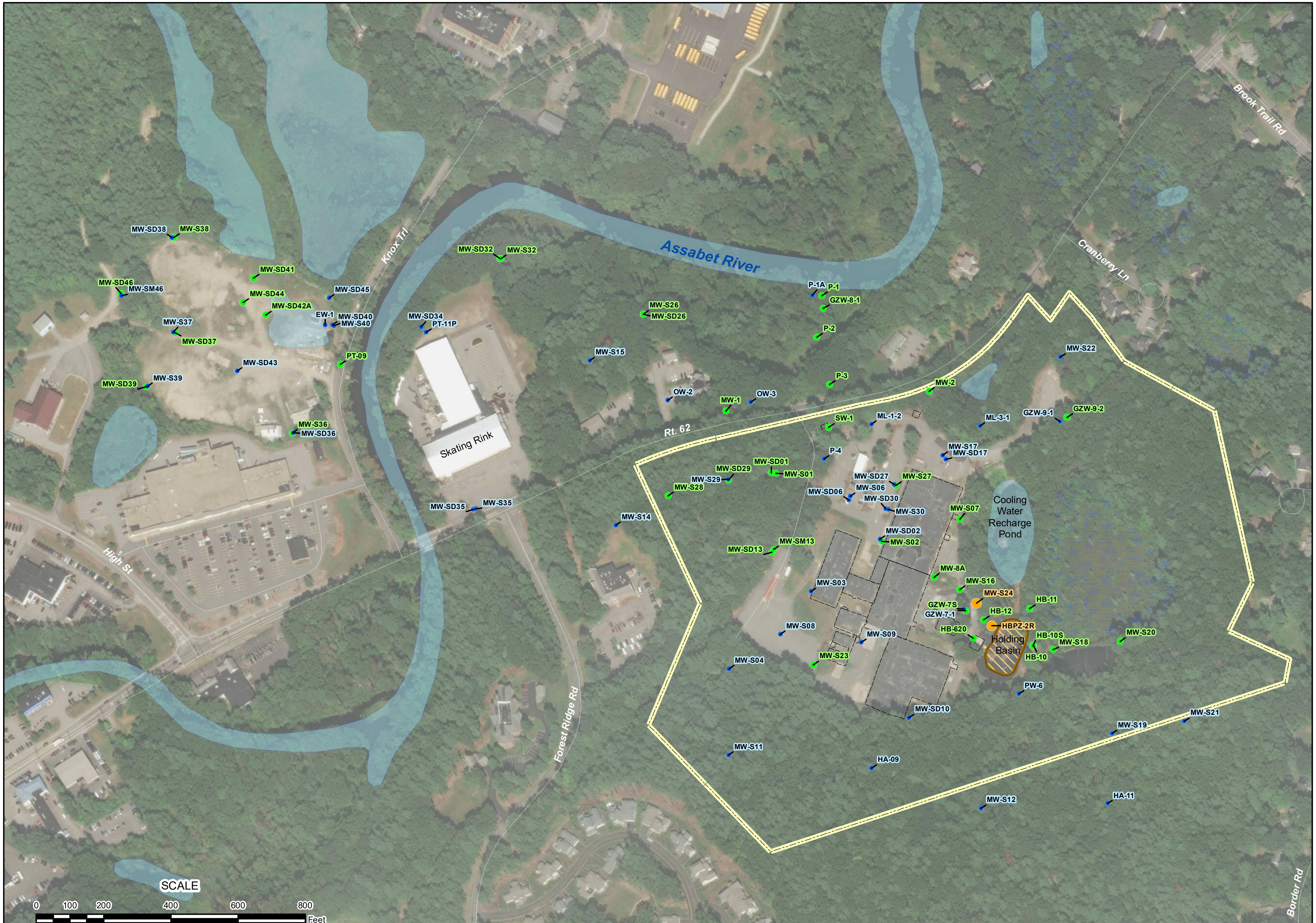


Figure A-11a

Molybdenum Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (100 ug/l)

Map Legend:

Exceedance Ratios: Molybdenum in Overburden ROD Level (100 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :2)
- > 1x (Count :0)
- < Cleanup Level (Count :41)
- ND (Count :46)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-1547\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GIS\Data\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-11b

Molybdenum Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (100 ug/l)

Map Legend:

Exceedance Ratios: Molybdenum in Bedrock ROD Level (100 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :30)
- ND (Count :4)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GIS\Data\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-12a

Thorium Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (0.33 ug/l)

Map Legend:

Exceedance Ratios: Thorium in Overburden ROD Level (0.33 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :7)
- > 1x (Count :0)
- < Cleanup Level (Count :0)
- ND (Count :82)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

Figure A-12b

Thorium Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (0.33 ug/l)

Map Legend:

Exceedance Ratios: Thorium in Bedrock ROD Level (0.33 ug/l)

- > 10x (Count :1)
- > 5x (Count :0)
- > 2x (Count :2)
- > 1x (Count :0)
- < Cleanup Level (Count :0)
- ND (Count :31)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

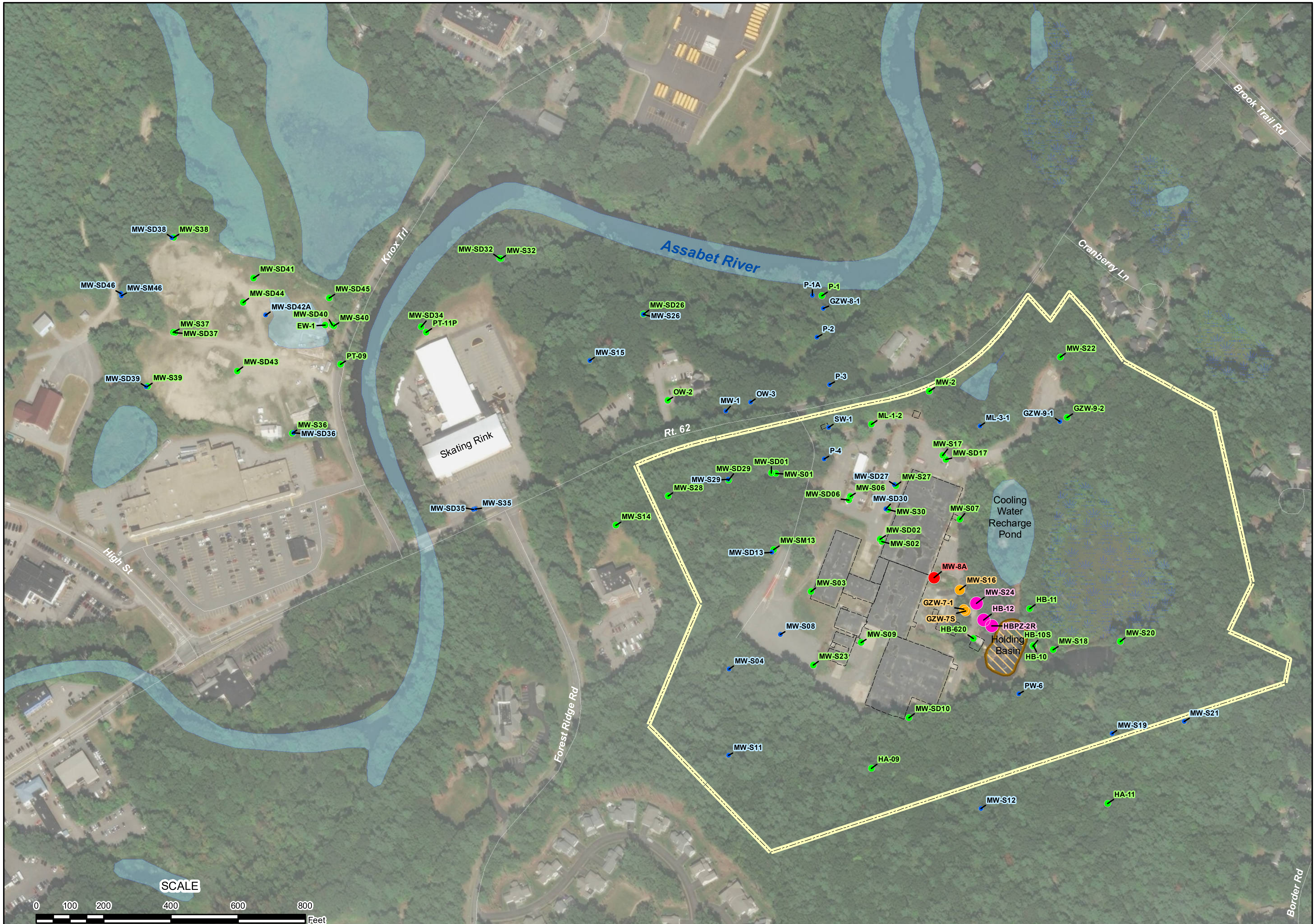
Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GIS\Data\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd



R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-13a

Total Uranium (Depleted) Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (30 ug/l)

Map Legend:

Exceedance Ratios: Total Uranium (Depleted) in Overburden ROD Level (30 ug/l)

- > 10x (Count :3)
- > 5x (Count :1)
- > 2x (Count :3)
- > 1x (Count :0)
- < Cleanup Level (Count :51)
- ND (Count :31)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 04 March, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

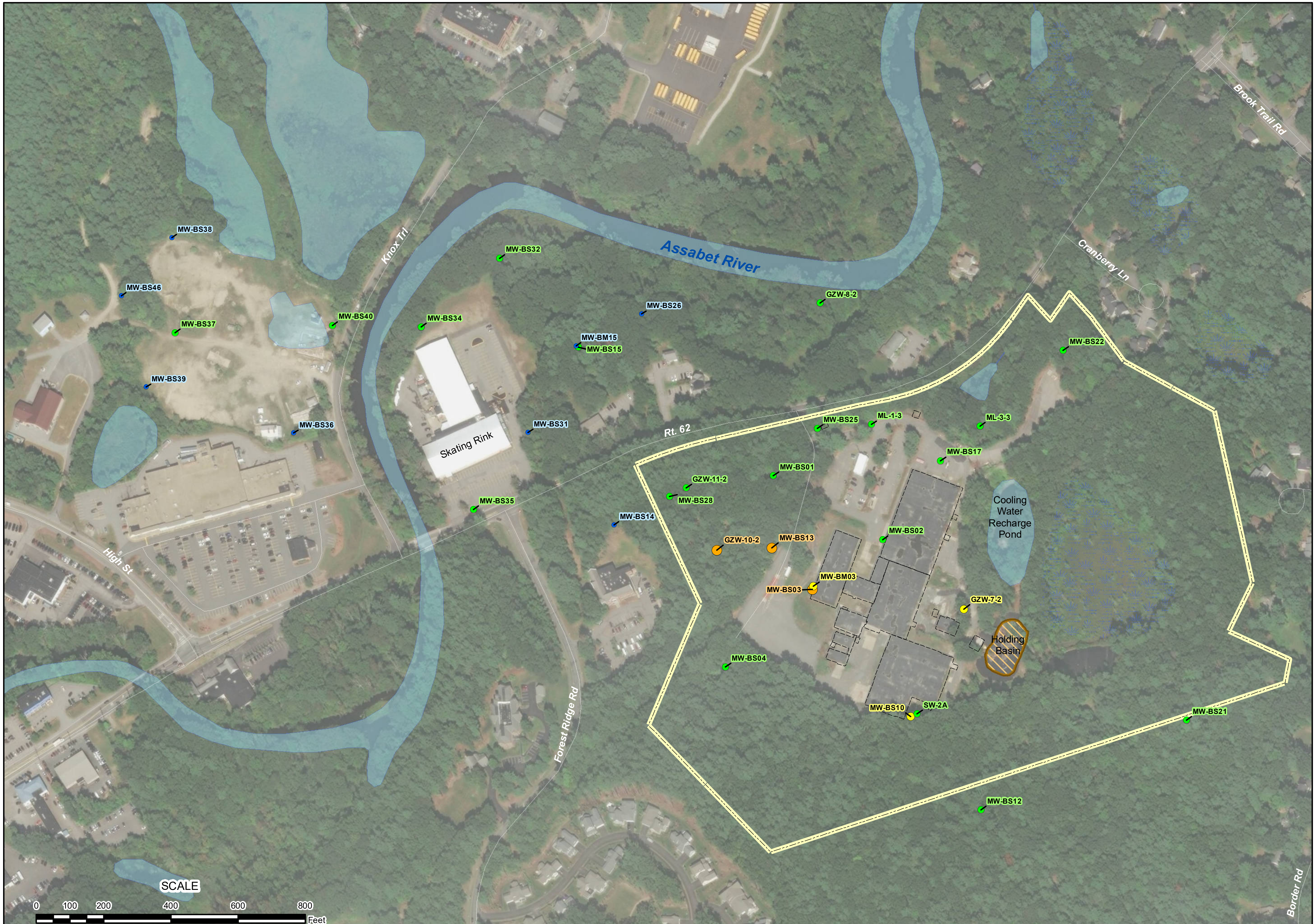


Figure A-14a

Total Uranium (Natural) Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (30 ug/l)

Map Legend:

Exceedance Ratios: Total Uranium (Natural) in Bedrock ROD Level (30 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :3)
- > 1x (Count :3)
- < Cleanup Level (Count :20)
- ND (Count :8)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 04 March, 2020
Arc Operator: LDS
Reviewed by: HG

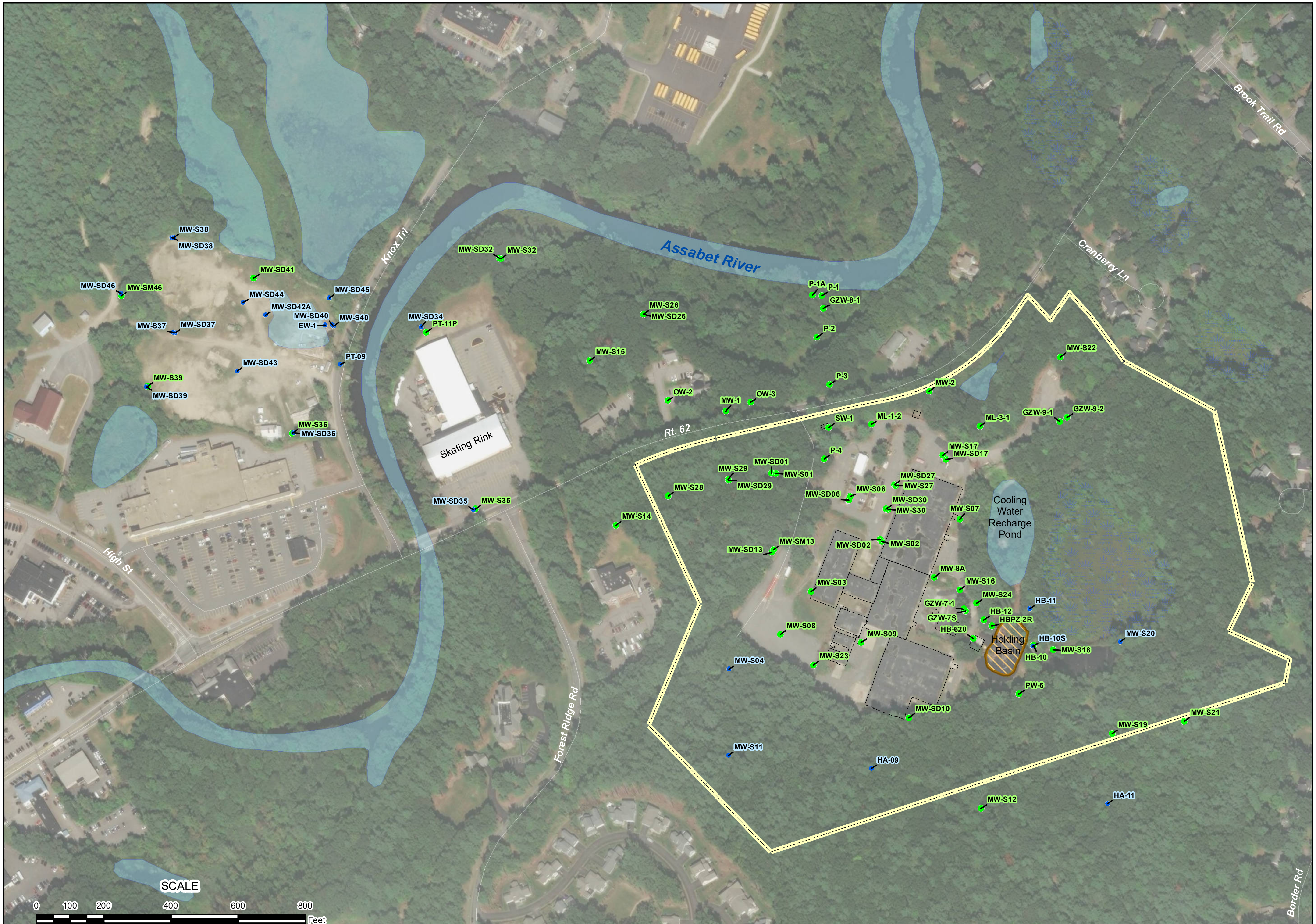
ddms

Figure A-15a

Nitrate as N Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts



Description:

Exceedances based on ROD Level (10000 ug/l)

Map Legend:

Exceedance Ratios: Nitrate as N in Overburden ROD Level (10000 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :65)
- ND (Count :24)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

R:\Projects\DEF\demax-1547\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-15b

Nitrate as N Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (10000 ug/l)

Map Legend:

Exceedance Ratios:
Nitrate as N in Bedrock
ROD Level (10000 ug/l)

- > 10x (Count :0)
- > 5x (Count :1)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :9)
- ND (Count :23)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

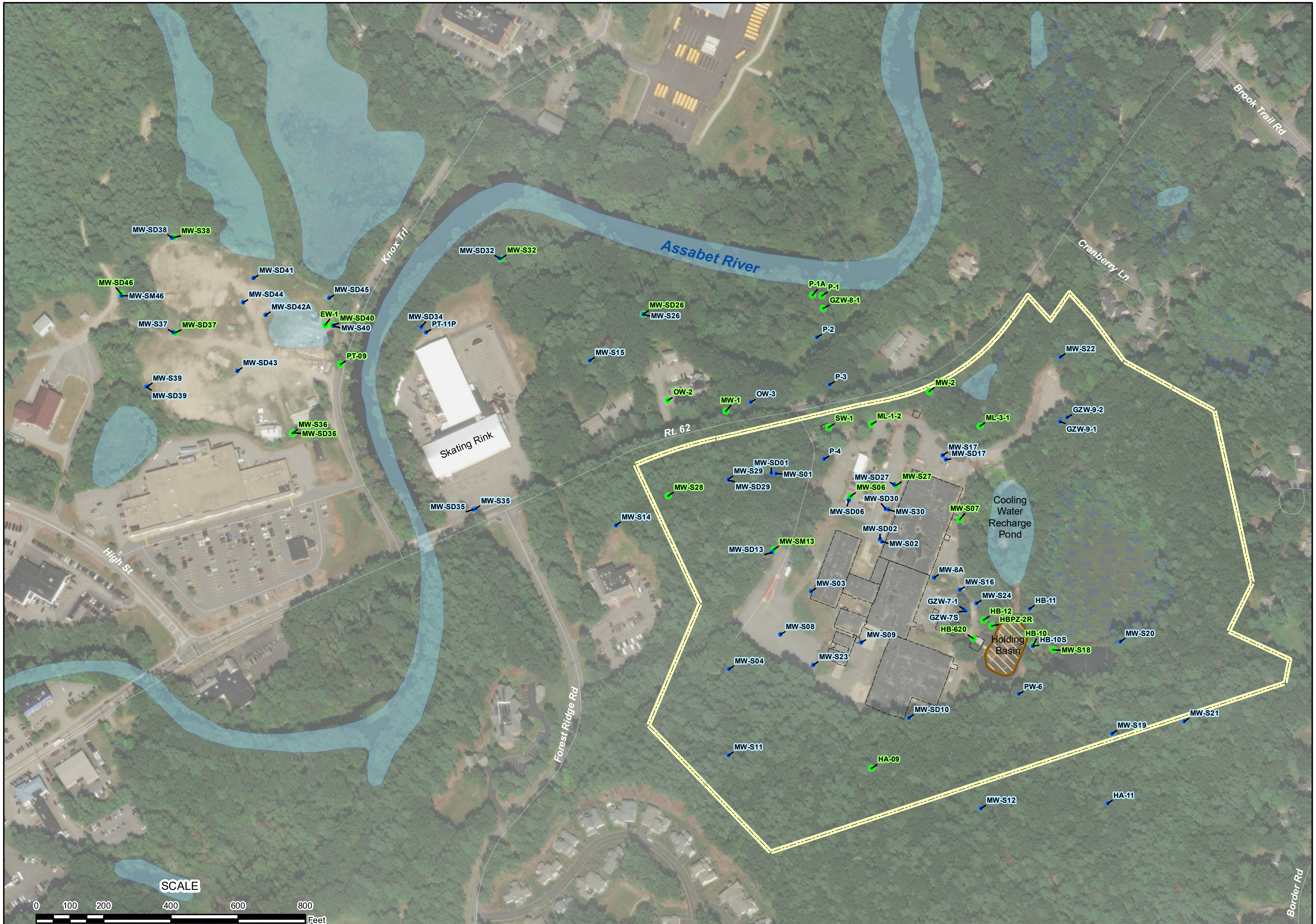
N

Coordinate System:
MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms



R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GIS\Data\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-16a

Nitrite as N Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (1000 ug/l)

Map Legend:

Exceedance Ratios: Nitrite as N in Overburden ROD Level (1000 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :30)
- ND (Count :59)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

Figure A-16b

Nitrite as N Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (1000 ug/l)

Map Legend:

Exceedance Ratios: Nitrite as N in Bedrock ROD Level (1000 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :1)
- > 1x (Count :0)
- < Cleanup Level (Count :9)
- ND (Count :23)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-1547\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

R:\Projects\DEF\demax-1547\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-17a

1,1-Dichloroethane - VISL Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on VISL Level (7.64 ug/l)

Map Legend:

Exceedance Ratios:
1,1-Dichloroethane - VISL in Overburden
VISL Level (7.64 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :9)
- ND (Count :80)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. VISL - Vapor Intrusion Screening Level.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

Figure A-17b

1,1-Dichloroethane Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (2.7 ug/l)

Map Legend:

Exceedance Ratios: 1,1-Dichloroethane in Bedrock ROD Level (2.7 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :3)
- > 1x (Count :1)
- < Cleanup Level (Count :8)
- ND (Count :21)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

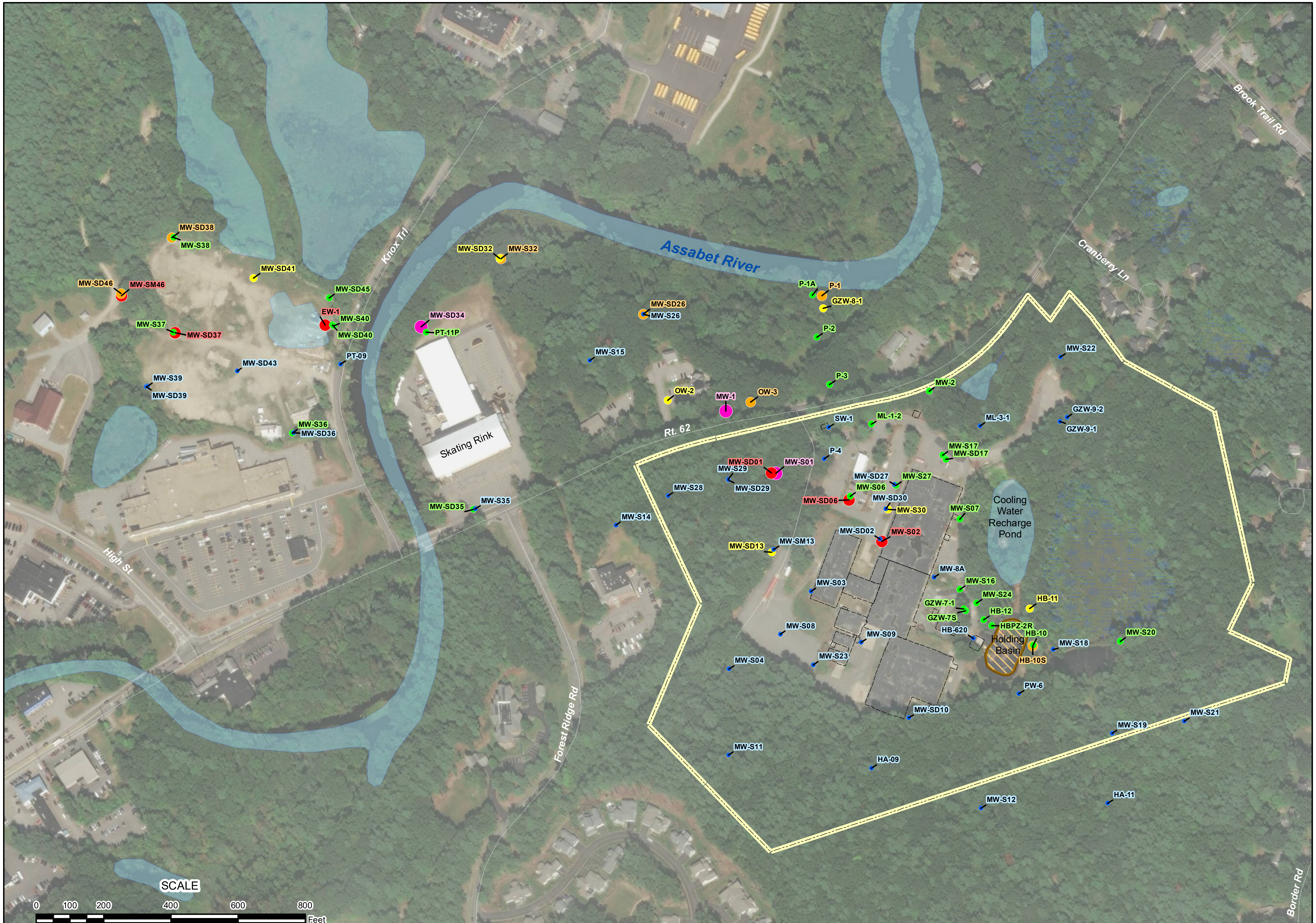
Spatial Projection:

N

Coordinate System: MA State Plane Mainland FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG



R:\Projects\DEF\demax-1547\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-18a

1,4-Dioxane Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (0.46 ug/l)

Map Legend:

Exceedance Ratios: 1,4-Dioxane in Overburden ROD Level (0.46 ug/l)

- > 10x (Count :3)
- > 5x (Count :6)
- > 2x (Count :7)
- > 1x (Count :7)
- < Cleanup Level (Count :26)
- ND (Count :38)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

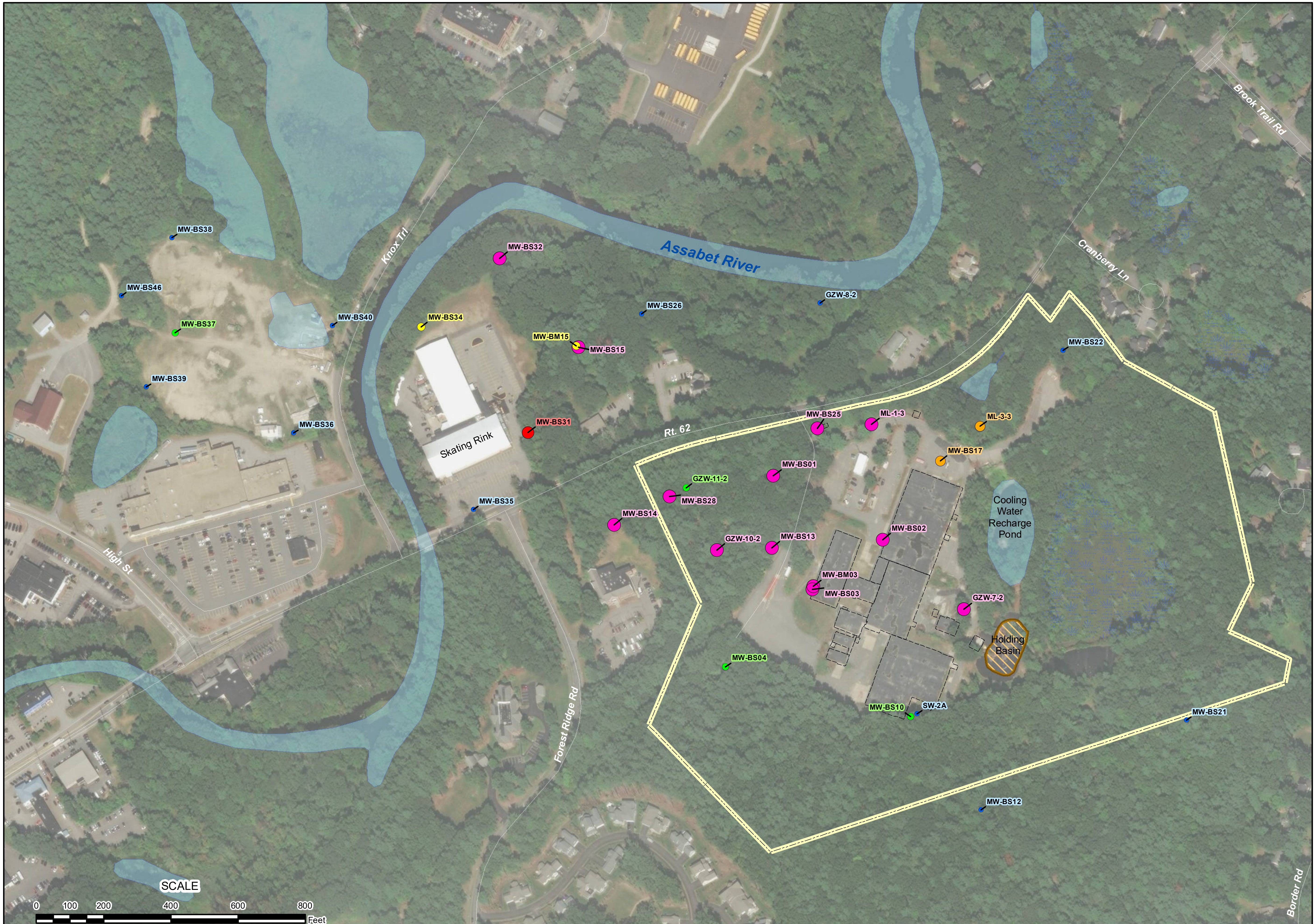


Figure A-18b

1,4-Dioxane Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (0.46 ug/l)

Map Legend:

Exceedance Ratios:
1,4-Dioxane in Bedrock
ROD Level (0.46 ug/l)

- > 10x (Count :13)
- > 5x (Count :1)
- > 2x (Count :2)
- > 1x (Count :2)
- < Cleanup Level (Count :4)
- ND (Count :12)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-1547\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-19a

Bis(2-Ethylhexyl)phthalate Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (6 ug/l)

Map Legend:

Exceedance Ratios: Bis(2-Ethylhexyl)phthalate in Overburden ROD Level (6 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :1)
- < Cleanup Level (Count :8)
- ND (Count :80)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

Figure A-19b

Bis(2-Ethylhexyl)phthalate Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (6 ug/l)

Map Legend:

Exceedance Ratios: Bis(2-Ethylhexyl)phthalate in Bedrock ROD Level (6 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :8)
- ND (Count :25)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

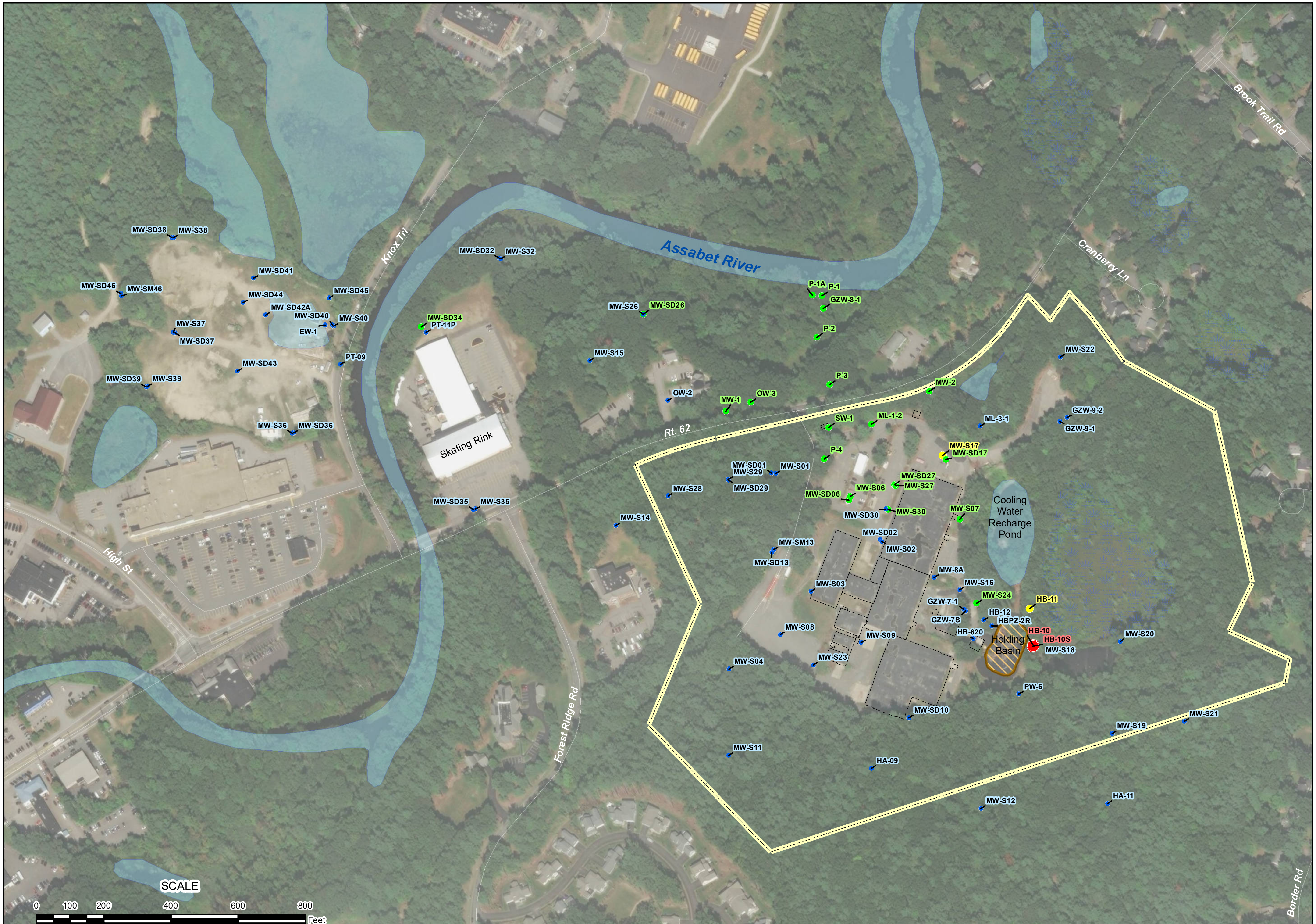
N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms



R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GIS\Data\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-20a

Tetrachloroethylene Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (5 ug/l)

Map Legend:

Exceedance Ratios: Tetrachloroethylene in Overburden ROD Level (5 ug/l)

- > 10x (Count :0)
- > 5x (Count :2)
- > 2x (Count :0)
- > 1x (Count :2)
- < Cleanup Level (Count :21)
- ND (Count :64)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

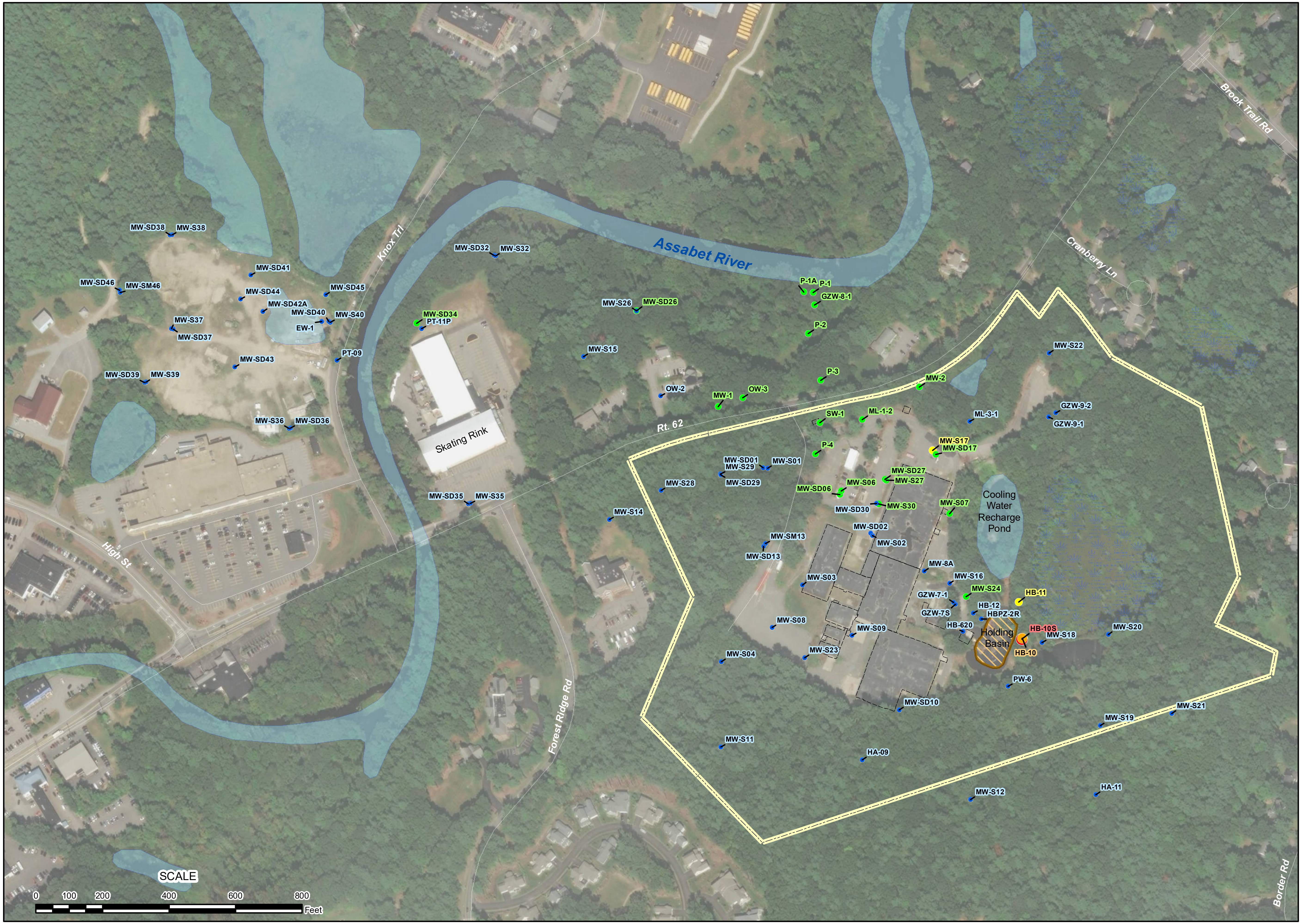
N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms



R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-20b

Tetrachloroethylene - VISL Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on VISL Level (5.76 ug/l)

Map Legend:

Exceedance Ratios: Tetrachloroethylene - VISL in Overburden
VISL Level (5.76 ug/l)

- > 10x (Count :0)
- > 5x (Count :1)
- > 2x (Count :1)
- > 1x (Count :2)
- < Cleanup Level (Count :21)
- ND (Count :64)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. VISL - Vapor Intrusion Screening Level.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

Figure A-20c

Tetrachloroethylene Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (5 ug/l)

Map Legend:

Exceedance Ratios: Tetrachloroethylene in Bedrock ROD Level (5 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :12)
- ND (Count :21)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

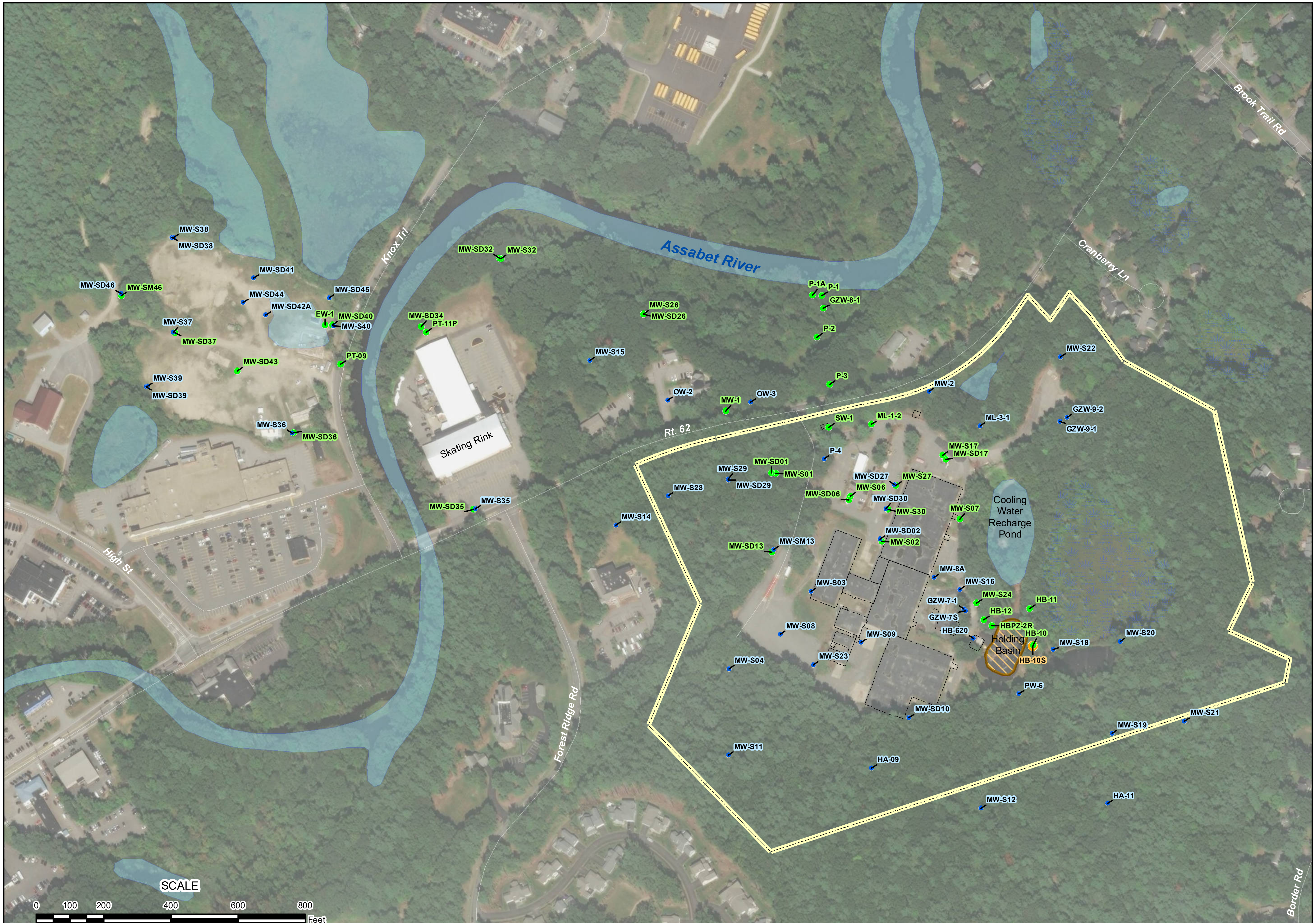


Figure A-21a

Trichloroethene Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (5 ug/l)

Map Legend:

Exceedance Ratios: Trichloroethene in Overburden ROD Level (5 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :1)
- > 1x (Count :0)
- < Cleanup Level (Count :38)
- ND (Count :50)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

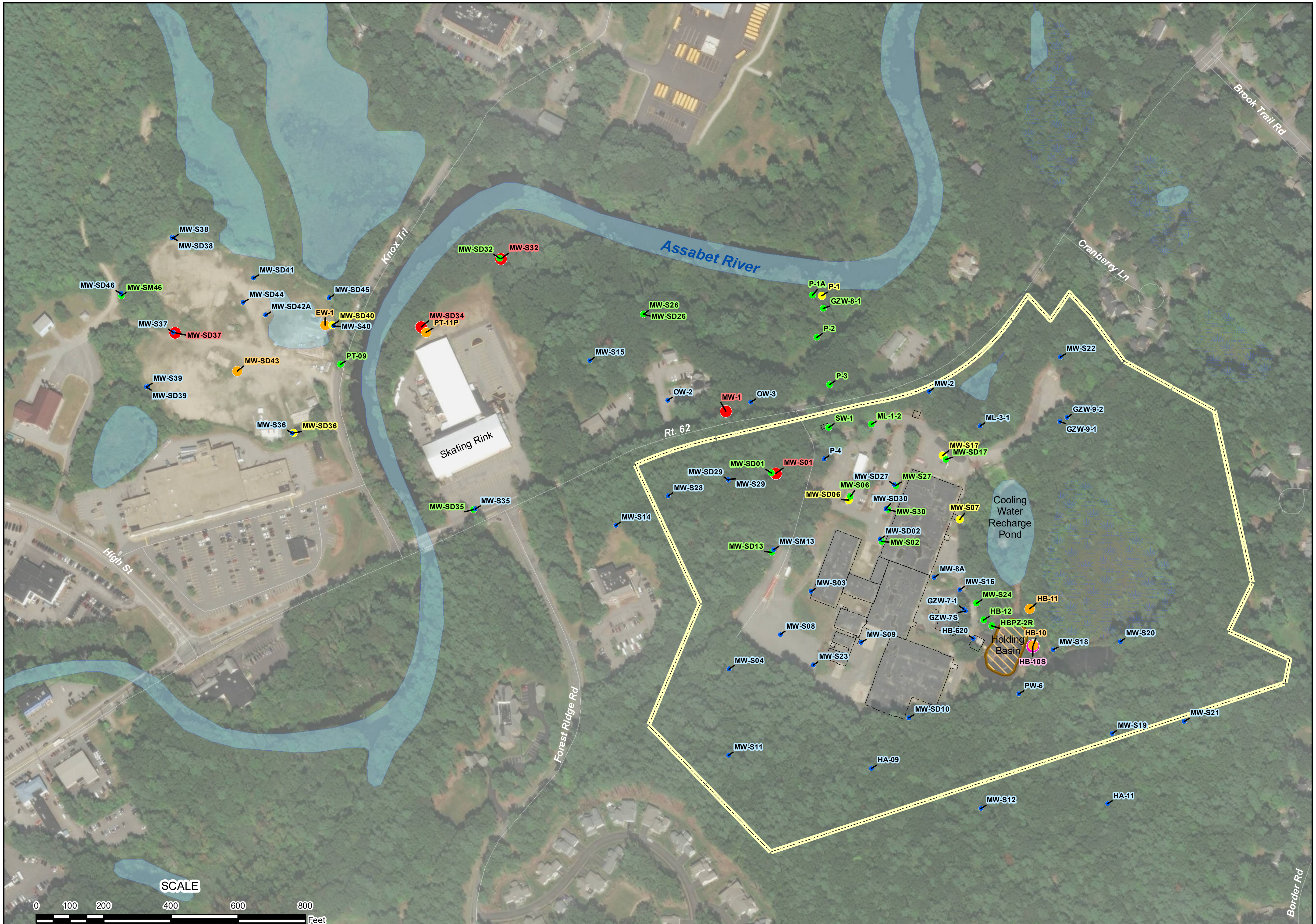


Figure A-21b

Trichloroethene - VISL Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on VISL Level (0.518 ug/l)

Map Legend:

Exceedance Ratios: Trichloroethene - VISL in Overburden
VISL Level (0.518 ug/l)

- > 10x (Count :1)
- > 5x (Count :5)
- > 2x (Count :5)
- > 1x (Count :6)
- < Cleanup Level (Count :22)
- ND (Count :50)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. VISL - Vapor Intrusion Screening Level.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-21c

Trichloroethene Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (5 ug/l)

Map Legend:

Exceedance Ratios: Trichloroethene in Bedrock ROD Level (5 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :17)
- ND (Count :16)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

N

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-1547\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-22a

Vinyl Chloride Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (2 ug/l)

Map Legend:

Exceedance Ratios: Vinyl Chloride in Overburden ROD Level (2 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :5)
- ND (Count :84)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GIS\Data\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-22b

Vinyl Chloride - VISL Exceedance Ratios in Overburden Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on VISL Level (0.147 ug/l)

Map Legend:

Exceedance Ratios:
Vinyl Chloride - VISL in Overburden
VISL Level (0.147 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :2)
- > 1x (Count :2)
- < Cleanup Level (Count :1)
- ND (Count :84)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. VISL - Vapor Intrusion Screening Level.
2. ND - Not detected above laboratory method detection limit.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Figure A-22c

Vinyl Chloride Exceedance Ratios in Bedrock Groundwater

November 2019

Nuclear Metals Inc.
(Remedial Design/Remedial Action)
Concord, Massachusetts

Description:

Exceedances based on ROD Level (2 ug/l)

Map Legend:

Exceedance Ratios: Vinyl Chloride in Bedrock ROD Level (2 ug/l)

- > 10x (Count :0)
- > 5x (Count :0)
- > 2x (Count :0)
- > 1x (Count :0)
- < Cleanup Level (Count :2)
- ND (Count :31)
- Site Boundary
- Former Building Concrete Foundations

Notes:

1. ROD - Record of Decision.
2. ND - Not detected above laboratory method detection limit.
3. MCL - Maximum Contaminant Level.

Spatial Projection:

N

Coordinate System: MA State Plane Mainland
FIPS Zone: 2001
Units: US Survey Feet
Datum: NAD83

Plot Info:

Project No.: 3243
Plot Date: 21 February, 2020
Arc Operator: LDS
Reviewed by: HG

ddms

R:\Projects\DEF\demax-15471\3243-NMI GW NTCRA\DataAnalysis\GISData\Projects\Sample_Event_Maps\Sitewide_Sample_Event_2019\Report_Figs\FigA_Nov2019_GroundwaterSamplingResults.mxd

Attachment B

Pressure Transducer Installation Log

TRANSDUCER INSTALL RECORD

Geosyntec consultants
289 Great Road
Acton, MA 07120
Phone: 978-263-9588, Fax 978-263-9594

Project Name: Nuclear Metals Inc. Superfund Site Date ________ Page ______ of ______
Project Number: BR0090 Primary Activities: ________
Field Personnel: ________
Recorded By: ________
Weather: ________

Well	Measuring Point Elevation (ft)	Measuring Point Description	Depth to GW (ft)	Groundwater Elevation (ft)	Depth to Bottom (ft)	Height of Water In Well (ft)

Well	Install Date	Transducer			Install Depth (ft)	Height of Water Above Transducer (ft)	Does Height Exceed PSI	1.0 ft Check
		Model/Type	Serial #	PSI				