

Nuclear Metals, Inc. Site Concord and Acton, MA

U.S. EPA | HAZARDOUS WASTE PROGRAM AT EPA NEW ENGLAND



THE SUPERFUND PROGRAM protects human health and the environment by investigating and cleaning up often-abandoned hazardous waste sites and engaging communities throughout the process. Many of these sites are complex and need long-term cleanup actions. Those responsible for contamination are held liable for cleanup costs. EPA strives to return previously contaminated land and groundwater to productive use.

INTRODUCTION:

A multi-phase cleanup is underway at the 46-acre Nuclear Metals, Inc. (NMI) Site, located at 2229 Main Street in Concord, MA. Under EPA and Massachusetts Department of Environmental Protection (MassDEP) oversight, an action to empty, demolish site buildings and remove all materials for off-site disposal was completed in September 2016. A second action to control migration of Volatile Organic Compounds (VOCs) and 1,4-dioxane contaminated groundwater started in July 2016. These actions are being performed by the Respondents (two companies that owned the site prior to September 1972), with significant financial support from settling federal agencies (that contracted with NMI).

BACKGROUND:

From 1957 to October 1972, NMI was owned and operated by a succession of companies that engaged in specialty research. In September 1972, NMI employees purchased the operation and shifted focus to large-scale production of depleted uranium (DU) armor penetrators, other DU products, and beryllium alloy parts. NMI was renamed as "Starmet Corporation" in 1997. Manufacturing operations resulted in significant contamination of equipment and to the interior of the buildings, as well as to soil, sediment, and groundwater at the 46-acre property. The Site was placed on the National Priorities List in June 2001, triggering further investigation and interim or "removal" actions by EPA and MassDEP. To date, removal actions placed interim covers on the "Holding Basin" and "Old Landfill" areas (2001), installed perimeter fencing (2002), removed DU drums and

other materials from the buildings for off-site disposal (2005-2007), removed hazardous and flammable materials from the buildings for off-site disposal (2008), and removed all remaining contents from the buildings prior to demolishing them, with off-site disposal of all materials (2011-2016).

PUBLIC INFORMATIONAL MEETING

Nuclear Metals, Inc. Superfund site Thursday, May 25, 2017 - 6:30 pm

Acton Town Hall, 472 Main Street
Room 204, Acton, MA

The meeting space is fully accessible, if you have any questions or special needs, please call Sarah White, EPA Community Involvement Coordinator at 617-918-1026. white.sarah@epa.gov

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A comprehensive investigation of the extent of contamination (the “Remedial Investigation” or “RI”) and evaluation of remedial alternatives (the “Feasibility Study” or “FS”) began in 2004 and was completed in 2015. In September 2015, EPA issued a “Record of Decision” (ROD) selecting a \$125 million remedy for the site. The ROD generally includes the following components:

- Excavation and off-site disposal of approximately 82,500 cubic yards of contaminated concrete, asphalt, soil and sediment.
- In-situ stabilization of DU contaminated soils in the Holding Basin using apatite injection.
- Extraction and ex-situ treatment of groundwater for volatile organic compounds (VOCs) and 1,4-dioxane.
- In-situ treatment of DU in overburden groundwater and natural uranium in bedrock groundwater (these plumes are within the 2229 Main Street property).
- Long-term monitoring to monitor the effectiveness of in- and ex-situ treatment.
- Institutional Controls to prevent disturbance of the Holding Basin area, prevent the use of Site groundwater, and address potential vapor intrusion risks.

The ROD also addressed acceleration of the remedy component addressing extraction and treatment of groundwater impacted by VOCs and 1,4-dioxane, as those contaminants pose a threat to municipal water supply wells. This accelerated process is termed the Groundwater Non-Time-Critical Removal Action or “Groundwater NTCRA.”

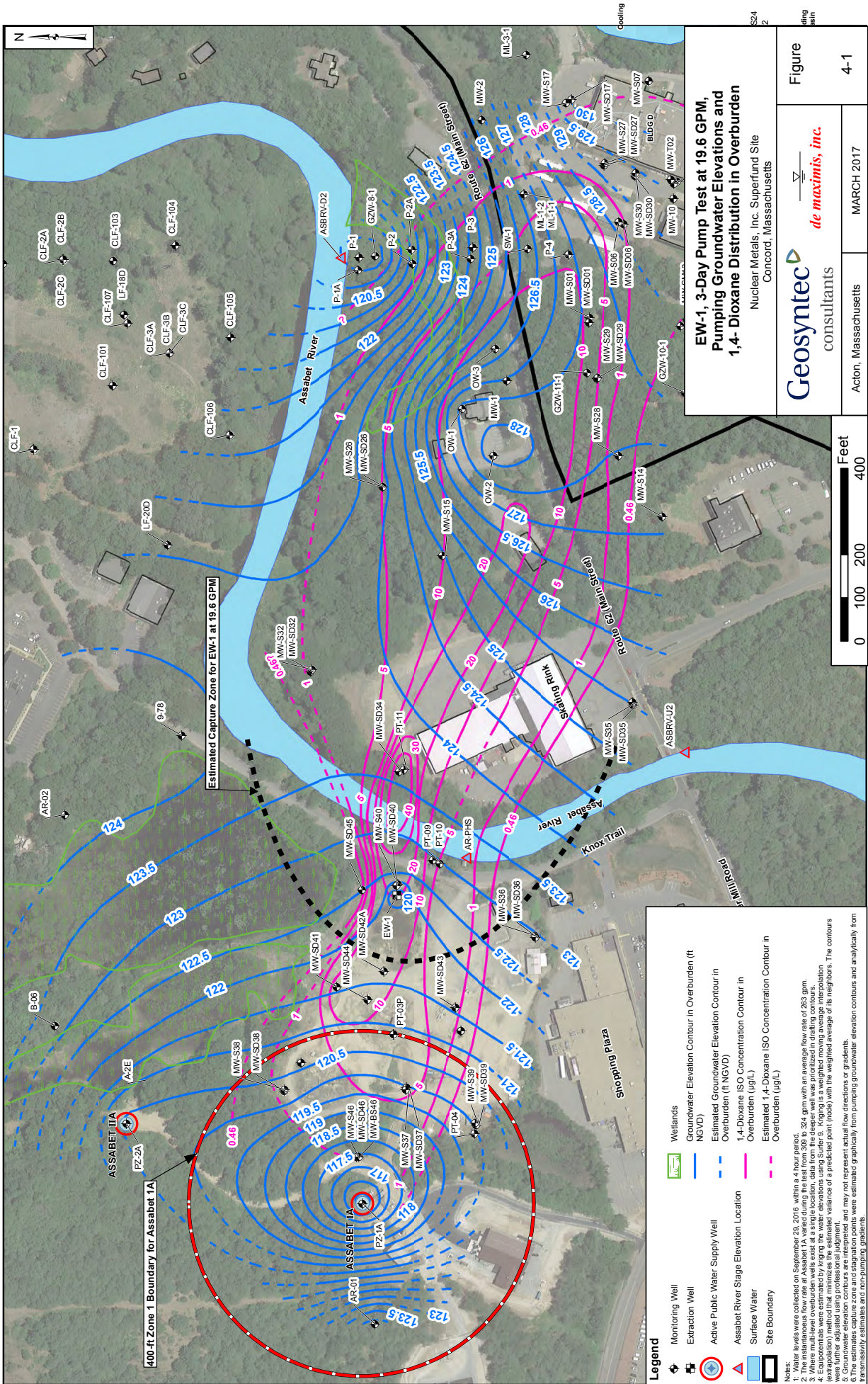
BUILDING NON-TIME-CRITICAL REMOVAL ACTION (NTCRA):

During the RI/FS, EPA determined that the site buildings presented an unacceptable risk, which resulted in an August 2011 Administrative Order with the Respondents and Settling Federal Agencies that funded a \$70 million project to empty and demolish the site buildings, and transport all those materials for off-site disposal. That project started in November 2011, when the Starmet entities vacated the facility.

Building contents and non-load bearing walls were removed, interior surfaces cleaned, and rooftop equipment removed prior to starting building demolition. The building’s slab foundations were covered by a temporary liner which will remain in place until excavation begins during the Remedial Action (RA). This work was completed \$15 million under budget, due to the project team’s efforts to manage the various waste streams and competitively procure transportation and disposal, and resulted in significant savings on those costs, which was the single largest line item in the NTCRA budget.

GROUNDWATER NTCRA:

Work to better understand the extent of the VOC and 1,4-dioxane contamination in groundwater started before the ROD was issued. The risk-based acceptable concentration levels and laboratory detection limits for 1,4-dioxane decreased several times during the RI/FS process, each time expanding the area of study. The project team recognized that the final FS sampling program was inadequate to bound the extent of 1,4-dioxane to the ROD cleanup level of 0.46 ug/L (parts per billion). A work plan to determine the extent of the problem was submitted to EPA in August 2015, and led to the installation and sampling of 29 new groundwater monitoring wells and sampling of 16 existing wells between September 2015 and January 2016. All analysis for 1,4-dioxane was performed to an analytical detection limit of 0.15 ug/L. Coordination with Acton Water District allowed the NMI team to perform water elevation monitoring during a planned March 2016 “shut down” of two Acton municipal water supply wells (Assabet 1A and 2A). These data helped the team to better understand how pumping from these wells affects the flow of groundwater. This understanding was incorporated into the July 2016 Extraction Well Installation and Pump Test Work Plan. On July 7, 2016, EPA issued an Administrative Settlement Agreement and Order on Consent with the Respondents and Settling Federal Agencies for the payment and performance of the Groundwater NTCRA. The agreement specifies the actions required to install a groundwater pumping and treatment system to cut off the 1,4-dioxane and VOC contamination before it gets to the Assabet 1A Municipal Supply Well.



**EW-1, 3-Day Pump Test at 19.6 GPM,
Pumping Groundwater Elevations and
1,4-Dioxane Distribution in Overburden**

Nuclear Metals, Inc. Superfund Site
Concord, Massachusetts

Geosyntec consultants
de maximis, inc.

Figure 4-1
Acton, Massachusetts MARCH 2017

Legend

- Monitoring Well
- Extraction Well
- Active Public Water Supply Well
- Assabet River Stage Elevation Location
- Surface Water
- Site Boundary
- Wetlands
- Groundwater Elevation Contour in Overburden (ft NGVD)
- Estimated Groundwater Elevation Contour in Overburden (ft NGVD)
- Assabet River Stage Elevation Location
- Surface Water
- Site Boundary
- Wetlands
- Groundwater Elevation Contour in Overburden (ft NGVD)
- Estimated Groundwater Elevation Contour in Overburden (ft NGVD)
- 1,4-Dioxane ISO Concentration Contour in Overburden (µg/L)
- Estimated 1,4-Dioxane ISO Concentration Contour in Overburden (µg/L)

Notes:

- Water levels were collected on September 29, 2016, within a 4-hour period.
- The instantaneous flow rate at Assabet 1A varied during the test from 309 to 324 gpm with an average flow rate of 263 gpm.
- Where multi-level overburden wells exist at a single location, data from the deeper well was prioritized in drafting contours.
- Estimated contours were generated using the inverse distance weighting (IDW) method. The contours were further adjusted using professional judgment.
- Groundwater elevation contours are interpreted and may not represent actual flow directions or gradients.
- Estimated 1,4-dioxane contours were estimated graphically from pumping groundwater elevation contours and analytically from transmissivity estimates and non-pumping gradients.

In August and September 2016, an extraction well was installed on Acton Water District property (the former gravel plant at 16 Knox Trail), along with additional monitoring wells. Following installation of the extraction well, various tests were performed to determine the capacity and flow rate from the well necessary to capture the NMI-related VOC and 1,4-dioxane contamination (See Figure above). Following these tests, the project team proceeded to install a temporary treatment system (that was previously constructed for the now complete Building NTCRA) to cut off the migration of contamination to the Assabet 1A supply well while the design and installation of the final treatment system is completed. The temporary system, installed in April 2017, will capture the contaminated groundwater, remove the VOCs, and discharge the treated water to the Assabet River. In parallel with the design and installation of the Temporary System, a Treatability Study Work Plan has been developed.

The intent of this Treatability Study is to evaluate various technologies and select the best available technology for the treatment of 1,4-dioxane in the final treatment system. Selection of the final technology is scheduled to be made during the summer of 2017, and will be followed by final design and installation of a final Groundwater Treatment System. The available treatment options for 1,4-dioxane are complex systems, which will take several months to design and construct once selected. A new building will also need to be constructed to house the final system. Construction of the final Groundwater Treatment System is expected to extend into the winter of 2017/2018. EPA sent notice letters to the Respondents and Settling Federal Agencies in September 2016 initiating negotiations for performance of the remaining components of the remedy established in the ROD, and these negotiations are currently on-going.



building demolition



Nuclear Metals building cap completion