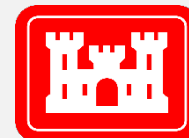


U.S. Army Corps of Engineers  
Formerly Used Defense Sites Program



FINAL PROPOSED PLAN

Hingham Naval Ammunition Depot

Hingham, Plymouth, and Norfolk Counties, Massachusetts

Formerly Used Defense Site Project Numbers: D01MA002204, D01MA002205, D01MA002206, D01MA002207, D01MA002208, and D01MA002209

February 2021

*Text in bold italics indicates that a word or phrase is included in the glossary at the end of this Proposed Plan.*

INTRODUCTION AND PURPOSE

The U.S. Army Corps of Engineers (USACE) is presenting this ***Proposed Plan*** to allow the public the opportunity to review and comment on the proposed decision for No Action for ***munitions constituents*** or ***munitions and explosives of concern*** at the former Hingham Naval Ammunition Depot ***Munitions Response Sites*** (Sites) and to encourage community participation in the environmental process. These ***Formerly Used Defense Sites*** are located approximately 15 miles south of Boston and comprise 991 acres of land and water in, and surrounding, the Weymouth Back River in Hingham, Plymouth, and Norfolk Counties, Massachusetts (refer to Figure 1 on the following page). The majority of the property is owned by the towns of Hingham and Weymouth, operated by the Bare Cove Park Committee and used for recreational purposes as Bare Cove Park and Great Esker Park. Other stakeholders include governing agencies such as Massachusetts Division of Fisheries and Wildlife and Department of Public Works; various landowners such as Hingham Mutual Life Insurance Co., Hingham Property Trust, and several other developers and smaller landholders; and abutters to the former Hingham Naval Ammunition Depot. The proposed future use of the Sites is recreational. Based on the findings of the ***Remedial Investigation*** under the ***Military Munitions Response Program*** and previous studies, the USACE has determined there is no unacceptable risk to human health or the environment from ***munitions*** or ***munitions constituents*** (i.e., the chemicals associated with munitions and explosives) associated with the Hingham Naval Ammunition Depot Formerly Used Defense Sites.

This Proposed Plan provides a brief description of the Remedial Investigation. It also provides the basis for supporting the No Action decision. The USACE will review and consider the information submitted during the public comment period. The USACE may modify its proposed decision for No Action based on new

IMPORTANT DATES AND LOCATIONS

Public Comment Period:

March 01, 2021 – March 31, 2021

The USACE will accept comments on the Proposed Plan during the public comment period. Please submit your comments by: emailing [Gina.A.Kaso@usace.army.mil](mailto:Gina.A.Kaso@usace.army.mil), calling 978-318-8180, or mailing:

Ms. Gina Kaso  
USACE, New England District  
Attn: CENAE-PP  
696 Virginia Road  
Concord, Massachusetts 01742

Comments received by 5 PM March 31, 2021, or postmarked by that day, will be reviewed and considered. Oral and written comments will be accepted at the virtual public meeting.

Public Meeting:

The USACE will present the Proposed Plan at a virtual public meeting on March 16, 2021 at 6 PM EST.

Presentation and Virtual Meeting Microsoft Teams Application link will be available at town of Hingham website (<https://www.hingham-ma.gov/810/Naval-Ammo-Depot>) and the town of Weymouth website (<https://www.weymouth.ma.us/>)

For more information and to view project documents, see the **Administrative Record** file at the following locations:

Hingham Public Library  
66 Leavitt Street  
Hingham, Massachusetts 02043

Tufts @ Pratt Library  
46 Broad Street  
Weymouth, Massachusetts 02188

information or public comments. Therefore, the public is encouraged to review and comment on the proposed decision for No Action presented in this Proposed Plan.

The USACE is required under the **Comprehensive Environmental Response, Compensation, and Liability Act** to issue this Proposed Plan and seek public comment and participation under Section 300.430(f)(2) of the **National Oil and Hazardous Substances Pollution Contingency Plan**. The fieldwork for the Remedial Investigation, which began in April 2018 and was completed by January 2020, forms the basis for the Proposed Plan recommendation. This Proposed Plan summarizes information that can be found in greater detail in the Remedial Investigation reports for the Formerly Used Defense Sites and other project documents available for review at the Hingham Public Library located at 66 Leavitt Street, Hingham, Massachusetts, the Tufts @ Pratt Library located at 46 Broad Street, Weymouth, Massachusetts, the town of Hingham's website: <https://www.hingham-ma.gov/810/Naval-Ammo-Depot>, and the town of Weymouth's website: <https://www.weymouth.ma.us/>.

## PUBLIC INVOLVEMENT PROCESS

Community members and other interested parties are encouraged to review this Proposed Plan and submit comments (see text box on first page). The USACE will consider public comments on the proposed decision for No Action before making a final determination for the former Hingham Naval Ammunition Depot.

The Army is the lead agency for the Formerly Used Defense Sites Program. The USACE, on behalf of the Army and the Department of Defense, is the executing agent for the program and is responsible for environmental restoration of Formerly Used Defense Sites Program eligible properties as required by law. The USACE is responsible for investigating, reporting, and implementing remedial action related to Department of Defense activities at the former Hingham Naval Ammunition Depot.

The Massachusetts Department of Environmental Protection is the lead regulator, and the Town of Hingham and the Town of Weymouth are the stakeholders for this Remedial Investigation. Representatives from the Massachusetts Department of Environmental Protection and the Towns of Hingham and Weymouth have been involved in the Remedial Investigation. The Massachusetts Department of Environmental Protection has reviewed the final Remedial Investigation Reports for the six Sites and had no comments or had all comments addressed by USACE. The Massachusetts Department of Environmental Protection and the Towns of Hingham and Weymouth support the proposed decision for No Action.

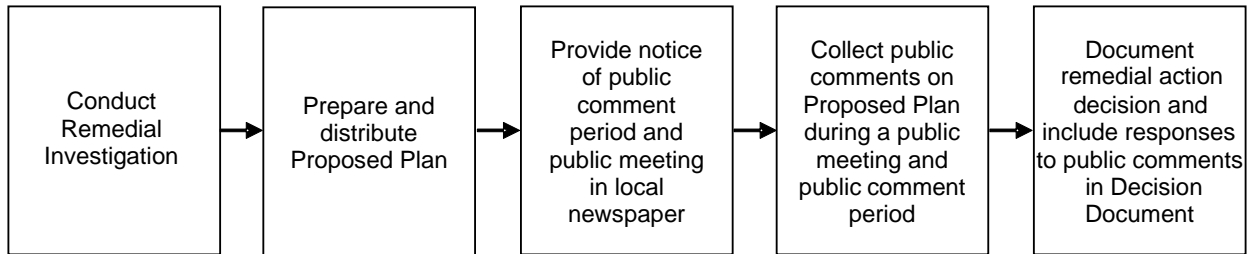
The Remedial Investigation reports for each Site are part of the **Administrative Record** file that contains the documents used in making decisions for the former Hingham Naval Ammunition Depot. The Administrative Record file is available for review at the Hingham Public Library located at 66 Leavitt Street, Hingham, Massachusetts, and the Tufts @ Pratt Library located at 46 Broad Street, Weymouth, Massachusetts. Additionally, the complete Administrative Record, along with a more detailed repository of documents, is located at the USACE' Headquarters Office at 696 Virginia Road, Concord, Massachusetts.

This Proposed Plan identifies and provides the basis for the proposed decision for No Action. The purposes of this Proposed Plan are to:

- Provide information about the Sites, Site history, and current and future use.
- Identify and describe the proposed decision for No Action and explain the information supporting it.
- Encourage public review and comment on the proposed decision for No Action.
- Provide information on how the public can be involved in the decision process.

The USACE will present its final decision in the **Decision Document**. Responses to public comments on this Proposed Plan will appear in the "Responsiveness Summary" section of the Decision Document. The flow chart shown below as Figure 1 summarizes the various steps in the development and approval process for the former Hingham Naval Ammunition Depot Decision Document.

**Figure 1: Public Participation Process**



## **SITE BACKGROUND AND CHARACTERISTICS**

### **Site Location and History**

The former Hingham Naval Ammunition Depot is located in Plymouth and Norfolk Counties, Massachusetts in the towns of Hingham and Weymouth, respectively. The Hingham Naval Ammunition Depot was comprised of 991 acres of land and water in, and surrounding, the Weymouth Back River, as shown on Figure 2. In 1903, Congress selected the site for the establishment of a Naval Magazine based on the recommendation of the Navy. Acquisition of the land began in 1906 and was initially completed in 1913 through condemnation and purchase. The Navy used the Hingham Naval Ammunition Depot as a munitions manufacturing and testing plant to supply ordnance to ships and aircraft primarily during the preparation and engagement of World Wars I and II and expanded the Depot throughout those years. Peacetime operations were similar and included the manufacturing of practice ammunition for the fleet, overhaul of service ammunition, and maintenance and demilitarization of unserviceable ammunition. The Navy's construction of the buildings and other improvements began in 1909. The property was closed in 1960 and reported to General Services Administration for disposal in 1962. General Services Administration has since conveyed the acreage in part to the towns of Weymouth and Hingham and other stakeholders and private developers by deed for varying considerations. No portions of the former depot are now under control of the Department of Defense.

The area is surrounded by low-density residential housing and commercial areas, and Hingham Harbor to the north. The Formerly Used Defense Sites are not fenced and are accessible to the public for recreational purposes as Bear Cove Park and Great Esker Park. The parks are currently used for daily/regular recreation, including fishing, hiking, dog walking, biking, bird watching, and boating. Boating activities include power boating, kayaking, and canoeing within the Weymouth Back River.

Hingham Naval Ammunition Depot supports estuarine and marine deepwater wetlands, as well as estuarine and marine wetlands, freshwater emergent wetlands, freshwater forested/shrub wetlands, freshwater ponds, and riverine wetlands, which provide habitat for a wide variety of biota. The Hingham Naval Ammunition Depot includes areas identified under the Coastal Zone Management Act, as portions of the Formerly Used Defense Sites are within the State of Massachusetts Coastal Management Zone. The Weymouth Back River is designated as a Massachusetts Area of Critical Environmental Concern (designated by the Department of Conservation and Recreation), and tidal marsh wetlands comprise the majority of the Formerly Used Defense Sites.

There are six Sites located within the former Hingham Naval Ammunition Depot which were used from 1911 to 1961 (Figure 2). These six Sites were included as part of the Remedial Investigation and are addressed under this Proposed Plan. The individual site profiles and historical information are summarized below.

- The 1.8-acre North Pier was used for transportation of packaged ammunition.
- The 1-acre Dump Area is on a steep bank on the edge of the Weymouth Back River. It was used for the disposal of solid waste, including munitions and explosives of concern (which may include **munitions debris**) and range-related materials.
- The 3.5-acre South Pier was used for transportation of packaged ammunition.

- The 3-acre Furnace Area is located between the North and South Piers Sites. The Site consisted of a small building that housed a “popping” furnace used for disposal of unserviceable and unused munitions. The building has been demolished, but the foundation and other structural items remain at the Site.
- The 8.2-acre Burial Area was used for the disposal of solid waste, including munitions and explosives of concern (which may include munitions debris) and range-related materials.

The 133-acre Weymouth Back River (comprised of 109 open water acres and 24 land acres) consists of a portion of the Weymouth Back River except areas overlapping the North Pier, South Pier, and the Furnace Area. The Site was used for transportation of packaged ammunition. The Site is recognized as a public waterway between the towns of Hingham and Weymouth.

## **Previous Investigations**

The USACE completed a series of investigations at the Hingham Naval Ammunition Depot (“Site”) to determine the potential presence of munitions and munitions constituents following the Comprehensive Environmental Response, Compensation, and Liability Act process, including the following:

- Initial Inventory Project Report (1993)
- 1996 Archives Search Report (1996)
- Site Inspection (2008)
- Revised Inventory Project Report (2014)

The Inventory Project Report, completed in 1993, concluded that the former Hingham Naval Ammunition Depot was formerly used by the Department of Defense and eligible for the Defense Environmental Restoration Program for Formerly Used Defense Sites program. The Inventory Project Report concluded that the former Hingham Naval Ammunition Depot required further investigation for munitions and explosives of concern and associated munitions constituents.

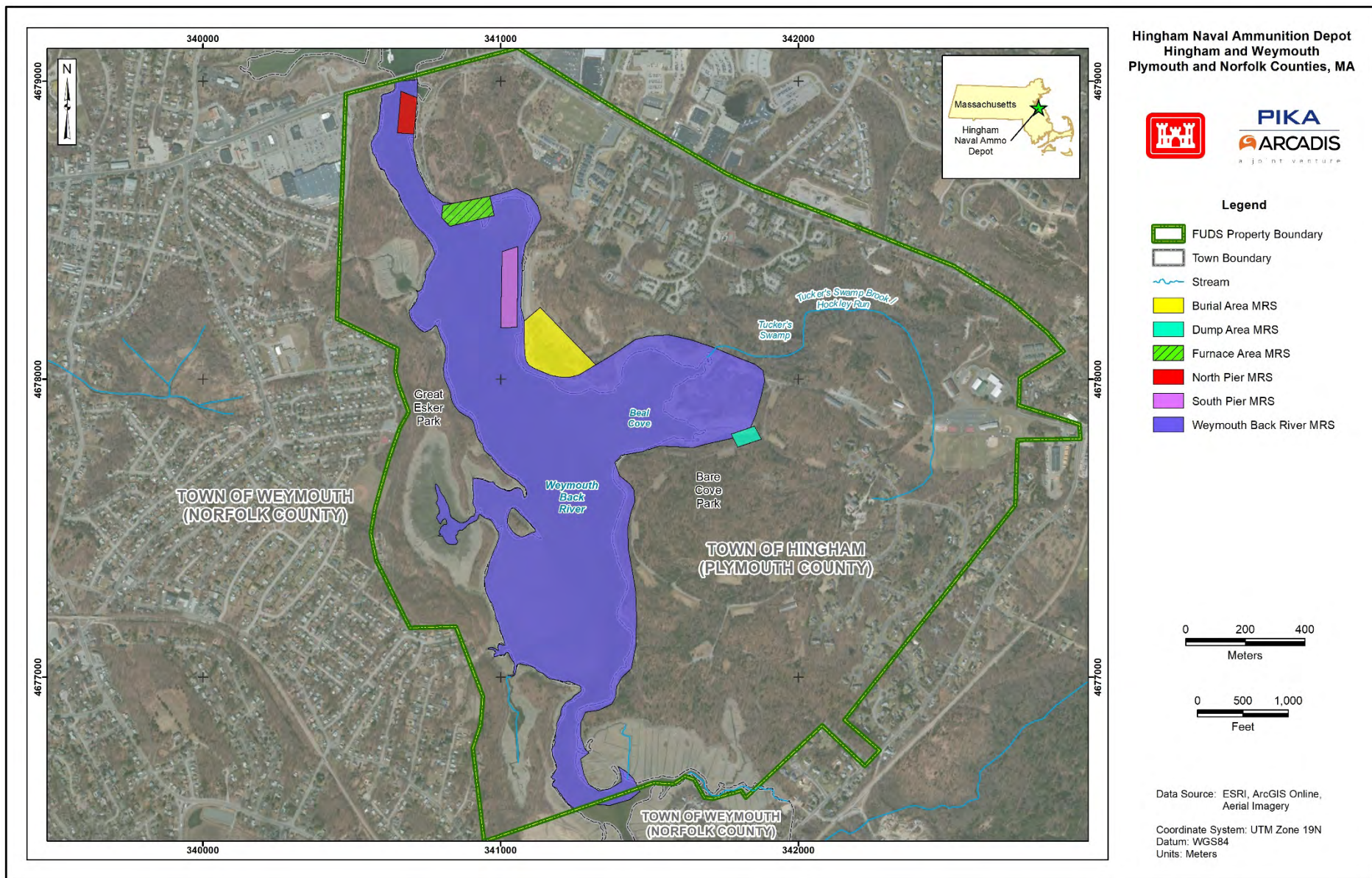
The USACE completed the Archives Search Report in 1996 after reviewing reports, newspaper articles, historical documents, reference material available that documented the history of the former Hingham Naval Ammunition Depot, and the on-site visual inspection. This report is the source of most of the historical information pertaining to Site activities.

A Site Inspection was performed in 2008 to confirm the presence or absence of munitions and explosives of concern at the former Hingham Naval Ammunition Depot and associated munitions constituents. It included a visit and investigation of munitions and explosives of concern as well as the associated munitions constituents (i.e., chemicals associated with munitions and explosives) to determine the nature and extent as well as whether any further action was warranted. The Site Inspection recommended a Remedial Investigation at the former Hingham Naval Ammunition Depot to include geophysical characterization for potential munitions and explosives of concerns and munitions constituents sampling, if warranted.

The 2014 Revised Inventory Project Report was primarily an administrative change; it revised the description of the sites at the former Hingham Naval Ammunition Depot from “project sites” to “Munitions Response Sites” as mandated by Department of Defense guidance.



Figure 2: Hingham Naval Ammunition Depot



## REMEDIAL INVESTIGATION

The objective of the Remedial Investigation at the former Hingham Naval Ammunition Depot was to characterize the nature and extent of munitions and explosives of concern and munitions constituents and to assess the potential risk and hazards to human health, safety, and the environment arising from potential munitions and explosives of concern and/or munitions constituents.

The investigation focused on determining the types and concentrations of munitions and munitions constituents on land and in the water within the six Sites at the former Hingham Naval Ammunition Depot as identified in by the Site Inspection:

- North Pier – northern end of the Weymouth Back River (1.8 acres of water);
- Dump Area – steep bank on eastern edge of the Weymouth Back River (1 acre on land);
- South Pier – dilapidated remnants of pier located on eastern side of the Weymouth Back River (3.5 acres of water);
- Furnace Area – remnants of building and other structural items located between North and South Pier Sites (3 acres on land);
- Burial Area – eastern edge of Weymouth Back River (8.2 acres of land); and
- Weymouth Back River – portions of the Weymouth Back River except areas overlapping the North Pier, South Pier, and Furnace Area (24 acres on land; 109 acres of water).

### Munitions and Explosives of Concern

Land and water areas required different survey methods due to varying site conditions. Data was collected using the following survey methods:

- **Digital geophysical mapping** surveys using cart-mounted equipment on land and boat-mounted equipment along transects in the water areas; and
- Analog surveys using hand-held metal detectors on the land and in the nearshore areas not accessible to the digital geophysical mapping survey team. Analog surveys were used instead of digital geophysical mapping surveys on land in areas of steep terrain. Analog surveys were also used in areas near the piers and shallow water areas that were not accessible to the boat mounted equipment.
- The geophysical team used a Global Positioning System receiver to reacquire each **anomaly** selected for intrusive investigation.

#### **North Pier**

A combination of digital geophysical mapping and analog surveys were conducted across the North Pier. The geophysical investigations involved 100% coverage digital geophysical mapping surveys of approximately 1.80 acres of accessible areas. Analog surveys were conducted in approximately 0.03 acres inaccessible to the digital geophysical mapping survey team (e.g., gap in the northeastern corner of the Site, gap in the center-southern portion of the Site, resulting from proximity to the piers and shallow water less than 2 feet in depth).

A total of 112 targets were selected for intrusive investigation using the Hypergeometric method of anomaly prioritization and two additional targets were detected and intrusively investigated during the analog survey. No munitions or explosives of concern were found at the Site. All investigated anomalies were identified as non-munitions related debris, small arms, range-related debris, other (geologic noise or a co-located target), quality control seeds (used as an accuracy performance measure), or false positives (i.e., no contact). Munitions debris items that were identified during the Remedial Investigation field activities at the North Pier included expended, empty, and badly corroded 40-millimeter cartridge casings. These were located at nine target locations, including two locations where multiple munitions debris were recovered. Due to bridge closure restrictions and insufficient safe space on the boat for the inspection and storage of numerous material potentially presenting an explosive hazard, additional empty 40-millimeter cartridge casings were

inspected underwater, characterized as munitions debris, and left in place at the two locations with multiple munitions debris recovered. Once each location was characterized, the intrusive investigation team continued to the next anomaly. A total of 20 pounds of munitions debris, 16 pounds of range-related debris, and 2,070 pounds of non-munitions related debris were recovered during the investigation activities. Munitions debris and non-munitions related debris were inspected and certified as free from explosives. North Pier munitions and explosives of concern investigation results are shown on Figure 3.

Fifteen empty 40-millimeter cartridge casings which were badly corroded from saltwater immersion were recovered. These items were not characterized as munitions debris indicative of munitions and explosives of concern because there has been no evidence of 40-millimeter projectiles (practice or high explosive), cartridge casings with remaining propellant or primers, or complete rounds. Based on the fact only barges and small boats were used at Hingham Naval Ammunition Depot, the 40-millimeter fixed ammunition would have had to been fired from a cannon on a Navy ship in open water and the expended cartridges casing returned to Hingham Naval Ammunition Depot for disposal.

### ***Dump Area***

A combination of digital geophysical mapping and analog surveys were conducted across the Dump Area. The geophysical investigation involved 100% coverage digital geophysical mapping surveys of approximately 0.74 acres of accessible areas. Analog surveys were conducted in approximately 0.04 acres of area inaccessible to the digital geophysical mapping survey team (e.g., steep terrain). The balance of approximately 0.23 acres could not be surveyed due to steep terrain, water, or roads.

A total of 179 anomalies were selected for intrusive investigation. A total of five test pits were intrusively investigated in saturated response areas (when the response is so high over an area that the data becomes saturated and makes target selection impossible). No munitions and explosives of concern items were found at the Site. All investigated anomalies were identified as non-munitions related debris, other, or false positives (i.e., no contact). A total of 1,565 pounds of non-munitions related debris was recovered from the digital geophysical mapping and analog survey intrusive investigations and another 285 pounds of non-munitions related debris was recovered from test pit investigation activities. Dump Area munitions and explosives of concern investigation results are shown on Figure 4.

### ***South Pier***

A combination of digital geophysical mapping and analog surveys were conducted across the South Pier. The geophysical investigation involved 100% coverage digital geophysical mapping surveys of approximately 3.12 acres of accessible areas. Analog surveys were conducted in approximately 0.43 acres of area inaccessible to the digital geophysical mapping survey team (e.g., areas near the piers, shallow water less than 2 feet in depth).

A total of 51 anomalies were selected for intrusive investigation from the digital geophysical mapping survey and an additional 18 anomalies were selected for intrusive investigation from the analog survey. No munitions and explosives of concern, or munitions debris indicative of munitions and explosives of concern, were found at the Site. All investigated anomalies were identified as non-munitions related debris, other, or false positives (i.e., no contact). A total of 257 pounds of non-munitions related debris were recovered as part of the anomaly investigation. South Pier munitions and explosives of concern investigation results are shown on Figure 5.

### ***Furnace Area***

A combination of digital geophysical mapping and analog surveys were conducted across the Furnace Area. The geophysical investigation involved 100% coverage digital geophysical mapping surveys of approximately 2.02 acres of accessible areas. Analog surveys were conducted in approximately 0.68 acres of area, inaccessible to the digital geophysical mapping survey team (e.g., presence of a road, steep banks adjacent to the road and steep slopes along the tidal marsh areas). 0.3 acres of intertidal sediment within the Furnace Area were inaccessible (i.e., deep soft sediment and fast-moving currents and tides) and could not be surveyed.

A total of 255 digital geophysical mapping discrete anomalies were intrusively investigated, plus an additional ten test pit locations were intrusively investigated in saturated response areas. Heavy machinery was used to remove any overburden and surface debris in the saturated response areas and the unexploded ordnance

technicians used analog instruments to remove any metal by hand. No munitions and explosives of concern or munitions debris items were found at the Site. All investigated anomalies were identified as non-munitions related debris, other, or false positives (i.e., no contact). A total of 2441.6 pounds of non-munitions related debris was recovered from the Furnace Area and disposed of. Furnace Area munitions and explosives of concern investigation results are shown on Figure 6.

### **Burial Area**

A digital geophysical mapping survey was conducted across the Burial Area. The geophysical investigation involved transect surveys of approximately 3.6 kilometers (2.23 miles) of the Site followed by intrusive investigation of test pits in areas with elevated anomalous detections.

A total of 26 test pits were selected, of which only 25 test pits were excavated and investigated, as one test pit, Test Pit 10, was not excavated because of the presence of an asphalt road. No munitions and explosives of concern or munitions debris items were discovered as part of the test pit investigations. All items recovered from the test pits were identified as non-munitions related debris, other, or false positives (i.e., no contact). A total of 1,843 pounds of non-munitions related debris was recovered from the test pit investigation activities and disposed of. Burial Area munitions and explosives of concern investigation results are shown on Figure 7.

### **Weymouth Back River**

The geophysical investigation conducted across the Weymouth Back River was delineated into land and water components, which required different survey methodologies due to the varying site conditions. The geophysical investigation involved a combination of digital geophysical mapping transect surveys in the land and water environments and analog transect surveys in the land and water.

The digital geophysical mapping surveys covered approximately 14.52 acres (13.47 acres of the water and 1.05 acres of land) at the Weymouth Back River Site. The analog surveys covered approximately 1.53 acres (1.21 acres of the water and 0.32 acres of land). The digital geophysical mapping and analog transect surveys together covered approximately 16.05 acres (or 21.75 miles) across the entire Site (land and water). A total of 136 anomalies on land and 96 anomalies underwater were selected for intrusive investigation. No unexploded ordnance items were found at the Site. All investigated anomalies were identified as either material documented as safe, non-munitions related debris, other, or false positives (i.e., no contact). Weymouth Back River munitions and explosives of concern investigation results are shown on Figure 8.

One material documented as a safe item, an empty and badly corroded MK1 MOD1 Submarine Float Signal M69 weighing less than one pound, was identified during the field activities at the Weymouth Back River in the water environment. These findings confirm previous site documentation that indicated that this was the primary munitions type transported at the Site. A large amount of non-munitions related debris was also found during the intrusive investigation at the Weymouth Back River Site, consisting of mostly scrap metal (i.e., railroad spikes, rebar, boat anchors) and a single civilian pistol (non-**military munitions** related). The pistol was turned over to the local police department who was on site at the time. Material documented as safe and non-munitions related debris were inspected and certified as free from explosives and de-milled (cut up) and disposed of offsite. A total of 2,103 pounds of non-munitions related debris was recovered from the intrusive investigation activities.

### **Munitions Constituents**

Munitions constituents sampling, in conjunction with the munitions and explosives of concern intrusive investigation, was used to characterize nature and extent of munitions constituents at the former Hingham Naval Ammunition Depot. Soil and sediment samples were collected in predetermined locations. For the purpose of this document, soil samples are referred to samples collected on land and sediment samples are referred to samples collected in or near water. Additionally, groundwater samples were collected from three wells installed at the Furnace Area Site. Based on the specific munitions constituents sampling approach at each Site, samples were collected at predetermined locations selected to support a statistically valid sampling approach. Sampling would have been conducted at locations of breached munitions and explosives of concern; however, no munitions and explosives concern were identified. Analytes/analytical groups were munitions-specific based on the types of munitions potentially present within the six Sites at the former Hingham Naval Ammunition Depot. The following analytes/analytical groups were selected:



- Explosives
- Select munitions constituents metals (aluminum, antimony, barium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, strontium, and zinc)
- Simultaneously extracted metals/acid-volatile sulfide
- Dioxins and furans
- Perchlorate (groundwater only)

While not specifically related to munitions constituents, dioxins and furans were selected for analyses as these substances are formed during the burning of munitions. Simultaneously extracted metals/acid-volatile sulfide analyses were conducted to provide an indication of the toxicity of metals in sediment for benthic organisms. Additionally, a subset of samples were analyzed for total organic carbon, grain size, and pH to assist with evaluating fate and transport.

Additionally, background soil and sediment sampling for munitions constituents was done to distinguish Department of Defense-related metal contamination from other sources of metal contamination (native and anthropogenic). Samples were collected within the Formerly Used Defense Sites boundaries in areas where the soil and sediment types are consistent with those of the Furnace Area, Burial Area, and Dump Area and in areas determined not to have been impacted by munitions-related activities. Sediment samples were also collected outside the Formerly Used Defense Sites boundaries in areas where sediment type is consistent with that of the North Pier, South Pier, Furnace Area, Burial Area, and in areas believed not to have been impacted by munitions-related activities. The background samples were collected at the same depths and sampling methods as the primary samples. The background sample locations are shown on Figures 9 through 11. The background soil and background sediment samples were analyzed for the same analysis as the primary samples.

### **North Pier**

Sediment samples were collected from 20 sample locations at discrete intervals and arranged in an unbiased grid pattern within the North Pier. Samples were collected at discrete intervals to a maximum depth of 4 feet, segmented into surficial intervals (0-0.5 feet) and subsurface intervals (0.5-2 feet and 2-4 feet) (29 total samples). An additional 26 step-out sediment samples were collected to delineate the extent of explosives present in sediment in the vicinity of one sample location where detections exceeded screening levels as well as around the two locations with multiple munitions debris recovered.

For surface sediment samples, the maximum detected concentrations of aluminum, chromium, iron, mercury, and manganese exceed screening values; however, they are less than the applicable background threshold values. The maximum detected concentrations of copper, lead, nickel, and zinc exceed both screening values and the background threshold values; however, based on the two-sample hypothesis tests that compared the mean site and background concentrations, there was insufficient evidence to conclude site concentrations were different from background concentrations. 2,4-Dinitrotoluene and 2,6-dinitrotoluene were each detected in one surface sediment sample. The remaining explosive sample results were all non-detect. Twenty-six additional step-out sample results were also all non-detect for all explosives. For subsurface sediment samples, no explosive constituents were detected. The maximum detected concentrations of chromium, copper, lead, mercury, and zinc exceed screening values; however, they are less than the applicable background threshold values. The maximum detected concentrations of aluminum, iron, manganese, and nickel exceed both screening values and the background threshold values. However, comparisons based on two-sample hypothesis testing indicate that the means of the two datasets for each constituent are equal. Therefore, it can be reasonably concluded that these concentrations in sediment reflect background conditions. North Pier munitions constituents sediment investigation results are shown on Figure 12.

### **Dump Area**

Surface and subsurface soil samples were collected at 20 discrete locations (samples collected at two depths). No explosives were detected in any of the surface or subsurface soil samples. Aluminum, chromium, iron, and manganese were each detected in all, or nearly all samples above the human health screening

level. Antimony was detected in one sample above the ecological screening level, and chromium, copper, lead, manganese, mercury, nickel, and zinc were each detected in multiple samples above ecological screening levels. Of the ten metals that exceeded human health or ecological screening levels, only antimony, chromium, copper, and lead were also detected at concentrations above the background threshold values. However, concentrations of chromium and lead only exceed background threshold values in one of the 40 samples collected; and copper marginally exceeds the background threshold values in five of the 40 samples. Comparisons based on two-sample hypothesis testing indicates that means of the two datasets (i.e., site and background) for both antimony and lead are equal, and the site mean is less than the background mean for chromium. For copper, the two-sample hypothesis test indicates that the site mean is greater than the background mean, the concentrations in five of 40 samples only marginally exceed the background threshold values. Therefore, the metals detected are present at concentrations consistent with the background. Dump Area munitions constituents soil investigation results are shown on Figure 13.

### **South Pier**

Surface sediment samples were collected at 20 locations and subsurface sediment samples were collected at five locations (at two depths). Aluminum, chromium, iron, and manganese were each detected in all samples above the human health screening level, and zinc was detected in four out of the 30 samples above the human health screening level. Human health screening levels for chromium are for hexavalent chromium. This is a conservative approach since although hexavalent chromium is more toxic than trivalent chromium, hexavalent chromium is typically present at most locations as a fraction of total chromium (e.g., in some areas, it has been reported that one-sixth the amount of total chromium may be hexavalent chromium) and the actual proportion of trivalent chromium / hexavalent chromium at this Site is unknown. There are no exceedances of the trivalent chromium value of 12,000 milligrams per kilogram. Chromium, copper, iron, lead, mercury, nickel, and zinc were each detected in all of the samples above ecological screening values. Of the nine metals that exceeded human health or screening levels, only chromium was detected above the background threshold values. However, concentrations of chromium exceeds the background threshold values in two of the 30 samples (both subsurface). If indicative of historical munitions as the source, it is more likely that multiple munitions constituents would be present at elevated concentrations (e.g., explosives might also be detected in samples and other metals such as iron and lead associated with the same munitions would more frequently exceed background). Since many metals (i.e., aluminum, chromium, copper, iron, lead, manganese, mercury, nickel, and zinc) in background sediment samples also exceed the human health and/or ecological screening levels, further statistical evaluation to differentiate between naturally occurring metals that are also common munitions constituents metals and metals concentrations associated with historical munitions use was performed. Concentrations of several metals at the Site exceed screening levels and background; however, two sample hypothesis testing indicates means for site data are below the background means. Since relatively few individual samples exceed the background threshold values, and as no sources for munitions constituents were identified at the South Pier, these are likely attributable to local conditions, such as natural variability or other sources of metals in the area. South Pier munitions constituents sediment investigation results are shown on Figure 14.

### **Furnace Area**

Soil, sediment, and groundwater samples were collected from the Furnace Area. The Site was divided into two soil investigation areas and one intertidal sediment investigation area. The three investigation areas were further divided into surface and subsurface decision units for a total of six decision units (four soil and two sediment). Soil samples from four decision units and sediment samples from two decision units were collected via incremental sampling methodology. The surface soil samples were collected from 0-12 inches (0-1 feet) and the subsurface soil samples were collected from 12-24 inches (1-2 feet). Surface sediment samples were collected at 0-6 inches (0-0.5 feet) and the subsurface sediment samples were collected from 6-24 inches (0.5-2 feet). Groundwater samples were collected from three groundwater monitoring wells installed at the Furnace Area.

No explosives analytes were detected in surface or subsurface soils samples collected from the Site or from background locations. Of the 17 polychlorinated dibenzo-p-dioxins and dibenzofuranes constituents that the samples were analyzed for, most analytes were detected in at least one or more samples. Of those detected analytes, only 2,3,7,8- tetrachlorodibenzo-p-dioxin concentrations were reported at concentrations greater than the human health screening level in four of the 12 samples. The concentrations of 2,3,7,8-

tetrachlorodibenzo-p-dioxin were also above the ecological screening levels in five of the 12 samples. Four of the 12 samples collected (three surface and one subsurface samples) were also above the background values calculated.

For surface soil samples, the maximum detected concentrations of aluminum, chromium, and iron exceeded both the human health screening levels and arithmetic average background concentrations. For subsurface soil samples, the maximum detected concentrations of aluminum, antimony, chromium, iron, lead, and manganese exceeded the human health screening levels and arithmetic average background concentrations. Antimony, chromium, copper, lead, nickel, and zinc in surface soil and subsurface soil exceeded both ecological screening levels and arithmetic average background concentrations. Additionally, barium and manganese in subsurface soils also exceeded both ecological screening levels and the arithmetic average background values. Furnace Area munitions constituents soil investigation results are shown on Figure 15.

Surface and subsurface sediment sample concentrations of copper, iron, lead, and manganese exceeded both the human health screening level and arithmetic average background values. Additionally, chromium exceeded its human health screening level and arithmetic average background in subsurface sediment. Copper, iron, lead, nickel, and zinc exceeded ecological screening levels and arithmetic average background values in both surface and subsurface sediment samples. Antimony and chromium exceeded the ecological screening levels and arithmetic average background values only in subsurface sediment samples. Furnace Area munitions constituents sediment investigation results are shown on Figure 16.

In groundwater samples, dioxins and explosives constituents were not detected, with the exception of a trace detection of tetryl that was rejected. Perchlorate was detected in one of three samples below its United States Environmental Protection Agency's (USEPA) Tapwater Regional Screening Level (RSL). Chromium, iron, manganese, nickel, and strontium concentrations exceeded the USEPA Tapwater RSL. Furnace Area munitions constituents groundwater investigation results are shown on Figure 17. Background data was not collected for groundwater; however, exposure to groundwater was further evaluated and is discussed in the Risk Assessment section of this Proposed Plan.

### **Burial Area**

Surface soil, subsurface soil, surface sediment, and subsurface sediment samples were collected at the Burial Area via incremental sampling methodology. The surface soil samples were collected from 0-12 inches (0-1 feet) and the subsurface samples were collected from 12-24 inches (1-2 feet). The sediment sampling included 40 unbiased sediment samples (20 surface and 20 subsurface) which were collected along the western and southwestern boundary of the Burial Area. The surface sediment samples were collected from 0-6 inches (0-0.5 feet) and the subsurface samples were collected from 6-24 inches (0.5-2 feet). A grab soil sample was collected from 22 of the 26 test pits at various depths. Samples were not collected from four of the test pits due to presence of an asphalt road or asbestos, or due to steep slope.

No explosives analytes were detected in surface or subsurface soil samples collected from the Burial Area or from the soil background sampling locations. Metals were detected in the soil samples collected; of the munitions constituents metals that exceeded human health or ecological screening criteria (i.e., aluminum, antimony, barium, chromium, copper, iron, lead, manganese, mercury, nickel, strontium, and zinc), only aluminum was detected at concentrations below the average background for incremental samples collected, and aluminum and antimony were detected at concentrations in discrete test pit samples below the background threshold values. From the soil samples collected, all metals, except aluminum were reported above the background values. Burial Area munitions constituents soil investigation results are shown on Figures 18 and 19.

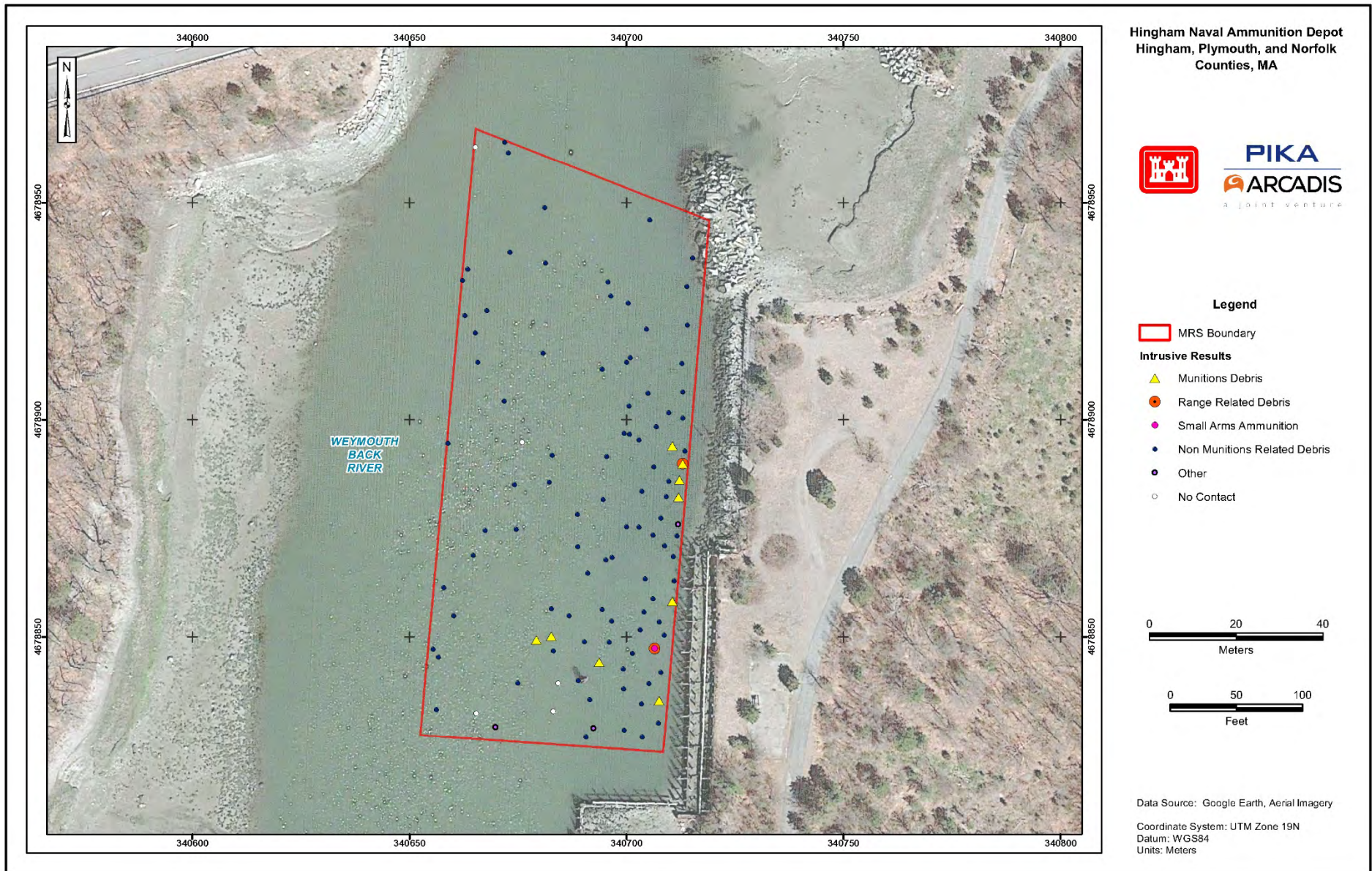
No explosives analytes were detected in sediment samples collected from the Burial Area or from background locations. Metals were detected in the sediment samples collected; of the metals that exceeded human health or ecological screening criteria (i.e., aluminum, antimony, chromium, copper, iron, lead, manganese, mercury, nickel, and zinc), all except aluminum, chromium, and mercury were detected at concentrations above the background threshold values. Burial Area munitions constituents sediment investigation results are shown on Figure 20.

### **Weymouth Back River**

Munitions constituents sampling was not conducted as part of the Remedial Investigation field activities. Since there was no munitions and explosives of concern or concentration of munitions debris indicative of a munitions constituents source found during the field activities, sampling for munitions constituents was not needed.

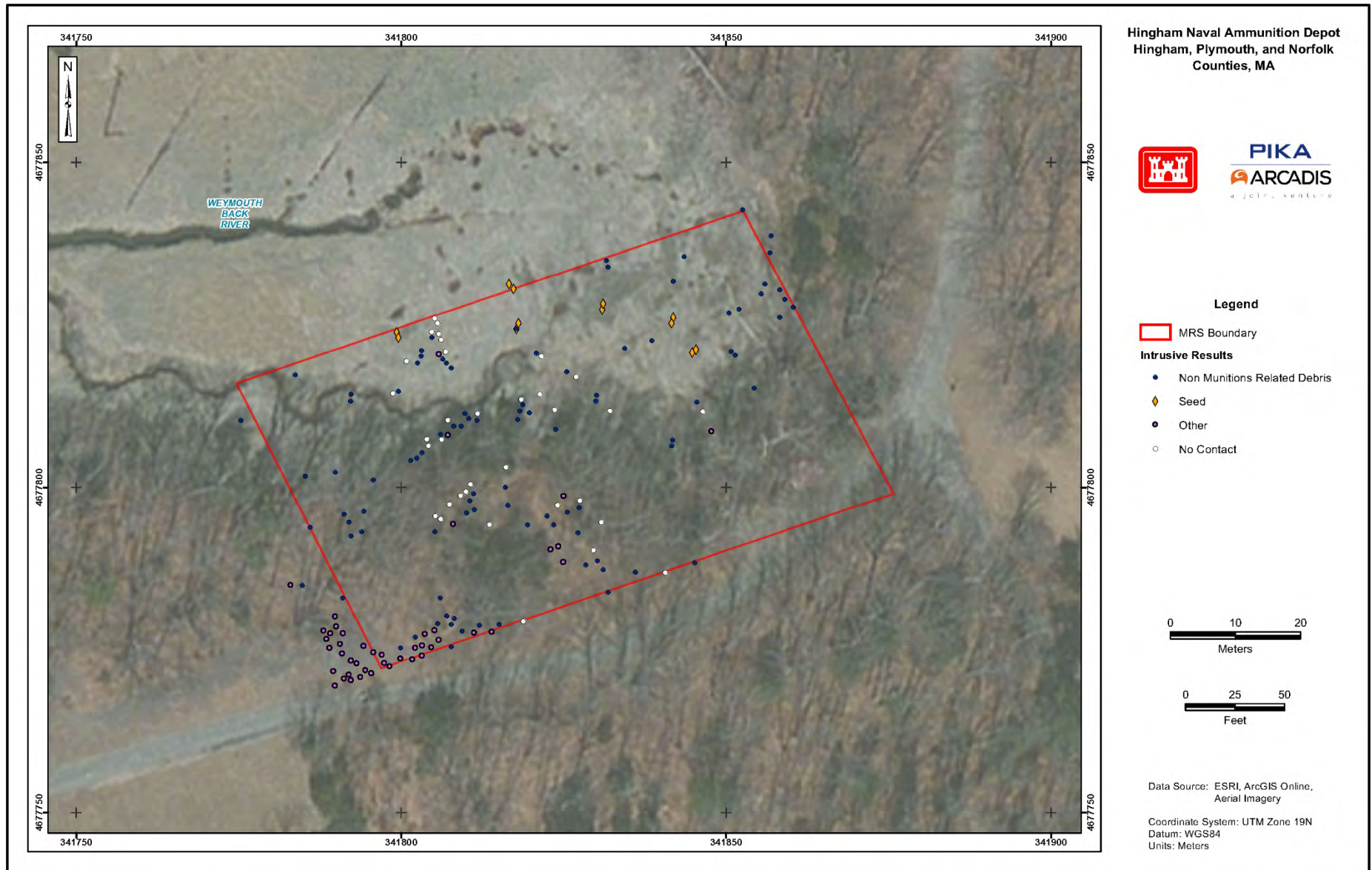


**Figure 3: North Pier Munitions and Explosives of Concern Investigation Results**

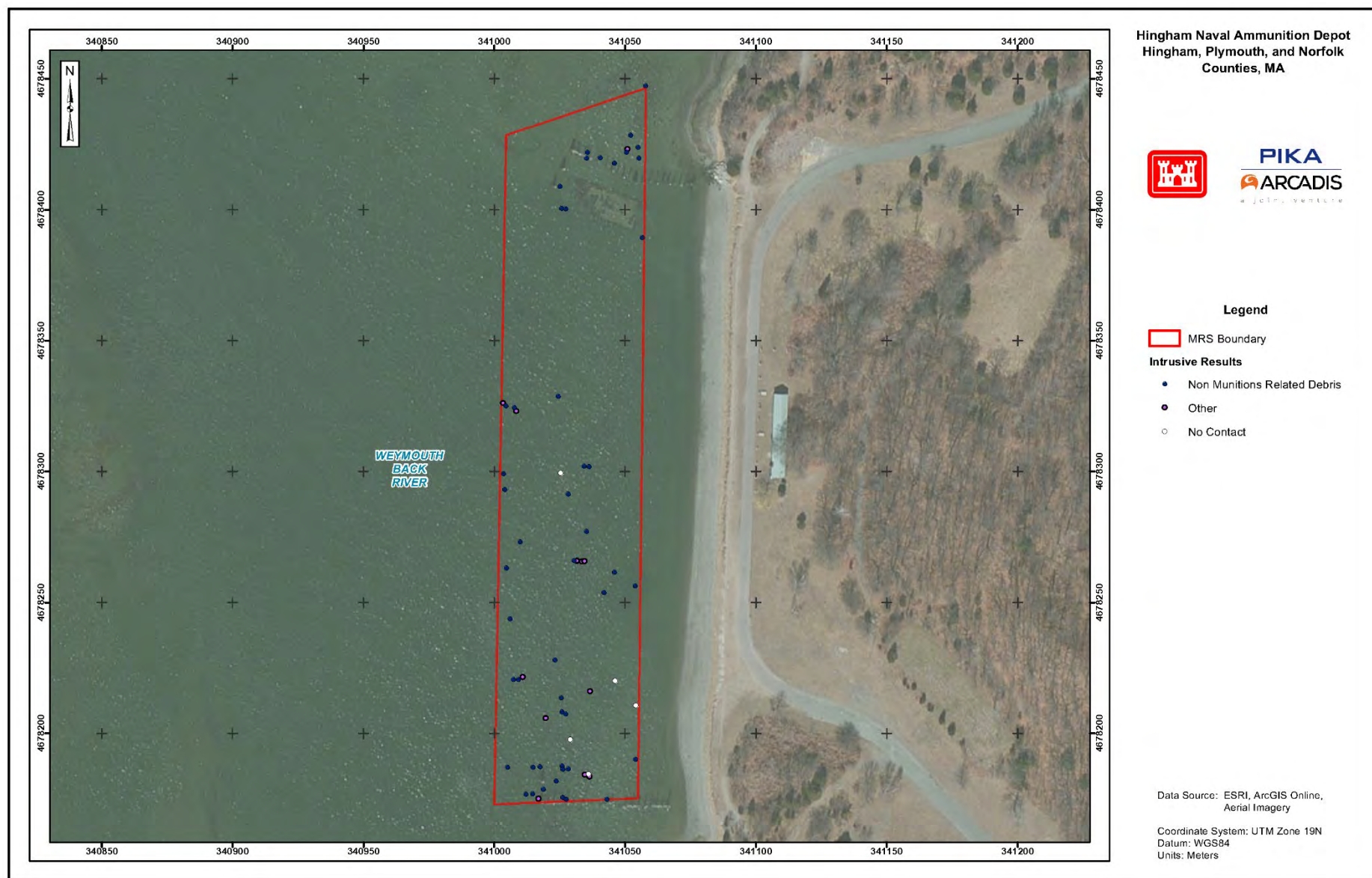




**Figure 4: Dump Area Munitions and Explosives of Concern Investigation Results**

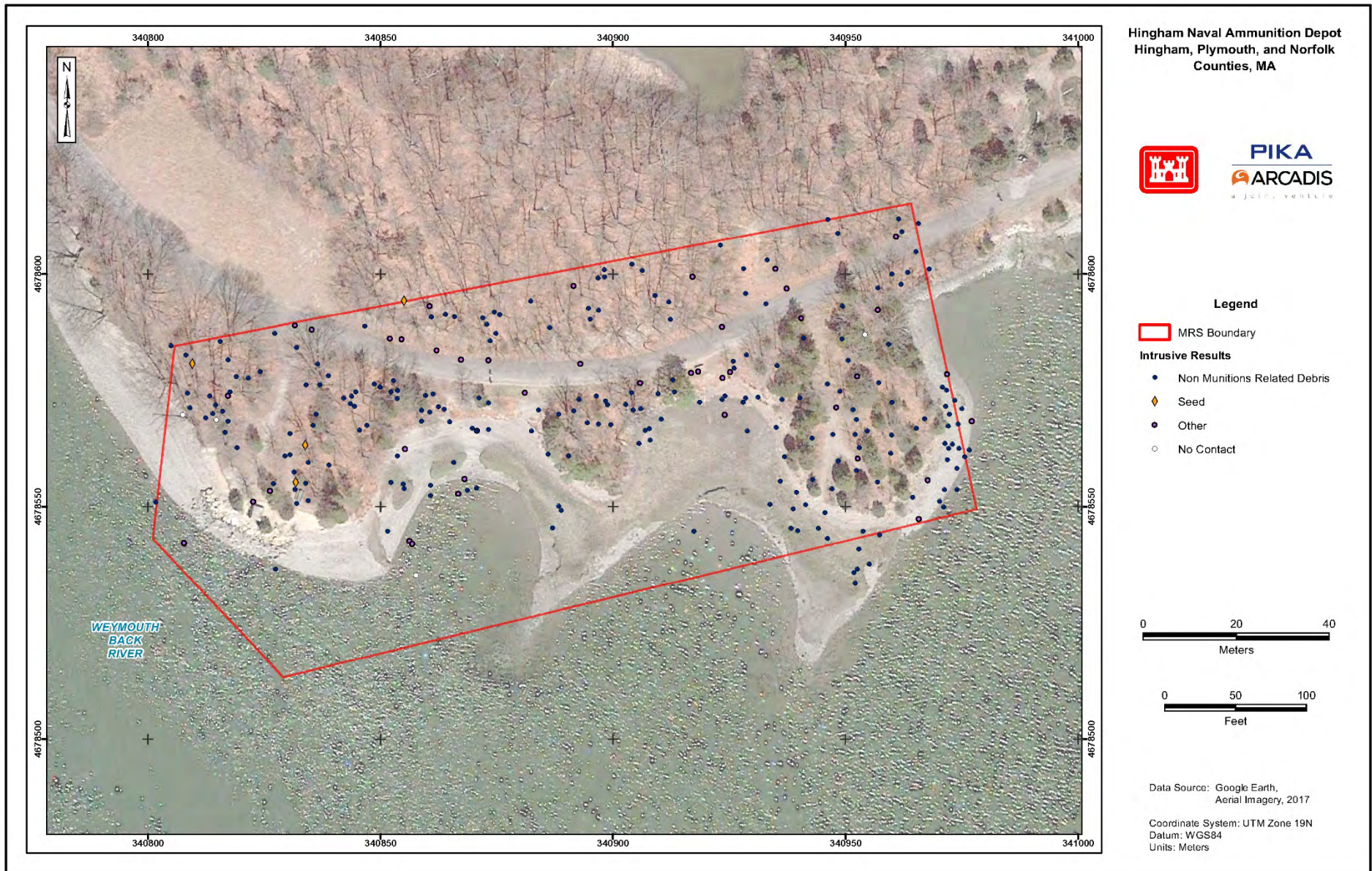


**Figure 5: South Pier Munitions and Explosives of Concern Investigation Results**



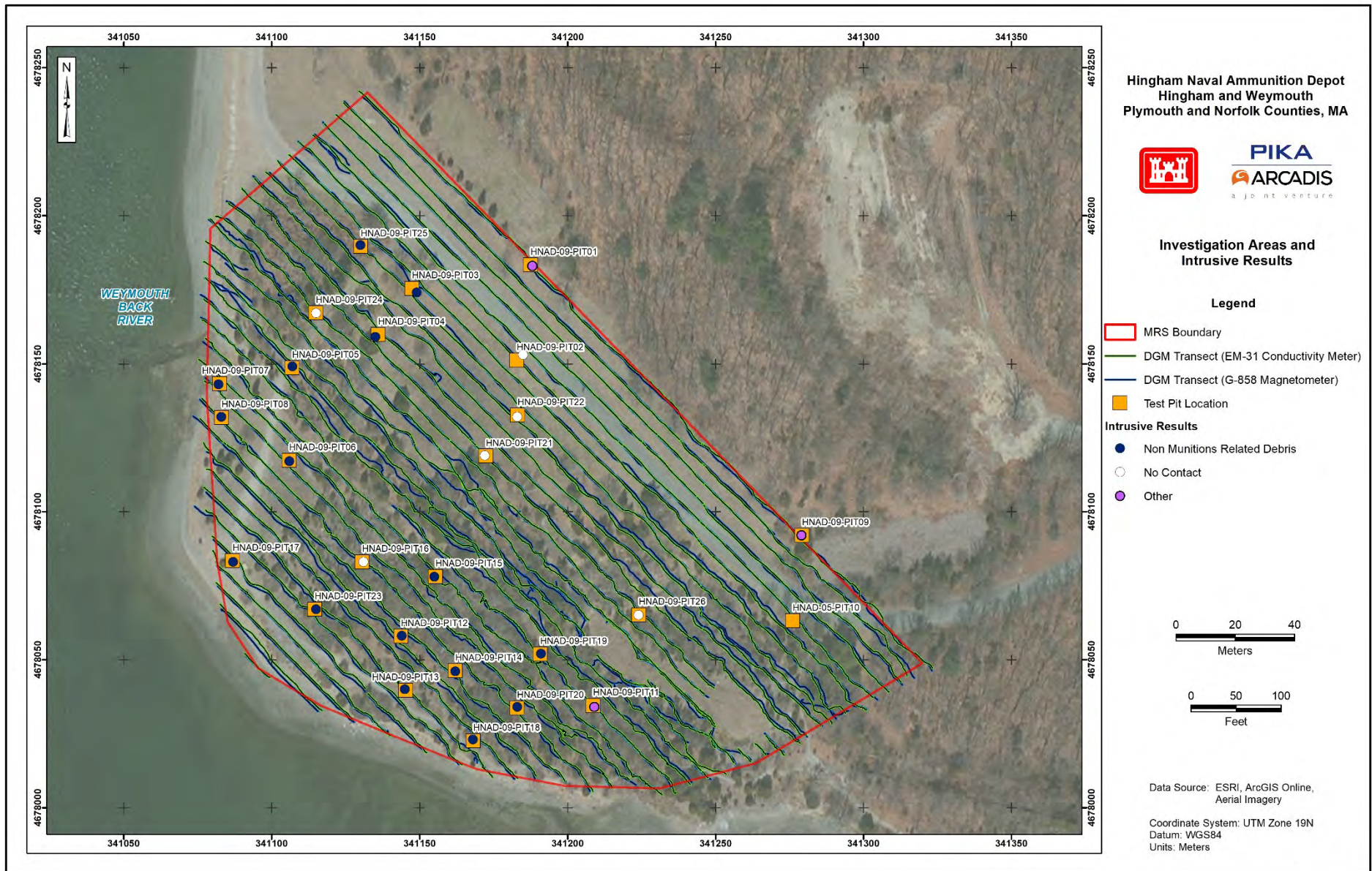


**Figure 6: Furnace Area Munitions and Explosives of Concern Investigation Results**





**Figure 7: Burial Area Munitions and Explosives of Concern Investigation Results**





**Figure 8: Weymouth Back River Munitions and Explosives of Concern Investigation Results**

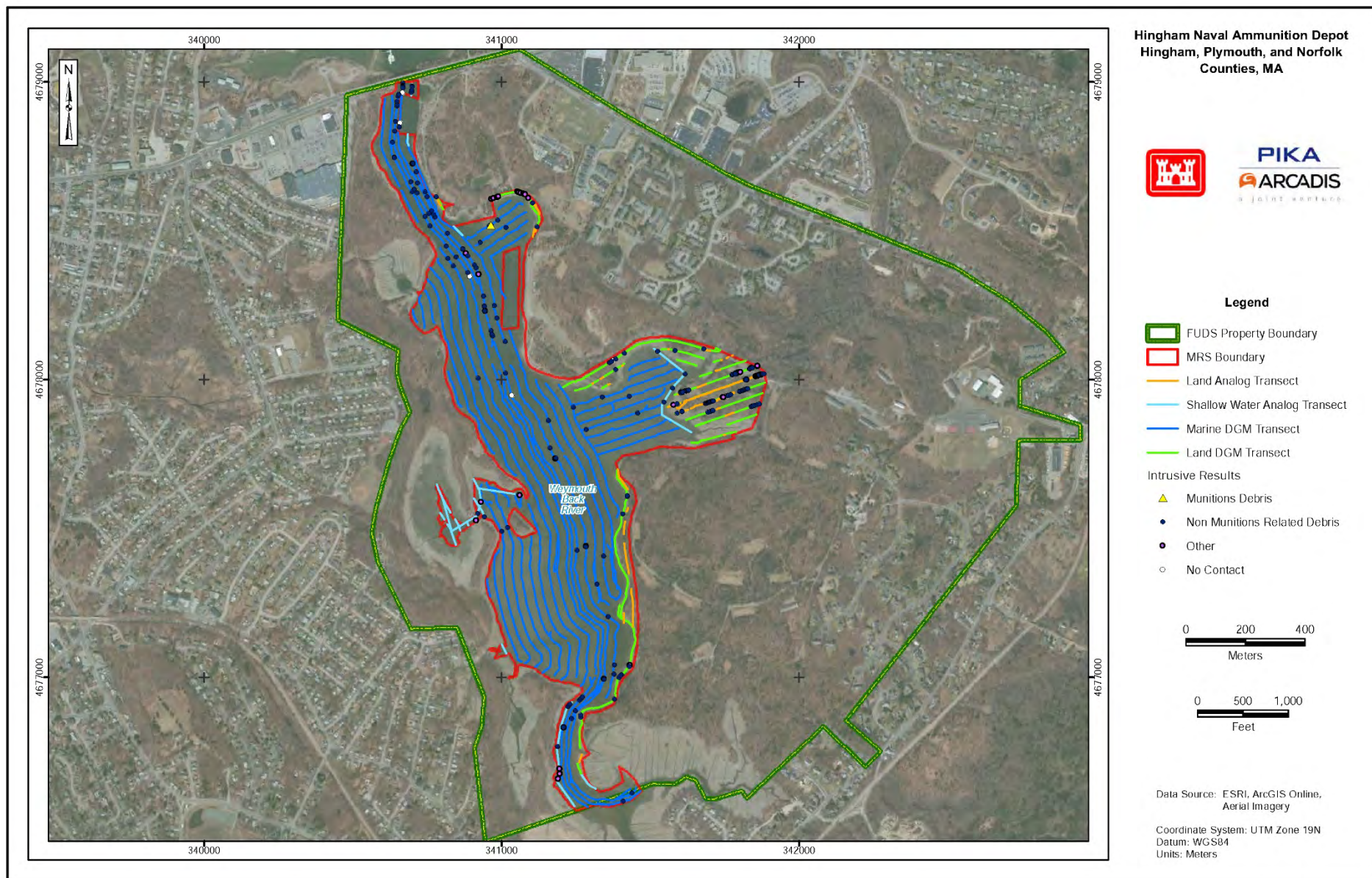
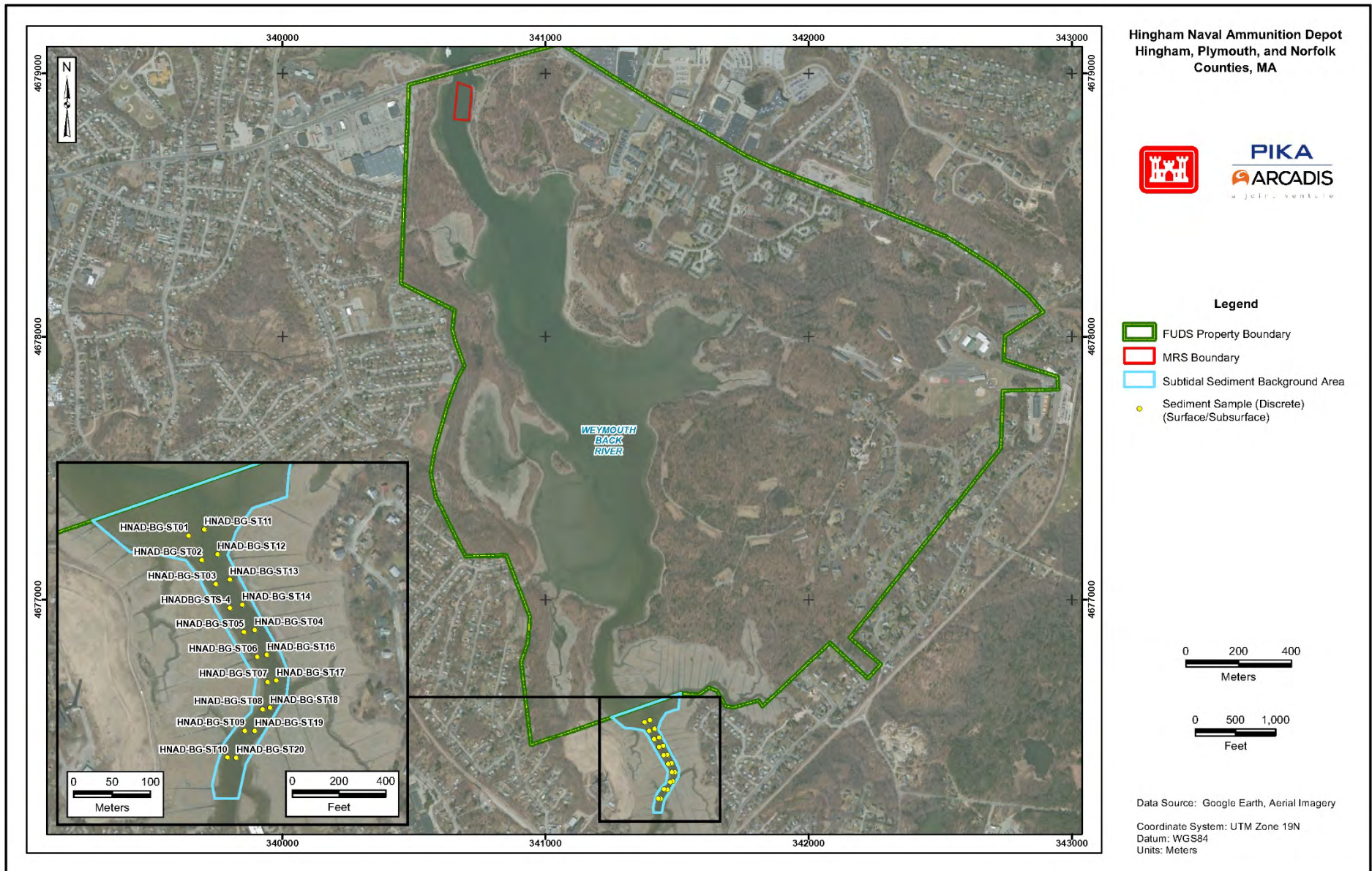




Figure 9: Background Discrete Sediment Sample Locations





**Figure 10: Background Discrete Soil Sample Locations**





Figure 11: Background Incremental Soil and Sediment Sample Locations

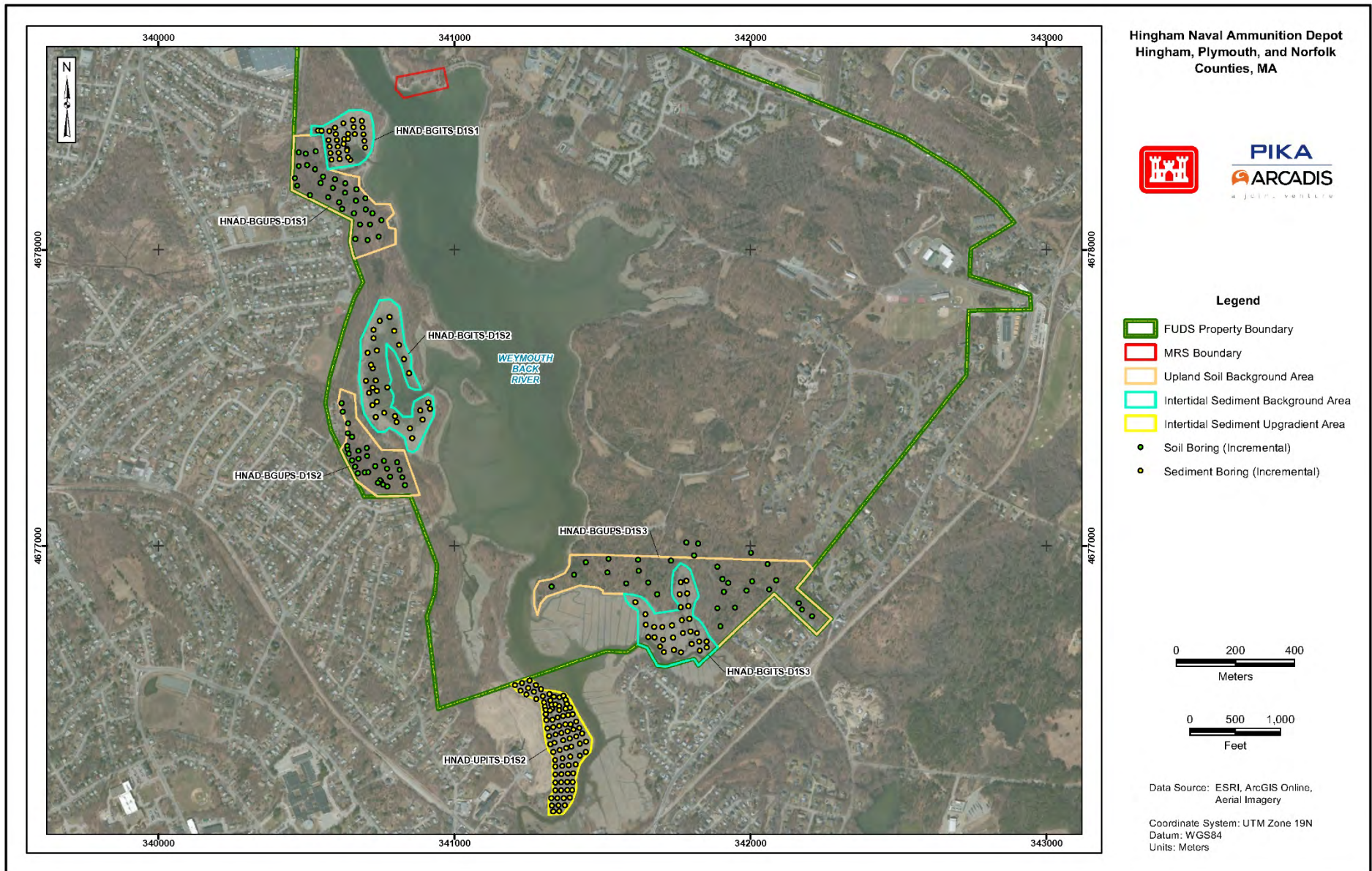




Figure 12: North Pier Munitions Constituents Sediment Investigation Results

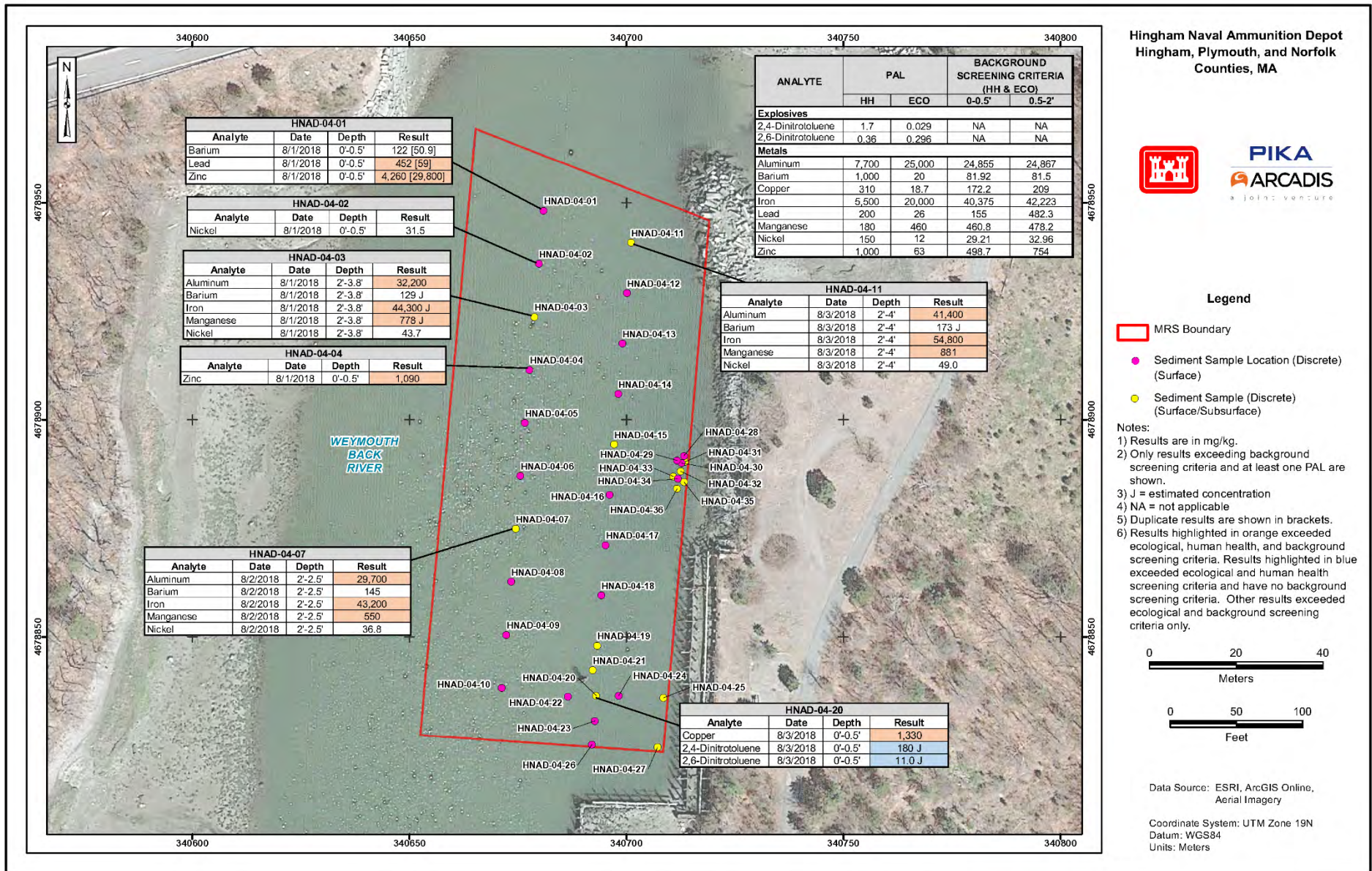




Figure 13: Dump Area Munitions Constituents Soil Investigation Results

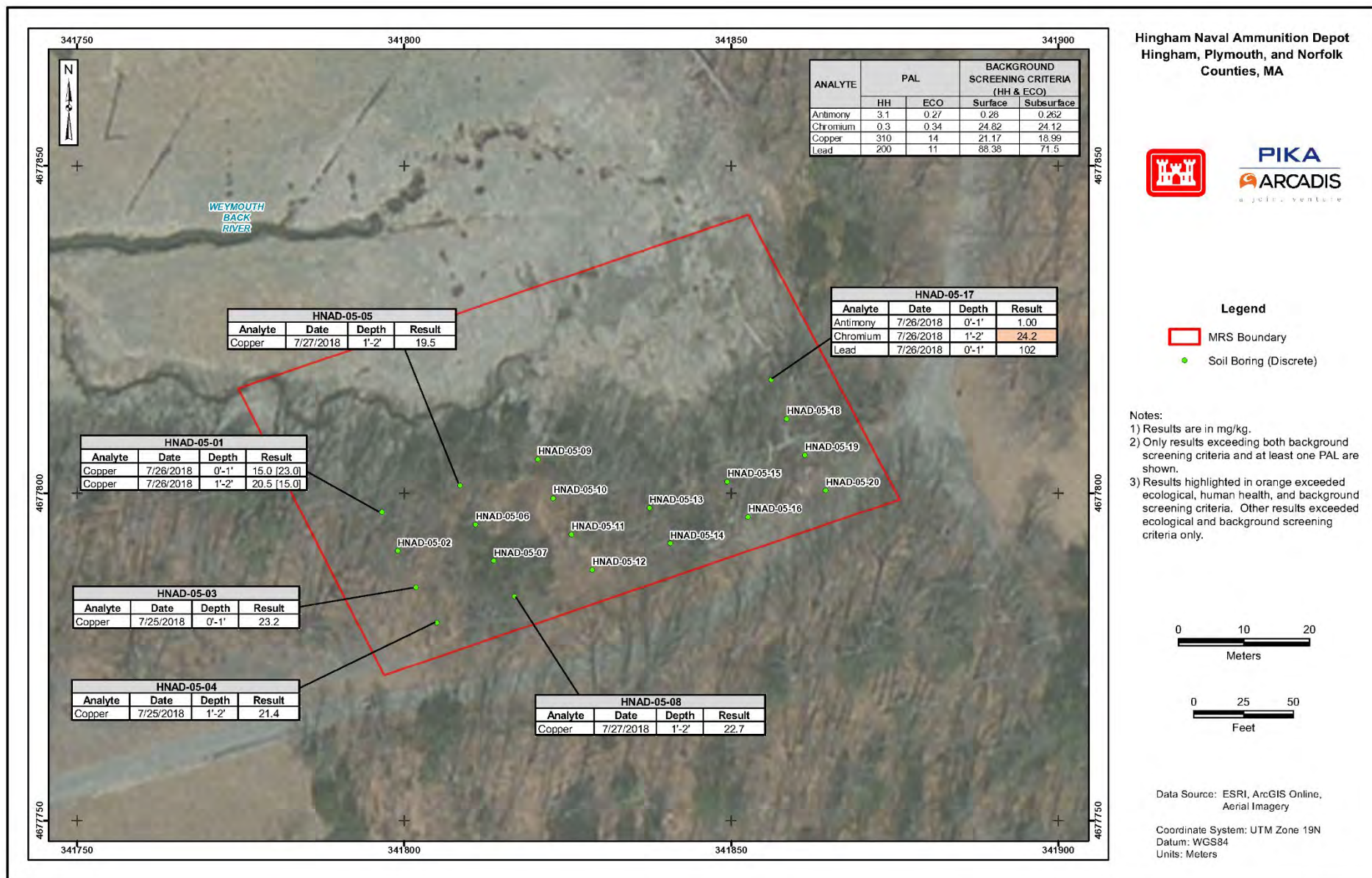




Figure 14: South Pier Munitions Constituents Sediment Investigation Results

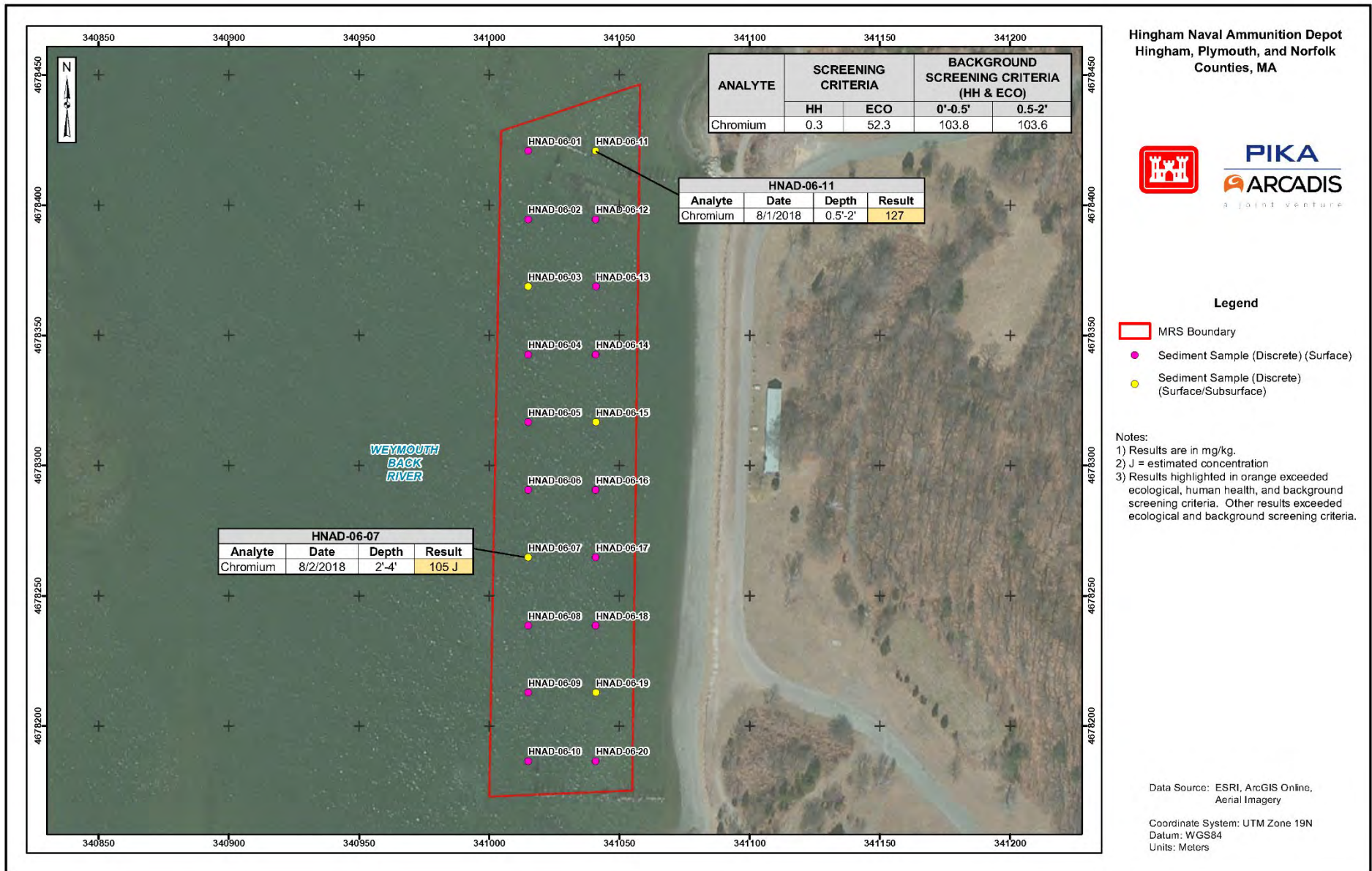




Figure 15: Furnace Area Munitions Constituents Soil Investigation Results

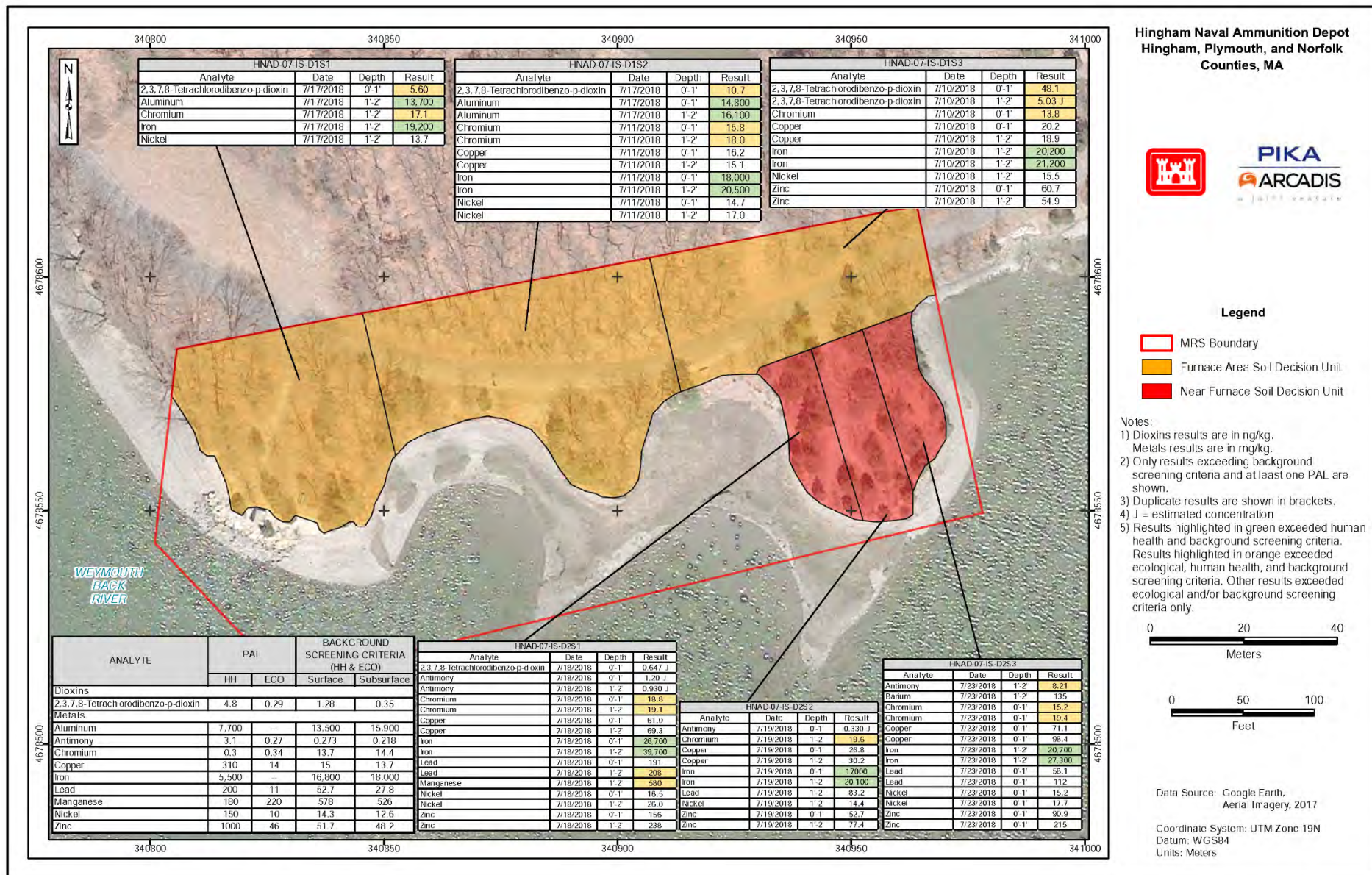




Figure 16: Furnace Area Munitions Constituents Sediment Investigation Results

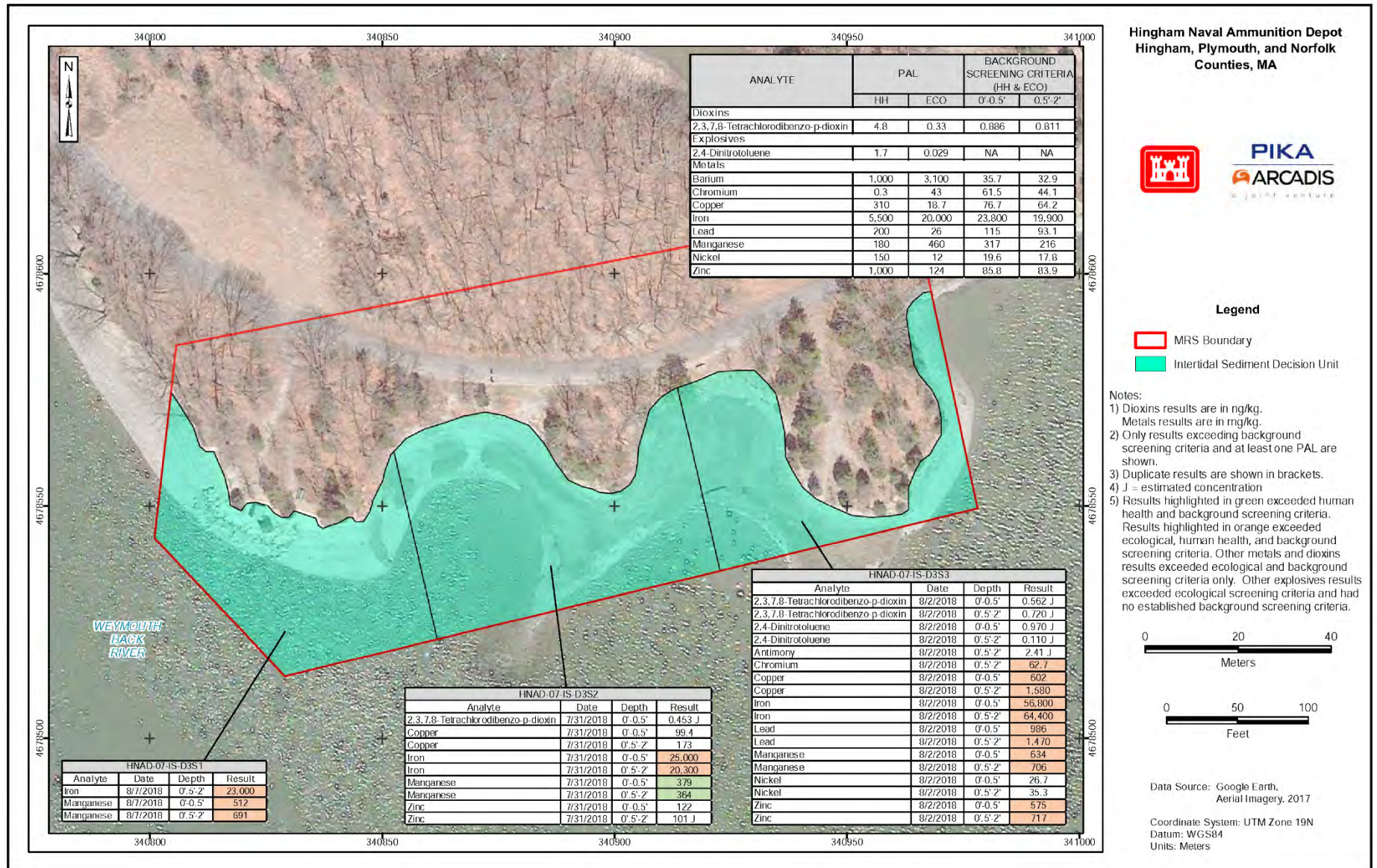




Figure 17: Furnace Area Munitions Constituents Groundwater Investigation Results

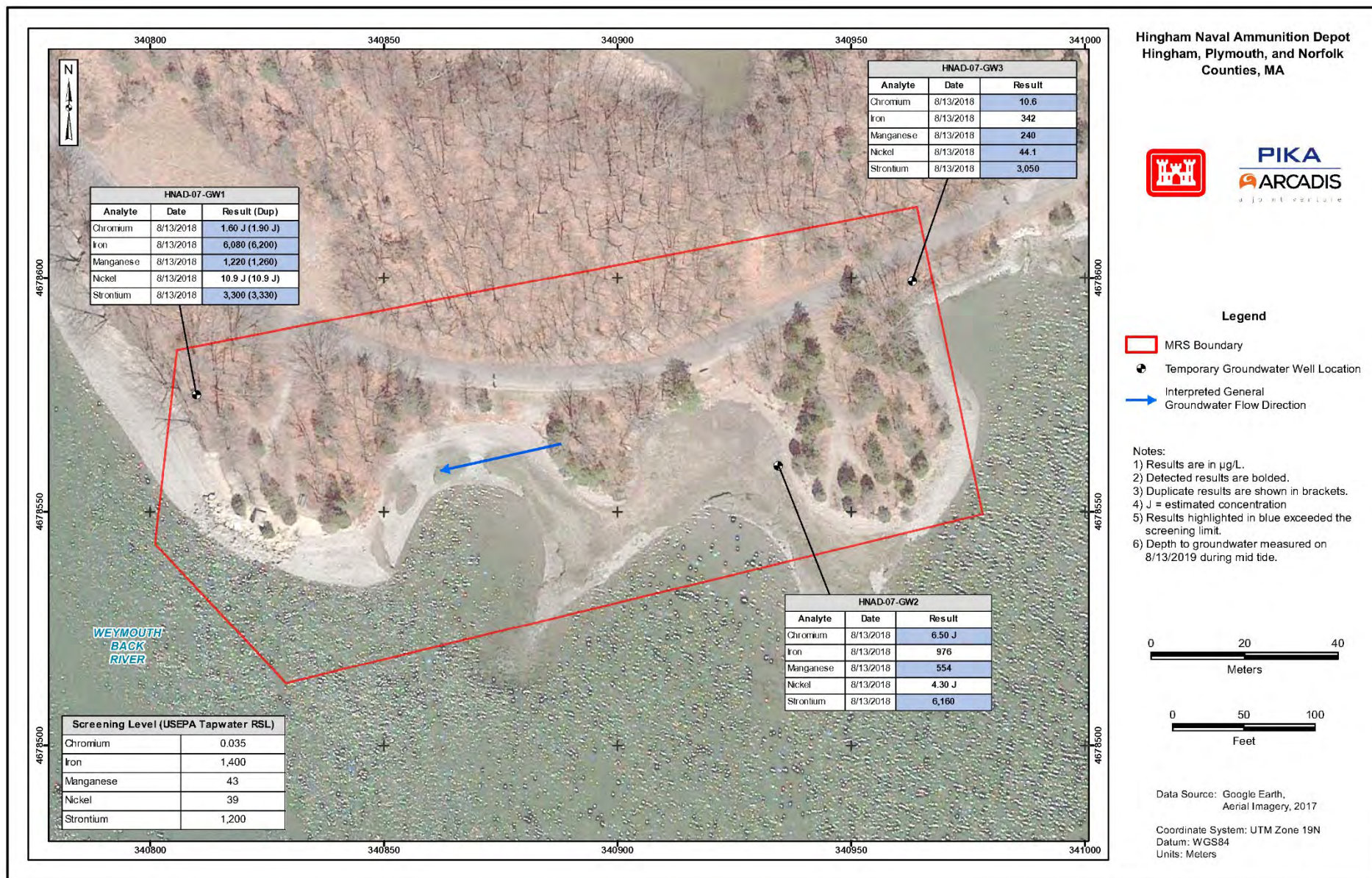




Figure 18: Burial Area Munitions Constituents Soil Investigation Results

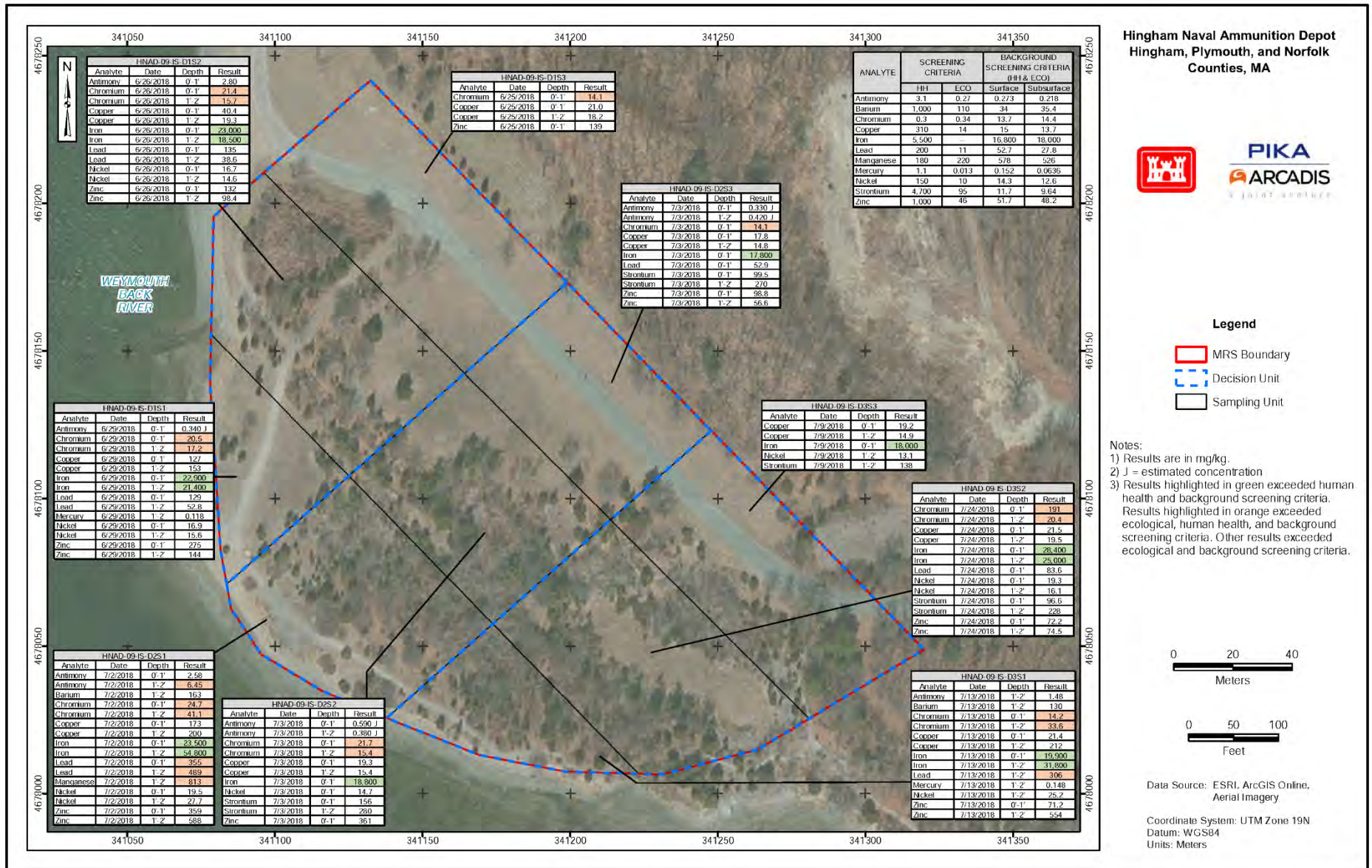




Figure 19: Burial Area Munitions Constituents Test Pit Soil Investigation Results

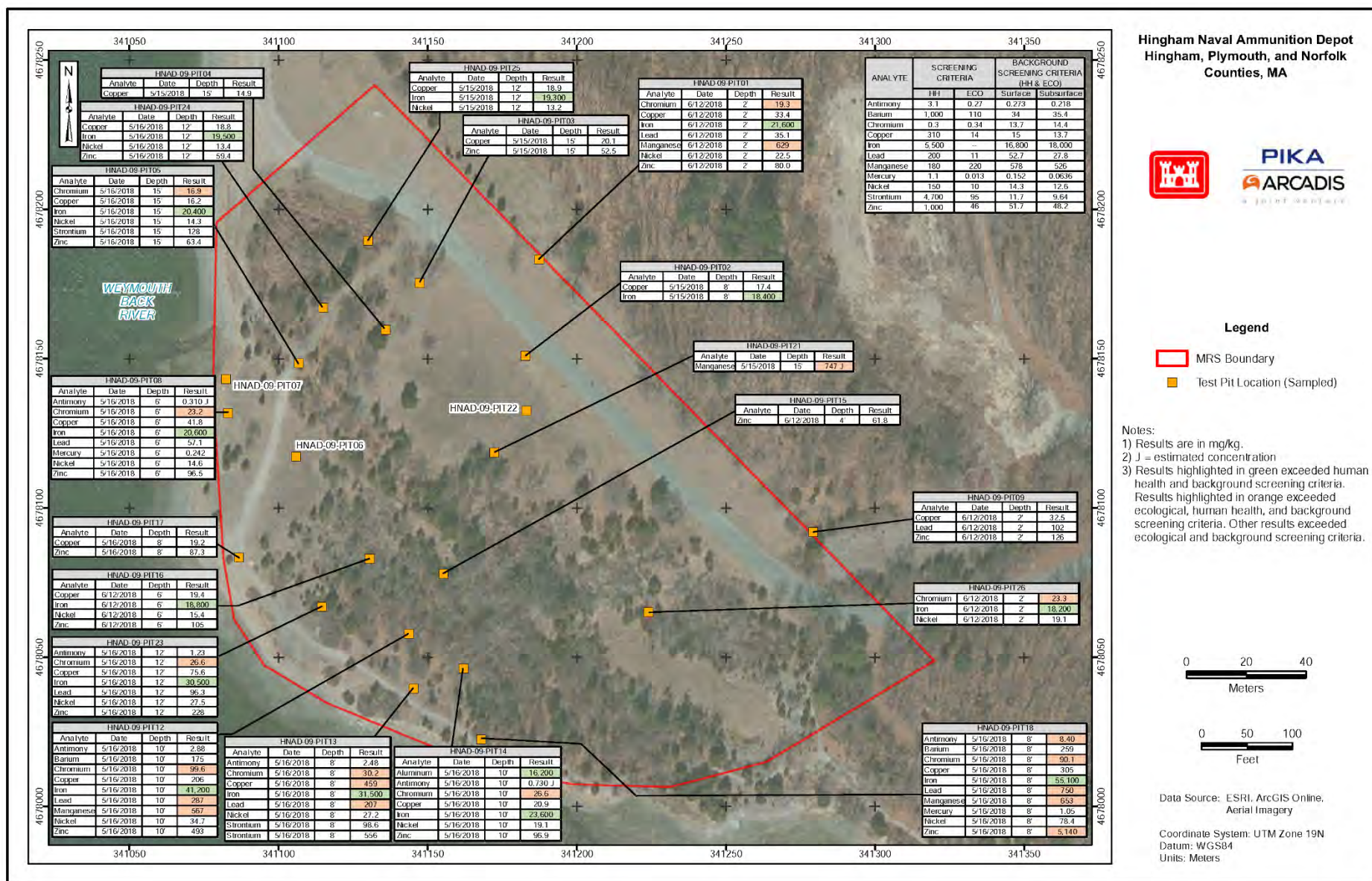
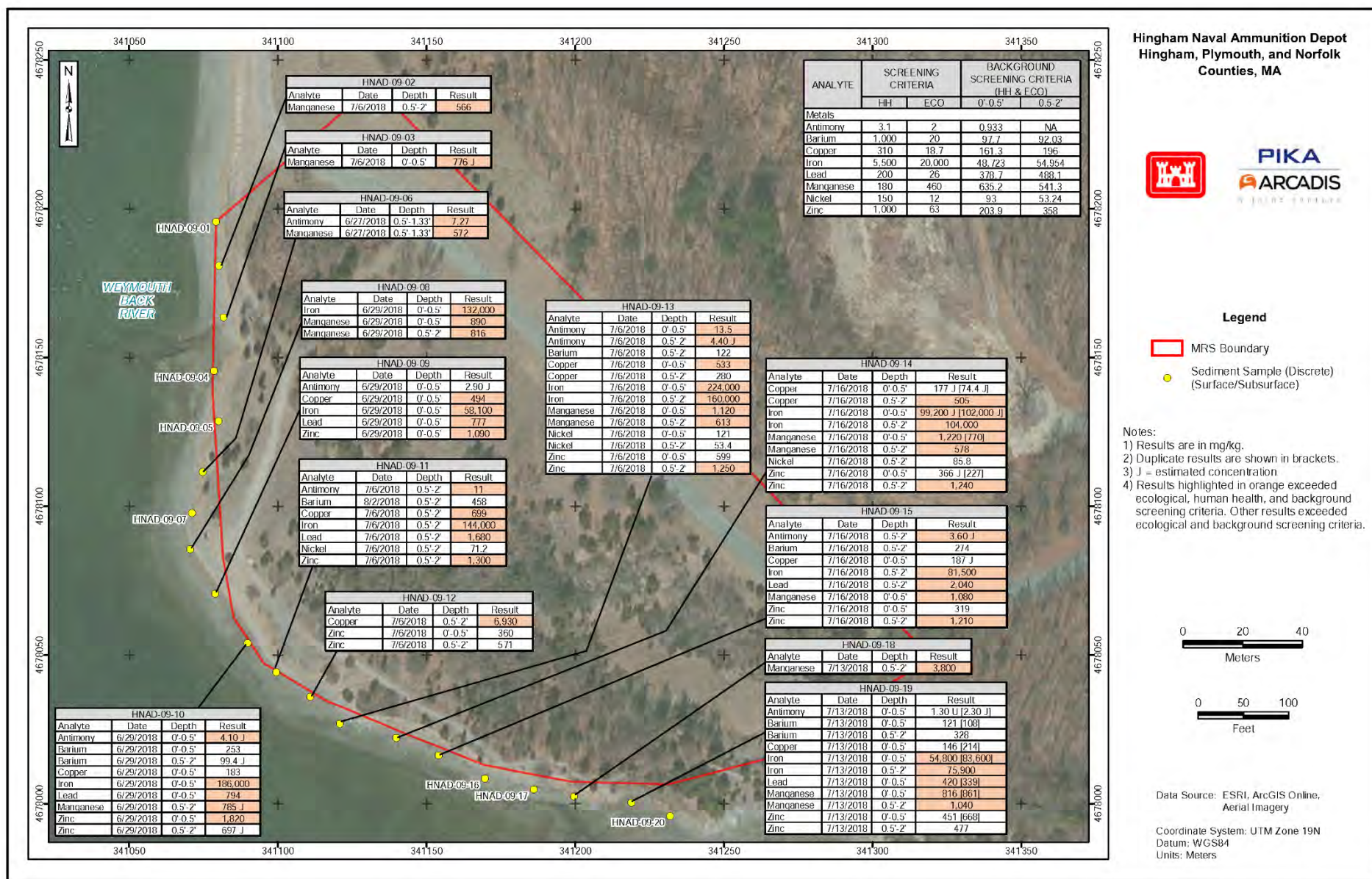




Figure 20: Burial Area Munitions Constituents Sediment Investigation Results



## **Risk Assessment**

As part of the Remedial Investigation at the former Hingham Naval Ammunition Depot, a baseline risk assessment was conducted to determine the human health and ecological risks associated with potential munitions and explosives of concern and munitions constituents at the Sites.

### ***North Pier***

Fifteen empty 40-millimeter cartridge casings were recovered. These casings were badly corroded from decades of saltwater immersion. These items were not characterized as munitions debris indicative of munitions and explosives of concern because there has been no evidence of 40-millimeter projectiles (practice or high explosive), cartridge casings with remaining propellant or primers, or complete rounds. Based on the fact only barges and small boats were used at Hingham Naval Ammunition Depot, the 40-millimeter fixed ammunition likely would have been fired from a cannon on a Navy ship in open water and the expended cartridge casings returned to Hingham Naval Ammunition Depot for disposal. The munitions and explosives of concern risk assessment indicates 'Acceptable' Site conditions based on the risk management methodology. There is no land portion to the North Pier and no munitions and explosives of concern were identified underwater. Therefore, the Munitions and Explosives of Concern Hazard Assessment was not completed for the North Pier. No munitions constituents risk assessment was warranted as no munitions constituents sources were identified at the North Pier in previous investigations or during the Remedial Investigation field activities, and metals detected are likely attributable to local conditions, such as natural variability or other sources of metals deposited from land use in the surrounding watershed.

### ***Dump Area***

No munitions and explosives of concern or munitions debris items indicative of munitions and explosives of concern were recovered. The non-munitions related debris items recovered at the Dump Area were consistent with historical information. These results correspond with previous investigations at the Site, which also did not locate munitions and explosives of concern. The munitions constituents sample results for surface and subsurface soils did not exceed screening levels for explosives or metals and were below or equal to background values. No assessment of the potential for risk and hazard is warranted as no munitions and explosives of concern or munitions debris was found; therefore, no source of munitions constituents is present.

### ***South Pier***

No munitions and explosives of concern or munitions debris were found during the Remedial Investigation; therefore, no source of munitions constituents is present. No assessment of the potential for risk and hazards is warranted because it is unlikely that metals detected in samples from the South Pier Site are associated with munitions constituents sources. These are likely attributable to local conditions, such as natural variability or other sources of metals in the area.

### ***Furnace Area***

No munitions and explosives of concern or munitions debris were found during the Remedial Investigation; therefore, no munitions and explosives of concern hazard assessment was warranted. A munitions constituents risk assessment was completed based on the screening level exceedances observed in the reported munitions constituents data, as discussed in the preceding Munitions Constituents section of this Proposed Plan.

Based on the data evaluation and a comparison to background, no human health chemicals of potential concern were selected for quantitative evaluation in surface soil and 2,3,7,8-tetrachlorodibenzo-p-dioxin toxic equivalence and iron were selected as a human health chemicals of potential concern for combined surface and subsurface (All Soil). Based on the data evaluation and background comparison, no human health chemicals of potential concern were selected for quantitative evaluation in surface sediment and manganese was selected as a human health chemical of potential concern in combined surface and subsurface (All Sediment). Based on the evaluation of groundwater data by comparison of detected munitions constituents concentrations to risk-based screening levels protective of recreators and construction workers, there are no human health chemicals of potential concern in groundwater at the

Furnace Area. Based on the results of the baseline human health risk assessment, there is sufficient evidence that there is no potential risk to human health at the Furnace Area and no further evaluation is warranted.

For ecological evaluation, the preliminary contaminants of potential ecological concern in soil for community-level receptors with hazard quotient greater than 1, including those without screening values, are aluminum, antimony (subsurface only), chromium, iron, lead, magnesium, manganese, strontium, and tungsten. The preliminary contaminants of potential ecological concern in soil for wildlife receptors with hazard quotient greater than 1, including those without screening values, are aluminum, copper (subsurface only) iron, lead, magnesium, mercury, nickel, tungsten, and zinc. While comparison of dioxin/furan concentrations at the Site in subsurface soil may not be comparable to background, local deposition of historical air emissions from the incinerator upwind of Hingham Naval Ammunition Depot is a possible source.

The preliminary contaminants of potential ecological concern for community-level receptors in sediment with hazard quotient greater than 1, including those without screening values, are 2,3,7,8-tetrachlorodibenzo-p-dioxin, 2,4-dinitrotoluene, copper, iron, lead, magnesium, mercury, nickel, tungsten, and zinc. The preliminary contaminants of potential ecological concern for wildlife receptors with hazard quotients greater than 1, including those without screening values, are 2,3,7,8-tetrachlorodibenzo-p-dioxin, copper, lead, magnesium, mercury, nickel, tungsten, and zinc. With a few exceptions, the majority of the preliminary contaminants of potential ecological concern were determined to be consistent with background. 2,3,7,8-Tetrachlorodibenzo-p-dioxin was not consistent with background in subsurface soil, and therefore, was carried into the Screening Level Ecological Risk Assessment refinement. Based on the Screening Level Ecological Risk Assessment and the Screening Level Ecological Risk Assessment refinement, there is sufficient evidence to conclude the potential for ecological risk at the Site is negligible and no further evaluation is warranted.

### **Burial Area**

No munitions and explosives of concern or munitions debris items indicative of munitions and explosives of concern were recovered. The non-munitions related debris items recovered at the Burial Area was consistent with historical information. These results correspond with previous investigations at the Site, which also did not locate munitions and explosives of concern. Additionally, any metals that have been identified are likely associated with non-munitions related debris found in the Burial Area (i.e., not munitions and explosives of concern related). No assessment of the potential for risk and hazard is warranted as no munitions and explosives of concern or munitions debris was found; therefore, no source of munitions constituents is present.

### **Weymouth Back River**

An empty and badly corroded MK1 MOD1 Submarine Float Signal M69 was identified. The munitions debris were identified, inspected, and documented as safe during the Remedial Investigation field activities. If any items remain, they are more likely to be similar to the materials documented as safe that were found and not likely to present an explosive hazard. The MK1 MOD1 Submarine Float Signal M69, when intact contains a primer and a smoke mixture, but no propellant as compressed air was used as a propellant from a submerged submarine. If other similar items remain at Weymouth Back River, they too are likely corroded. However, if any MK1 MOD1 Submarine Float Signal M69 were to remain intact, the severity of explosive incident would be minor. The munitions and explosives of concern risk assessment was completed based on a review of the historical site information and review of all investigations conducted to date on the Site. Based on the munitions and explosives of concern risk assessment, acceptable site conditions were determined for the Weymouth Back River Site. Since there were no munitions and explosives of concern hazards identified, no munitions constituents source areas exist and munitions constituents sampling was not required. Therefore, there is no risk identified for human or ecological receptors.

### **To Summarize**

No munitions and explosives of concern were found at the former Hingham Naval Ammunition Depot during the Remedial Investigation. These findings confirm previous site documentation presented in the Preliminary Assessment/Site Inspection that indicated the type of items that were manufactured, tested, and shipped at the former Hingham Naval Ammunition Depot. Most items found during the intrusive investigation at North

Pier, Dump Area, South Pier, Furnace Area, Burial Area, and Weymouth Back River were non-munitions related debris (e.g., nails, rebar, wire, and scrap metal pieces) and were consistent with historical information. Munitions debris and non-munitions related debris were inspected, certified as free of explosives, and recycled.

Based on the Remedial Investigation findings, exposure pathways for receptors for munitions and explosives of concern are incomplete for the North Pier, Dump Area, South Pier, Furnace Area, and Burial Area at the former Hingham Naval Ammunition Depot because no munitions and explosives of concern, or munitions debris indicative of munitions and explosives of concern, were identified in these areas during the Remedial Investigation field activities. Similarly, exposure pathways for receptors for munitions constituents are incomplete for the North Pier, Dump Area, South Pier, Burial Area, and Weymouth Back River at the former Hingham Naval Ammunition Depot because no munitions constituents sources were identified in these areas.

Based on historical information and the Remedial Investigation findings, there is no unacceptable risk associated with munitions or munitions constituents at the six Sites included in the Remedial Investigation at the former Hingham Naval Ammunition Depot. No further action is required to address munitions or munitions constituents at the Sites. Table 1 provided a summary of the Remedial Investigation findings. As such, a No Action determination is supported for the Sites and a **Feasibility Study** to develop and evaluate remedial alternatives is not needed.

**Table 1: Summary of Results**

Site	Munitions and Explosives of Concern Risk Assessment (Yes/No)	Munitions Constituents Risk Assessment (Yes/No)	No Unacceptable Risk / No Further Action (Yes/No)
North Pier	No	No	Yes
Dump Area	No	No	Yes
South Pier	No	No	Yes
Furnace Area	No	Yes	Yes
Burial Area	No	No	Yes
Weymouth Back River	No	No	Yes

## SCOPE AND ROLE OF THE RESPONSE ACTION

For Sites with no hazard or unacceptable risk, such as the former Hingham Naval Ammunition Depot, risk management is not needed, and a decision for No Action is appropriate.

## SUMMARY OF SITE RISKS

Hazards and risks were evaluated based on the potential for human health and the environment to be exposed to munitions and explosives of concern and munitions constituents. The potentially exposed human receptors include all those who pass through, work in, or visit the area. The potentially exposed ecological receptors include both transient or permanent aquatic/semi-aquatic/terrestrial biota such as benthic invertebrates, emergent or submerged plants, mammals, birds, or reptiles and includes several threatened or endangered species such as the northern long eared bat (*Myotis Septentrionalis*), Plymouth redbelly turtle (*Pseudemys Rubriventris Bangsi*), marbled salamander (*Ambystoma Opacum*), and piping plover (*Charadrius melodus*). Based on historical information and the Remedial Investigation findings, there is no unacceptable risk for exposure to munitions and explosives of concern or munitions constituents at the former Hingham Naval Ammunition Depot. This is supported by the Remedial Investigation as summarized in the section above.



## REMEDIAL ACTION OBJECTIVE

For the former Hingham Naval Ammunition Depot, remedial action is not needed because the Remedial Investigation findings indicate no unacceptable risk for exposure to munitions and explosives of concern or risk from exposure to munitions constituents at the six Sites (North Pier, Dump Area, South Pier, Furnace Area, Burial Area, and Weymouth Back River). As such, **Remedial Action Objectives** are not necessary.

## EVALUATION OF ALTERNATIVES

The proposed decision for these Sites is **No Action**. The USACE did not develop or evaluate other alternatives because there are no unacceptable risks for exposure to munitions and explosive of concern or munitions constituents at the former Hingham Naval Ammunition Depot. The No Action approach means that the USACE will not take any action, and if the proposed decision for No Action is implemented, the use of the Sites will continue in their current condition.

There are no unacceptable risks to human health or the environment attributable to the Department of Defense at the former Hingham Naval Ammunition Depot. For this reason, the only recommended approach is No Action. Development or evaluation of other alternatives was not required.

## PREFERRED APPROACH

The proposed decision for the former Hingham Naval Ammunition Depot is No Action. It is appropriate because there are no unacceptable risks to human health or the environment. The Massachusetts Department of Environmental Protection has reviewed the Remedial Investigation report and agree with the USACE analysis. Based on discussions during project meetings, the regulators have indicated that a No Action decision is acceptable for the Sites. The regulators and the public will have the opportunity to review and comment on this Proposed Plan and the proposed decision for No Action. Community acceptance of the proposed decision for No Action will be evaluated after the public comment period. The USACE may modify the proposed decision for No Action in response to public comments or new information.

## COMMUNITY PARTICIPATION

The USACE is requesting public comments on this Proposed Plan. Comments will be accepted at a public meeting, as well as throughout the public comment period. The virtual public meeting will be held on March 16, 2021 at 6PM EST.

Presentation and Virtual Meeting Microsoft Teams Application link will be available at town of Hingham website (<https://www.hingham-ma.gov/810/Naval-Ammo-Depot>) and the town of Weymouth website (<https://www.weymouth.ma.us/>).

Representatives from the USACE will be present to explain the Proposed Plan, listen to concerns, answer questions, and accept public comments. The public comment period will be held from March 01, 2021 through March 31, 2021. Comments can be submitted to USACE by using the contact information listed below. The USACE will accept comments on the Proposed Plan during this period.

The USACE will consider comments received during the comment period and public meeting. The final decision that the USACE makes will be presented in the Decision Document. The USACE' responses to public comments will be included in the Responsiveness Summary section of the Decision Document.

All reports and project documents are available for review in the Administrative Record file at the Hingham Public Library located at 66 Leavitt Street, Hingham, Massachusetts, and the Tufts @ Pratt Library located at 46 Broad Street, Weymouth, Massachusetts.

### **Formerly Used Defense Site Program Contact Information**

Telephone: 978-318-8180

Email: Gina.A.Kaso@usace.army.mil

Mail: Ms. Gina Kaso

USACE, New England District

Attn: CENAE-PP

696 Virginia Road

Concord, Massachusetts 01742

### **Information Repository**

The documents that comprise the Administrative Record file, including the Remedial Investigation report, are available for review at the following locations:

Hingham Public Library

66 Leavitt Street

Hingham, Massachusetts 02043

Tufts @ Pratt Library

46 Broad Street

Weymouth, Massachusetts 02188



## GLOSSARY OF TERMS

**Administrative Record:** The documents that form the basis for the selection of a response action compiled and maintained by the lead agency.

**Anomaly:** An item that is seen as a subsurface irregularity after geophysical investigation. This irregularity will deviate from the expected subsurface ferrous and non-ferrous material at a site (e.g., munitions, munitions debris, small arms ammunition, nails, cans/can lids, wire, scrap metal).

**Comprehensive Environmental Response, Compensation, and Liability Act:** This federal law was passed in 1980, amended by the Superfund Amendments and Reauthorization Act of 1986, and is commonly referred to as "Superfund." It provides for liability, compensation, assessment, remediation, and emergency response in connection with the cleanup of inactive sites that endanger public health and safety or the environment.

**Decision Document:** This legal document is signed by the Army and reviewed by the Massachusetts Department of Environmental Protection, the Town of Hingham, and the Town of Weymouth. It provides the response action selected for a site, the basis for selecting that response action, public comments, responses to comments, and the estimated cost of the response action.

**Digital Geophysical Mapping:** A data collection process that employs a metal detector system to digitally record sensor and position data for subsequent data analysis and presentation.

**Feasibility Study:** A study undertaken by the lead agency to develop and evaluate options for remedial action. The Remedial Investigation data is used to define the objectives of the response action, to develop remedial action alternatives, and to undertake an initial screening and detailed analysis of the alternatives.

**Formerly Used Defense Sites:** A facility or site that was under the jurisdiction of the Secretary of Defense and owned by, leased to, or otherwise possessed by the United States at the time of actions leading to contamination by hazardous substances, for which the Secretary of Defense shall carry out all response actions with respect to release of hazardous substance from that facility or site.

**Military Munitions:** All ammunition products and components produced for or used by armed forces for national defense and security, including ammunition products or components under the control of the Department of Defense, the U.S. Coast Guard, the U.S. Department of Energy, and the National Guard. The term includes: confined gaseous, liquid, and solid propellants; explosives, pyrotechnics, chemical and riot control agents, smokes, and incendiaries, including bulk explosives, and chemical warfare agents; chemical munitions, rockets, guided and ballistic missiles, bombs, warheads, mortar rounds, artillery ammunition, small arms ammunition, grenades, mines, torpedoes, depth charges, cluster munitions and dispensers, demolition charges, and devices and components thereof. The term does not include wholly inert items; improvised explosive devices; and nuclear weapons, nuclear devices, and nuclear components, other than nonnuclear components of nuclear devices that are managed under the nuclear weapons program of the Department of Energy after all required sanitization operations under the Atomic Energy Act of 1954 (42 U.S.C 2011 et seq.) have been completed.

**Military Munitions Response Program:** The Department of Defense developed the Military Munitions Response Program in 2001 to address munitions-related concerns, including explosive safety, environmental, and health hazards from releases of unexploded ordnance, discarded military munitions, and munitions constituents found at locations other than operational ranges on active and Base Realignment and Closure installations and Formerly Used Defense Sites properties. The Military Munitions Response Program addresses non-operational range lands with suspected or known hazards from munitions and explosives of concern which occurred prior to September 2002 but are not already included with an Installation Response Program site cleanup activity.

**Munitions Constituents:** Any materials originating from unexploded ordnance, discarded military munitions, or other military munitions, including explosive and non-explosive materials, and emission, degradation, or breakdown elements of such ordnance or munitions.

**Munitions Debris:** Remnants of munitions (e.g., fragments, penetrators, projectiles, shell casings, links, fins) remaining after munitions use, demilitarization, or disposal.

**Munitions and Explosives of Concern:** Specific categories of military munitions that may pose unique explosives safety risks, such as:

- (1) Unexploded ordnance (i.e., military munitions that have been primed, fused, armed, or otherwise prepared for action; have been fired, dropped, launched, projected, or placed in such a manner as to constitute a hazard to operations, installations, personnel, or material; and remain unexploded, whether by malfunction, design, or any other cause);
- (2) Discarded military munitions (i.e., military munitions that have been abandoned without proper disposal or removed from storage in a military magazine or other storage area for the purpose of disposal); or
- (3) Munitions constituents present in high enough concentrations to pose an explosive hazard.

**Munitions Response Area:** Any area on a defense site that is known or suspected to contain unexploded ordnance, discarded military munitions, or munitions constituents. Examples are former ranges and munitions burial areas. A Munitions Response Area comprises one or more Munitions Response Sites.

**Munitions Response Site:** A discrete location within a **Munitions Response Area** that is known to require a munitions response.

**National Oil and Hazardous Substances Pollution Contingency Plan:** The plan revised pursuant to 42 United States Code 9605 and found at 40 Code of Federal Regulation 300 that sets out the plan for hazardous substance remediation under the Comprehensive Environmental Response, Compensation, and Liability Act. These regulations, often referred to as the National Contingency Plan, provide the federal government the authority to respond to the problems of abandoned or uncontrolled hazardous waste disposal sites, as well as to certain incidents involving hazardous wastes (e.g., spills). The National Contingency Plan designates the Department of Defense as the removal response authority for ordnance and explosives hazards.

**No Action:** A No Action response is selected for a site when information indicates that no additional investigation or remediation is required by the Department of Defense and no unacceptable risk to human health and/or the environment from the former military use exists or remains.

**Proposed Plan:** This is a plan that identifies the proposed decision for a site and is made available to the public for comment.

**Remedial Action Objective:** A Remedial Action Objective is a site-specific, initial clean-up objective that is established based on the nature and extent of impacts, the resources that are currently and potentially threatened, and the potential for human and environmental exposure.

**Remedial Investigation:** A process undertaken by the lead agency to determine the nature and extent of the problem presented by a potential release. The Remedial Investigation emphasizes data collection and site characterization, and is generally performed concurrently and in an interactive fashion with the Feasibility Study, if one is needed. The Remedial Investigation includes sampling and monitoring, as necessary, and the gathering of sufficient information to determine the necessity for remedial action and to support the evaluation of remedial alternatives.



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