PROPOSED PLAN
For Proposed Remedy Changes at Operable Unit 2
The New Brighton/Arden Hills Superfund Site
Ramsey County, Minnesota
FINAL

PUBLIC COMMENT PERIOD

Written comments will be accepted during the 30-day public comment period, which will occur during the following days:

January 8, 2014 through February 10, 2014

ADMINISTRATIVE RECORD FILE

For more information, see the Administrative Record file, available at the following location:

Twin Cities Army Ammunition Plant (Office)
470 West Highway 96, Suite 100
Shoreview, MN 55126
Hours: 8:00 AM to 3:00 PM
Monday through Friday

For directions call:
(651) 294-4930

INTRODUCTION

This ***Proposed Plan***[1] identifies the United States Army (Army) proposed changes to certain remedies for soil contamination in ***Operable Unit 2*** (OU2) at the New Brighton/Arden Hills (NB/AH) Superfund Site. The Site, which includes the ***Twin Cities Army Ammunition Plant*** (TCAAP), is located in Arden Hills, Minnesota. This Proposed Plan was prepared in consultation with the United States Environmental Protection Agency (USEPA) and the Minnesota Pollution Control Agency (MPCA).

Remedial action requirements were previously set forth in the 1997 OU2 ***Record of Decision*** (ROD), signed by the Army, USEPA, and MPCA. This Proposed Plan covers soil contamination at areas of concern that were not previously addressed (Site A, 135 Primer/Tracer Area, and EBS Areas), though the Site A soil contamination was located immediately adjacent to a prior and much larger Site A remediation area conducted in 1998/1999. This Proposed Plan identifies the Army's ***preferred alternative*** for final remedy at these soil areas of concern where a soil ***Removal Action*** has already been completed. The proposed amended remedy will document that the completed Removal Action constitutes the final remedy for these soil areas of concern, and will also document that the final remedy includes a ***land use control*** to restrict property uses to those that are compatible with industrial use.

Under the authority of the ***Comprehensive Environmental Response, Compensation and Liability Act*** (CERCLA), 42 U.S. Code, Section 9601, et. seq. and Executive Order 12580, the Army is the lead agency for response actions at this Superfund

[1]Words shown in bold italics are defined in the glossary at the end of the document.

Site. All remedial actions are subject to the provisions of the ***Federal Facility Agreement*** (1987) among the Army, USEPA, and MPCA.

The soil areas of concern are located within the OU2 boundary (Figure 1). The soil areas of concern were not identified as potential areas of concern in the initial TCAAP investigations, and soil contamination in these areas was identified after the 1997 ROD was signed (noting that the larger Site A contamination area that was addressed in 1998/1999 was identified in the 1997 ROD). These soil areas of concern were all addressed as ***Removal Actions*** under CERCLA, 42 U.S. Code, Section 9601, et. seq. The Removal Action cleanup levels were based on industrial use scenarios, and a ***land use control*** to restrict property uses to those that are compatible with industrial use is part of the remedy.

The Army is issuing this ***Proposed Plan*** as part of its public participation responsibilities under Section 117 of CERCLA and the ***National Oil and Hazardous Substances Contingency Plan*** (NCP), §300.430(f)(2). This Proposed Plan summarizes information that can be found in greater detail in the *Engineering Evaluation / Cost Analysis, Soil Investigations at Areas of Concern, Site A, 135 Primer/Tracer Area, EBS Areas, New Brighton/Arden Hills Superfund Site, November 2012* (subsequently referred to as the EE/CA); in the *Removal Action Completion Report for Soil Areas of Concern, Site A, 135 Primer/Tracer Area, EBS Areas, New Brighton/Arden Hills Superfund Site, November 2013*; and in other documents contained in the ***Administrative Record*** for the NB/AH Superfund Site. Site documents are available for public review at the location shown in the box on page 1, which also describes public participation opportunities associated with this Proposed Plan. The USEPA, in consultation with the MPCA and the Army, will select the final remedy after reviewing and considering information submitted during the 30-day public comment period. The public is encouraged to review and comment on the ***preferred alternative*** presented in this Proposed Plan.

SITE BACKGROUND

The NB/AH Site consists of a 25-square mile area located in Ramsey County, Minnesota. This includes the approximately 4-square mile area of the original TCAAP facility and portions of seven nearby communities: New Brighton, Arden Hills, St. Anthony, Shoreview, Mounds View, Columbia Heights, and Minneapolis. TCAAP was constructed in 1941 to produce small-caliber ammunition for the United States military. Production activities included manufacturing small arms ammunition and related materials, proof-testing small arms ammunition and related items as required, and handling and storing strategic and critical materials for other government agencies. Ammunition production and related activities occurred periodically, commensurate with operations in wars, conflicts, and other national emergencies, and ceased in 2005.

In 1983, the site was put on the ***National Priorities List*** (NPL) because USEPA and MPCA determined that hazardous substances from TCAAP had been released into the environment. The NB/AH site was divided into three ***operable units***. OU2 consists of affected soil, sediment, surface water, and groundwater within the boundaries of the TCAAP facility that were impacted by waste materials such as ***volatile organic compounds*** (VOCs), heavy metals, and explosives as a result of site operations and/or waste management and disposal activities that occurred in the period from 1941 to 1981. Figure 1 shows the location of TCAAP and its boundary in 1983 (i.e., the OU2 boundary) and the location of the soil areas of concern that are addressed in this Proposed Plan.

SITE CHARACTERISTICS

The soil areas of concern at Site A and the 135 Primer/Tracer Area exist in a TCAAP geologic layer referred to as Unit 1, which consists of several lacustrine deposits overlying Unit 2. Unit 2 is a glacial till which acts as a confining layer over a sand layer (Unit 3). The EBS Areas are located in Unit 2. In the Site A vicinity, Unit 1 groundwater is present at depths in the range of 10 to 20 feet below the ground surface. Groundwater is shallow in the 135 Primer/Tracer Area, and typically ranges from several feet in the western portion to at or near the surface in the northeast portion. In the vicinity of the EBS areas, Unit 2 (confining layer) extends to the ground surface, and the depth to groundwater (Unit 3) is approximately 100 feet. There are no surface water bodies within or immediately adjacent to the soil areas of concern.

The soil areas of concern are all located on federally-owned property controlled by the U.S. Army. Site A and the EBS Areas are located on property where control has been delegated to the National Guard Bureau, which in turn has licensed use of the property to the Minnesota Army National Guard. The National Guard property is fenced and has restricted access through padlocked gates. The 135 Primer/Tracer

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Area is located on property where control has been delegated to the Base Realignment and Closure Division (what remains of TCAAP). The 135 Primer/Tracer Area is bounded by chain-link fence.

SCOPE AND ROLE OF THE ACTION

OU2 is one of three OUs identified for the NB/AH site, which are described below. Note that references to on- and off-TCAAP in this section refer to the TCAAP boundary that is depicted on Figure 1.

Operable Unit 1 - OU1 consists of the North Plume of off-TCAAP contaminated groundwater. A 1993 ROD addressed remediation of the North Plume. A 2006 OU1 ROD Amendment sets forth changes in evaluating how to demonstrate the effectiveness of the remedy.

Operable Unit 2 - OU2 consists of on-TCAAP soil, sediment, surface water, and groundwater. The OU2 ROD was issued in 1997. ROD Amendment #1 for Site C-2 (a portion of Site C) was finalized in 2007. ROD Amendments #2 and #3, along with ***Explanation of Significant Difference*** (ESD) #1 and #2 were all finalized in 2009 and documented final remedies at various soil and dump sites and also addressed ***land use controls*** at various soil, groundwater, and dump sites. ROD Amendment #4 was finalized in 2012 and documented final remedies at various aquatic sites, two soil sites, and Building 102 shallow groundwater. This ***Proposed Plan*** addresses soil areas of concern where a ***Removal Action*** has been completed (Site A, 135 Primer/Tracer Area, and EBS Areas), documenting that the completed Removal Action constitutes the final remedy for these soil areas of concern (along with a land use control to restrict property uses to those that are compatible with industrial uses).

Operable Unit 3 - OU3 consists of the South Plume of off-TCAAP contaminated groundwater. A ROD was issued for OU3 in September 1992. A 2006 OU3 ROD Amendment was issued to address changes in the extraction and treatment remedy.

SUMMARY OF SITE RISKS

The completed Removal Action resulted in removal of soils that exceeded the cleanup levels established at each area of concern (Table 1). For Site A, given that the areas of concern were immediately adjacent to the prior Site A remediation area conducted in 1998/1999, the same cleanup levels as established for the 1998/1999 work were selected for the Site A areas of concern. These cleanup levels were based on a TCAAP site-specific industrial exposure scenario. For the areas of concern at the 135 Primer/Tracer Area and EBS Areas, the cleanup levels were based on MPCA Soil Reference Values (SRVs), which are risk-based human health criteria for exposure to contaminated soil under various scenarios, including industrial and residential. For the 135 Primer/Tracer areas of concern, if the MPCA Tier 1 Soil Leaching Value (SLV) for a given contaminant of concern was lower than the SRV, then the SLV was used. SLVs are based on the exposure pathway of contaminants leaching to groundwater. SLVs were not deemed appropriate at the EBS areas, given the presence of Unit 2 at the ground surface and given the large depth to Unit 3 groundwater.

Given that the completed Removal Action at the soil areas of concern removed the soils that exceeded industrial use cleanup levels, there is no remaining risk at these areas provided that land uses are compatible with the industrial use scenario. A land use control to restrict property uses to those that are compatible with industrial use is part of the remedy.

REMEDIAL ACTION OBJECTIVES

The ***remedial action objectives*** (RAOs) that were established in the EE/CA for the Removal Action at the soil areas of concern were: 1) to protect human receptors from unacceptable risk associated with ingestion and dermal contact exposure to contaminants in the shallow soils; and 2) to prevent leaching of contaminants from shallow soils to groundwater at levels that would cause unacceptable risk to human groundwater receptors. The completed Removal Action achieved these objectives, subject to the land use control to restrict property uses to those that are compatible with industrial use.

SUMMARY OF ALTERNATIVES

Prior to implementing the Removal Action at the soil areas of concern, three potential ***alternatives*** were evaluated in the EE/CA:

Alternative 1: No Action (except land use controls)

Alternative 2: Soil Cover

Alternative 3: Excavation and Offsite Disposal

Alternative 1 (No Action) was included to provide a baseline alternative for comparison to other action-

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oriented alternatives, and consisted of only implementing a ***land use control*** to restrict any activities that would involve digging into or contacting bare soil in the contaminated soil areas. Alternative 2 consisted of placing a soil cover over the areas of contamination to prevent contact, with installation of a perimeter of warning signs cautioning against digging in or disturbing the cover. This alternative also included implementation of a land use control to restrict any activities that would involve digging into the soil cover area, and also to restrict activities in other areas (outside the cover) to those that would be compatible with industrial use. Alternative 3 consisted of excavating the contaminated soils at the areas of concern, stabilizing the metals-contaminated soils (if necessary), and transporting the soils to a Subtitle D landfill. This alternative also included implementation of a land use control to restrict property uses to those that are compatible with industrial use.

COMPARISON OF ALTERNATIVES

A comparative analysis of the above three potential ***alternatives*** was included in the EE/CA, and is summarized below.

Overall Protection of Human Health and the Environment. Alternative 1 would not reliably protect human health and the environment, even with land use controls (LUCs) in place. Without removal or covering of the contaminated soils, potential for exposure to the contaminants would remain, particularly given the surficial presence of the contamination. Alternative 2 would be protective of human health and the environment; however, the contaminated soils would remain onsite, resulting in some residual (but minimal) risk. Alternative 3 would also be protective of human health and the environment, since the contaminated soils that exceed industrial cleanup levels are removed from the site. However, since there are soils that are above Residential SRVs (but below Industrial SRVs) remaining onsite, Alternative 3 includes a LUC to restrict property use in these areas to uses that are compatible with industrial use, which precludes certain property uses (e.g., residential).

Compliance with Applicable or Relevant and Appropriate Requirements (ARARs). Alternative 1 (No Action) is not evaluated with respect to ARARs. Alternatives 2 and 3 would both comply with ARARs.

Long-Term Effectiveness and Permanence. Alternative 1 is considered to have poor long-term effectiveness since human health would not be reliably protected and compliance with RAOs would not be achieved. Without removal or covering of the contaminated soils, potential for exposure to the contaminants would remain, particularly given the surficial presence of the contamination. Alternative 2 is considered to have good long-term effectiveness; however, the contaminated soils would remain onsite, requiring long-term management and LUCs. The long-term effectiveness is also somewhat lessened due to the potential for conflict with future property redevelopment, should that occur (i.e., development that disturbs the soil cover would be precluded). Alternative 3 is also considered to have good long-term effectiveness, though the contamination is transferred to another location. Even though the contamination is transferred to another location, the long-term effectiveness is still considered relatively good because landfills are managed, well-regulated, and environmentally-controlled facilities. Since there are soils that are above Residential SRVs (but below Industrial SRVs) remaining onsite, Alternative 3 includes a LUC to restrict property use in these areas to uses that are compatible with industrial use, which precludes certain property uses (e.g., residential). The long-term effectiveness of this LUC is considered good, given its incorporation into the OU2 Land Use Control Remedial Design (LUCRD).

Reduction of Toxicity, Mobility, or Volume Through Treatment. Alternative 1 would provide no reduction of toxicity, mobility, or volume. Alternative 2 would not reduce toxicity or volume, but would reduce mobility by limiting exposure of the contaminated soils to transport by wind, surface water runoff, or human or animal activities. Alternative 3 would not reduce toxicity or volume, but would reduce mobility by removing the soils from the Site and placing them in a landfill, which is a managed, well-regulated, and environmentally-controlled facility. For the portion of the soils treated with a stabilizing agent for metals, the mobility of the metals is further reduced.

Short-Term Effectiveness. Alternative 1 would not include any disturbance or construction, and thus would have the lowest short-term risk to site workers, the community, and the environment. Alternatives 2 and 3 include construction work, so there would be a greater risk to site workers.

Implementability. From a technical perspective, Alternative 1 would be easy to implement. However, administratively, Alternative 1 would be very difficult given that it is anticipated to be unacceptable to the USEPA, MPCA, and the community. Comparing Alternatives 2 and 3, they are both similar in the

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amount of administrative and technical effort required. Both alternatives would require preparation of work plans, contracting of labor and equipment, sampling and oversight, and implementation of LUCs, though all of these elements are relatively straight-forward and have been implemented at other TCAAP sites.

Cost. Present worth costs (2008 dollars) for the three alternatives in order of increasing cost are as follows:

Alternative 1	$40,000
Alternative 2	$250,000
Alternative 3	$300,000

These include initial implementation costs, along with long-term annual costs (if applicable).

State Acceptance. The State, with its approval of the EE/CA on November 1, 2012, has indicated its acceptance of Alternative 3.

Community Acceptance. Community acceptance will be evaluated following receipt and evaluation of all public comments at the conclusion of the community participation process.

The EE/CA recommended Alternative 3 (Excavation and Offsite Disposal) for remediation of the soil areas of concern. This alternative was noted to protect human health and the environment, meet ***Applicable or Relevant and Appropriate Requirements*** (ARARs), and accomplish the ***remedial action objectives***. The No Action alternative was not deemed acceptable because it would not reliably protect human health. Excavation and Offsite Disposal was selected over the Soil Cover alternative because, at comparable (though somewhat higher) cost, the Excavation and Offsite Disposal alternative would not conflict with any potential future property redevelopment of these areas (whereas the Soil Cover alternative clearly would), as long as that future development is consistent with the industrial use cleanup levels. It was also selected because the contamination would not remain on the property and because long-term soil cover management would not be required. An invitation for public comment on the EE/CA and its recommended alternative was published in November 2012. The Army then prepared the Action Memorandum, signed December 18, 2012, which selected the recommended remedy in the EE/CA. The remedy was implemented in May-June 2013, and the Removal Action Completion Report documenting this work was approved by the USEPA and MPCA on November 15, 2013.

The completed May-June 2013 ***Removal Action*** removed the soils that exceeded industrial use cleanup levels, and there is no remaining risk at these areas provided that land uses are compatible with the industrial use scenario. A land use control to restrict property uses to those that are compatible with industrial use is part of the remedy.

SUMMARY OF THE PREFERRED ALTERNATIVE

The ***preferred alternative*** for final remedy at these soil areas of concern is the Removal Action that has already been completed. The proposed amended remedy will document that the completed Removal Action constitutes the final remedy for these soil areas of concern, and also document that the final remedy includes a land use control to restrict property uses to those that are compatible with industrial use.

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COMMUNITY PARTICIPATION

The Army provides information about the TCAAP OU2 remediation through public meetings, the ***Administrative Record*** file, and announcements in the local newspapers. The dates for the public comment period and the location of the Administrative Record file are provided on the front page of this ***Proposed Plan***. The Administrative Record file contains a list of documents containing findings and recommendations pertaining to the remedy addition identified in this Proposed Plan.

The USEPA, in consultation with the MPCA and the Army, will make a final decision on the changes to the remedy for OU2 after the public has had an opportunity to comment. Public comment may lead the USEPA and MPCA to modify the proposed changes to the remedy. Therefore, the public is encouraged to gain a more comprehensive understanding of the site and comment on this Proposed Plan during the public comment period. All written comments received during the public comment period will be considered in making a final decision.

All written comments received will be addressed in a responsiveness summary, which will be included as part of the ROD Amendment, and will become part of the site's Administrative Record, in accordance with Section 300.825(a)(2) of the NCP, after the ROD Amendment is signed.

Comments or questions about any of the information presented in this Proposed Plan may be directed to:

Mike Fix
Commander's Representative
Twin Cities Army Ammunition Plant
651-294-4930

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GLOSSARY

Administrative Record – A body of documents USEPA uses to form the basis for selection of a response.

Alternative – An option for reducing site risk by cleaning up or otherwise limiting exposure to contamination.

Applicable or Relevant and Appropriate Requirements *(ARARs)* – Federal, state, and local environmental and public health laws with which remedial action alternatives must comply.

Comprehensive Environmental Response, Compensation, and Liability Act *(CERCLA)* – A federal law passed in 1980 and revised in 1986 by the Superfund Amendments and Reauthorization Act. CERCLA created a special tax that goes into a trust fund, commonly known as "Superfund," to investigate and clean up abandoned or uncontrolled hazardous waste sites.

Explanation of Significant Difference – A document explaining a significant change to the component(s) of a remedy that can be made without fundamentally altering the overall cleanup approach.

Federal Facility Agreement – An agreement between a department of the federal government, USEPA and state that facilitates the cleanup of a federally owned facility.

Land Use Control *(LUC)* – Legal restriction to control or restrict present and future use.

National Oil and Hazardous Substances Contingency Plan *(NCP)* – The USEPA's regulation governing all cleanups under the Superfund program.

National Priorities List *(NPL)* – USEPA's list of the most serious uncontrolled or abandoned hazardous waste sites identified for possible long-term remedial response.

Operable Unit *(OU)* – A distinct portion of a Superfund site or a distinct action at a Superfund site. A number of operable units can be used in the course of a site cleanup.

Preferred Alternative or Preferred Amended Alternative – Out of all the alternatives considered, the preferred alternative is the alternative that is proposed to remediate the site.

Proposed Plan – A document requesting public input on a proposed remedial alternative.

Record of Decision *(ROD)* – A document that is a consolidated source of information about the site, the remedy selection process, and the selected remedy for a cleanup under CERCLA.

Remedial Action Objectives *(RAOs)* – Medium-specific (for example, soil, sediment, groundwater, surface water) goals for protecting human health and the environment.

Removal Action – A removal action is usually a short-term effort designed to stabilize or cleanup a hazardous waste site that poses an immediate threat to human health, or the environment.

Twin Cities Army Ammunition Plant *(TCAAP)* – Facility constructed by the federal government in 1941 to produce small-caliber ammunition for the United States military.

Volatile Organic Compound *(VOC)* – A group of compounds that have a tendency to evaporate when exposed to air. VOCs disappear more rapidly from surface water than groundwater, since groundwater does not usually come in contact with air. When present in drinking water, some VOCs pose a potential threat to human health. Some VOCs are believed to cause cancer in humans.

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Table 1
Cleanup Levels Established in the EE/CA

Soil Areas of Concern (Site A, 135 PTA, EBS Areas)

Chemicals of Concern (COCs) for each Area of Concern (AOC)	Industrial SRV (mg/kg)	Tier 1 SLV (mg/kg)	Recommended Remediation Goal (RRG) (mg/kg)
Site A - AOC			
Antimony		(Note 1)	**33.6**
Barium		(Note 1)	**21,745**
Copper		(Note 1)	**19,593**
Lead		(Note 1)	**1,200**
135 Primer/Tracer Area			
AOC #1			
cPAHs (BAP Equivalent)	3	10.2	**3**
Naphthalene	28	7.5	**7.5**
AOC #2			
cPAHs (BAP Equivalent)	3	10.2	**3**
MNARNG EBS Areas			
AOC #1			
Lead	700	(Note 2)	**700**
Mercury	1.5	(Note 2)	**1.5**
cPAHs (BAP Equivalent)	3	(Note 2)	**3**
AOC #2			
Antimony	100	(Note 2)	**100**
Copper	9,000	(Note 2)	**9,000**
Lead	700	(Note 2)	**700**
Mercury	1.5	(Note 2)	**1.5**

Notes:

SRV = Soil Reference Value (MPCA)

SLV = Soil Leaching Value (MPCA)

1) Due to the close proximity of the Site A - AOCs to the prior remediation work conducted at Site A in 1998/1999, the RRGs specified in the 1997 Operable Unit 2 Record of Decision (OU2 ROD) are used.

2) Due to the hydrogeologic setting at the EBS Areas, SLVs are not appropriate for setting RRGs (refer to EE/CA).

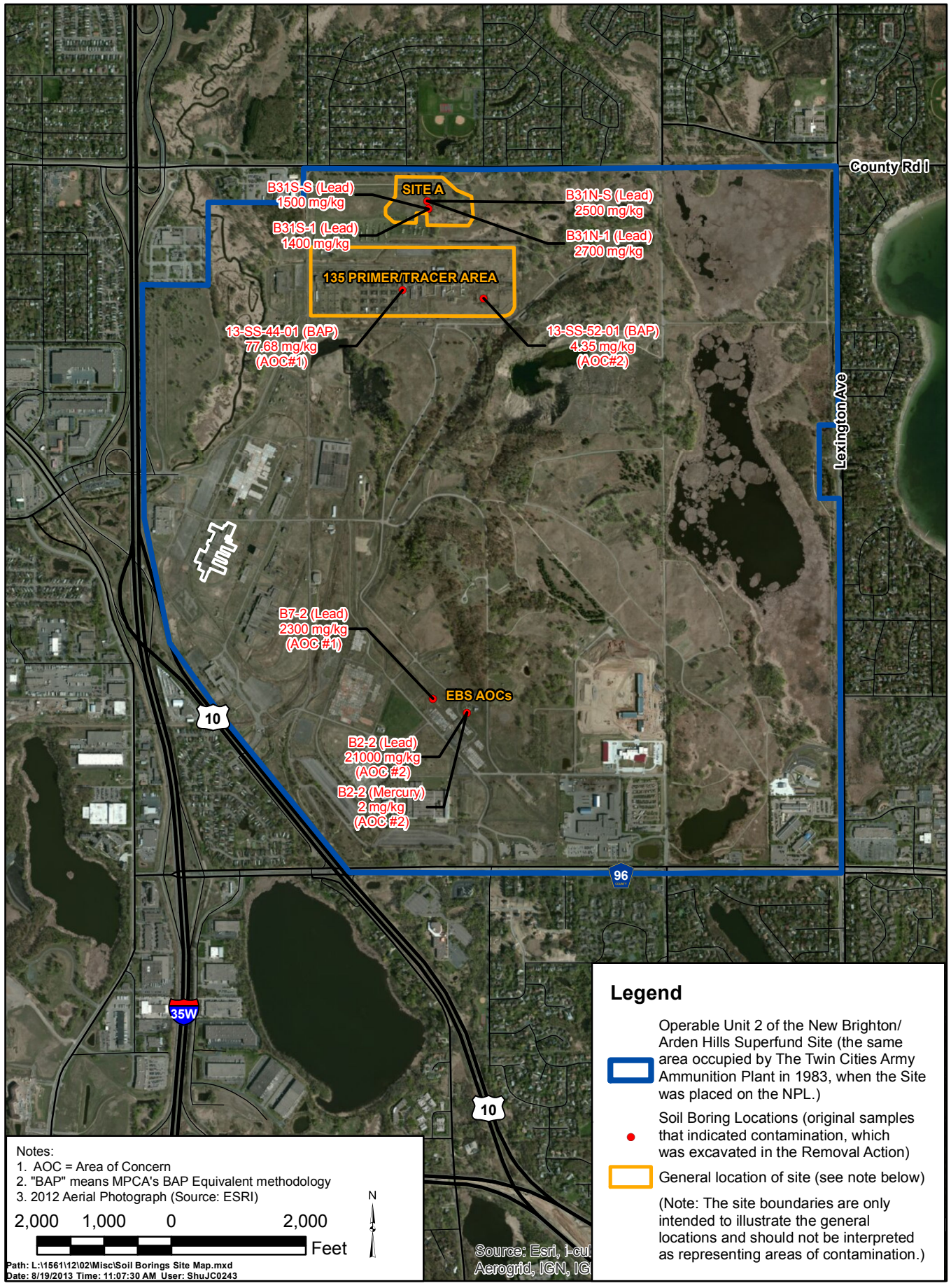

FIGURE 1. SITE MAP