Minnesota Pollution Control Agency

Off-site groundwater plumes at the New Brighton/Arden Hills Superfund Site (a.k.a. the Twin Cities Army Ammunition Plant or TCAAP)

Geographic fact sheet 62-08 • June 2012

This Minnesota Pollution Control Agency (MPCA) fact sheet for the New Brighton/Arden Hills Superfund Site (NB/AH Superfund Site), located in Arden Hills, Minnesota, will:

- summarize site historical and investigation activities conducted during the remedial investigation,
- discuss the risks to human health and the environment that may be present at the site, and
- indicate the current status of the site.

Where is the site?

The New Brighton/Arden Hills Superfund Site is in the city of Arden Hills in northeastern Ramsey County. The two contaminated groundwater plumes from this site flow under the cities of New Brighton, St. Anthony, and parts of Columbia Heights, southeast Fridley and northeast Minneapolis. The former Twin Cities Army Ammunition Plant (TCAAP) is the source of the two contaminated groundwater plumes that impact the drinking water of New Brighton and St. Anthony. The TCAAP property is bounded by County Road I on the north, Lexington Avenue on the east, County Highway 96 on the south, U.S Highway 10 on the southwest, and Interstate 35W on the west. The site encompasses 2,370 acres, or approximately 4 square miles. (See the map on page 2 of this fact sheet.)

What is the site's background?

TCAAP was constructed between 1941 and 1943 during World War II, and production at the site began in 1942. Privately owned Federal Cartridge Company operated TCAAP between 1942 and 1946, and the U.S. Army operated the plant from1946 to1950. Operation reverted to Federal Cartridge Company in 1950, and the plant continued to be operated by Army contractors until the plant's closure as a production facility in 2005.

As part of manufacturing operations at TCAAP, chlorinated solvents, also known as volatile organic compounds (VOCs), were used as degreasers. The primary VOC used was trichloroethylene (TCE). A large quantity of chlorinated solvents disposed of at sandy areas within the TCAAP property was the source for the two off-site TCE plumes.

In most parts of TCAAP, a layer of clay inhibits the downward movement of water and other material, thereby protecting the groundwater from contamination from the surface. Unfortunately, the area where the TCE was disposed lacked the protective

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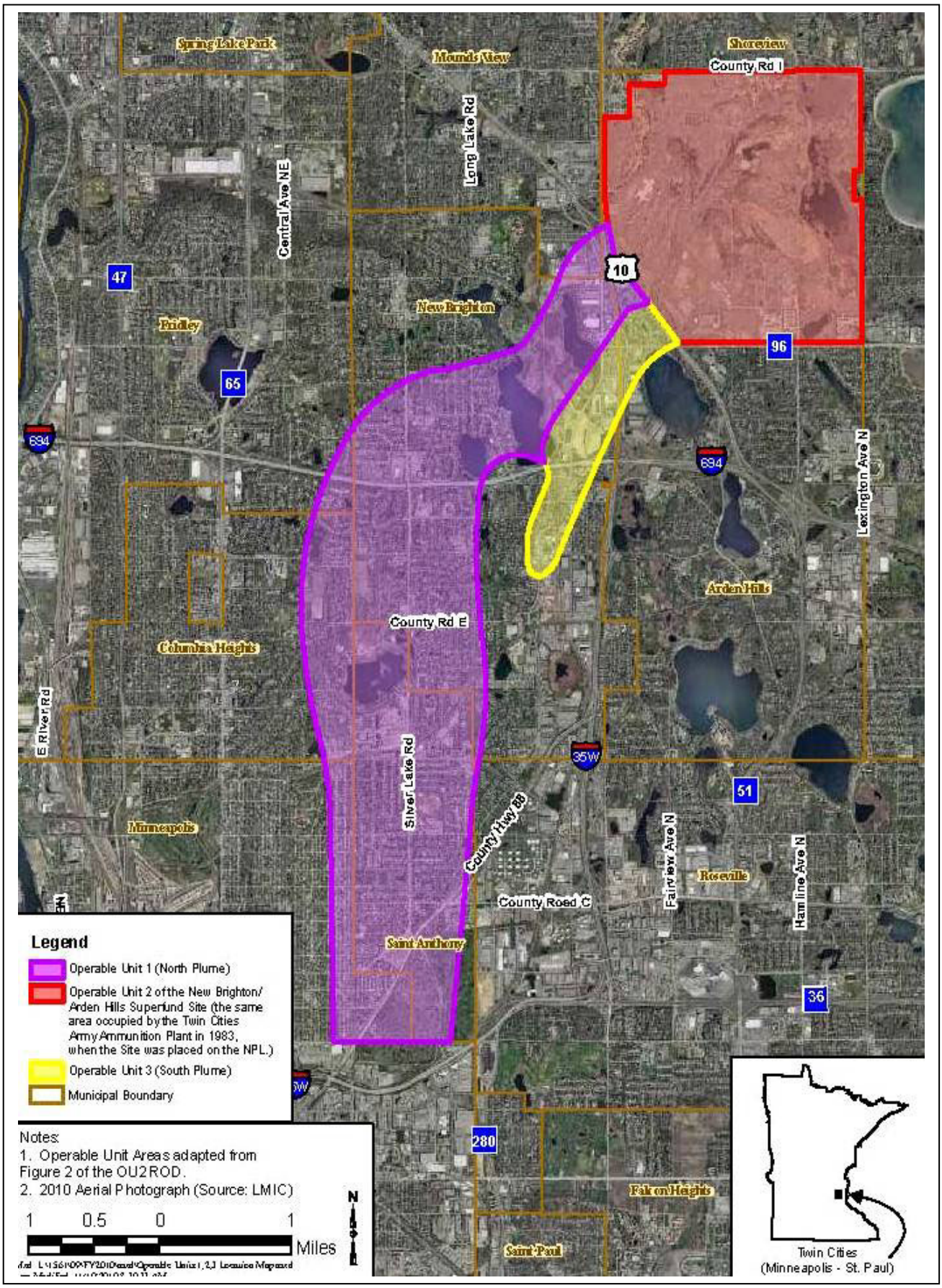
Spring Lake Park
Mounds View
Shoreview
County Rd I
Long Lake Rd
Central Ave NE
47
10
New Brighton
Fridley
65
96
694
694
Lexington Ave N
Arden Hills
County Rd E
Columbia Heights
E River Rd
35W
51
Silver Lake Rd
County Hwy 88
Minneapolis
Fairview Ave N
Roseville
Hamline Ave N
County Road C
Saint Anthony
36
280
Falcon Heights
Saint Paul
Legend
Operable Unit 1 (North Plume)
Operable Unit 2 of the New Brighton/ Arden Hills Superfund Site (the same area occupied by the Twin Cities Army Ammunition Plant in 1983, when the Site was placed on the NPL.)
Operable Unit 3 (South Plume)
Municipal Boundary
Notes:
1. Operable Unit Areas adapted from Figure 2 of the OU2 ROD.
2. 2010 Aerial Photograph (Source: LMIC)
1 0.5 0 1
Miles
N
Twin Cities
(Minneapolis - St. Paul)

clay layer. Therefore, TCE was able to flow into the groundwater that is used as a primary drinking water source of neighboring communities.

What's the groundwater cleanup history of this site?

North plume: In 1981, the MPCA and the Minnesota Department of Health sampled more than 150 drinking water wells, in Arden Hills, New Brighton and St. Anthony, and found TCE and other VOCs. Soon afterwards, the MPCA requested funds from the U.S. Environmental Protection Agency (EPA) to provide emergency drinking water to residents of the affected communities. With the EPA funding, all affected parties were provided with drinking water.

During the next few years, the EPA and the Army conducted investigations to determine the source of the TCE found in the wells, and determined that TCAAP was the source. In the meantime, as an interim measure, the EPA funded a granulated activated carbon (GAC) filtration system for New Brighton's municipal water system.

Several measures were taken in the early to mid-1980s to ensure that the communities affected are provided with safe drinking water. Those efforts are documented on the EPA Region 5 website.

In September 1983, the New Brighton/Arden Hills Superfund Site was added to the National Priorities List. The Federal Facilities Agreement (FFA) for the site was signed in August 1987 by the Army, the EPA and the MPCA. The FFA is the legally binding document that guides the remedial activities at the site. Under the agreement, the EPA has the final authority on remedial decisions at the site and the Army is legally responsible for all the remedial activities at the site.

A Record of Decision (ROD) is a public document that explains which cleanup alternatives will be used to clean up a Superfund site. The first of several RODs for the plumes impacting the drinking water supplies of New Brighton and St. Anthony was signed in May 1988. The remedy consisted of providing GAC filtration systems that remove the TCE and other VOCs from well water, for the two cities. All known private well owners in New Brighton, St. Anthony and Arden Hills were provided with safe drinking water via connections to municipal water or other means at the Army's expense.

As more of the NB/AH Superfund Site was investigated, the plume that impacts the drinking water supplies of New Brighton and St. Anthony was termed the Operable Unit 1 (OU1). In September 1993, a comprehensive ROD for OU1 was signed. The ROD was amended in 2006. The remedies for OU1 consist of:

1. Identifying and providing an alternative water supply to residents with private wells within the plume.
2. Implementing drilling advisories that would regulate the installation of new private wells within the plume as a Special Well Construction Area (see www.health.state.mn.us/divs/eh/wells/swca/tcaap.html).
3. Pumping and treating groundwater from the plume using the New Brighton municipal wells.
4. Monitoring the groundwater to verify effectiveness of the remedy.

Currently, water from six New Brighton municipal wells is being pumped and treated by GAC filtration to remove the VOCs before it is released for public use. The groundwater treatment system pumps about 1.2 billion gallons per year. The current system has been in place since 1996, and as of 2011 it had removed more than 22,250 pounds of VOCs.

South plume: In the early 1990s, it became clear that there is a smaller plume of contaminated groundwater to the south of the main plume. This plume became the Operable Unit 3 (OU3) of the NB/AH Superfund Site. The ROD for OU3 was signed in September 1992 and amended in August 2006. At first, the remedy consisted of pumping water from one New Brighton municipal well to capture groundwater with TCE concentrations above the drinking water standard of 5 micrograms per liter (µg/L). The extracted water was sent thru a GAC filtration system to remove the VOCs. By the late 1990s, the TCE concentration at the well had dropped below 5 µg/L, and pumping was halted in 2001.

TCE levels above the drinking water standard were present beyond the extraction well, but had been declining over time. This led to the hypothesis that the TCE was naturally breaking down. The ability of naturally occurring bacteria to break down TCE and similar pollutants, such as tetrachloroethylene (PCE), has been well documented. The Army and the regulators conducted a thorough review of the groundwater biology and chemistry and demonstrated that naturally occurring chemicals within the groundwater were helping degrade the TCE into harmless compounds.

In 2006, the Army proposed to implement monitored natural attenuation (MNA) as the sole remedy for the OU3 plume. The MPCA and EPA agreed, and the OU3 ROD was amended to implement MNA as the sole remedy for the plume. The Army continues to monitor the plume to ensure it is contracting as predicted.

Current activities

The Army will continue to fund the remediation of the New Brighton municipal water supply and also conduct monthly sampling of the water. The OU1 and OU3 plumes are also monitored annually by a network of nearly 300 monitoring wells. While much progress has been made since the 1980s, the groundwater throughout the area will take a long time to reach drinking water standards. Until then, the Army will continue to monitor and take additional action if needed to protect the public.

Where can I get more information?

For more information about the New Brighton/Arden Hills Superfund Site or its remediation, contact:

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To view the documents in the MPCA's administrative record that contain more details on the cleanup activities at this site, call the MPCA at 651-296-6300 or 800-657-3864.