



US Army Corps
of Engineers

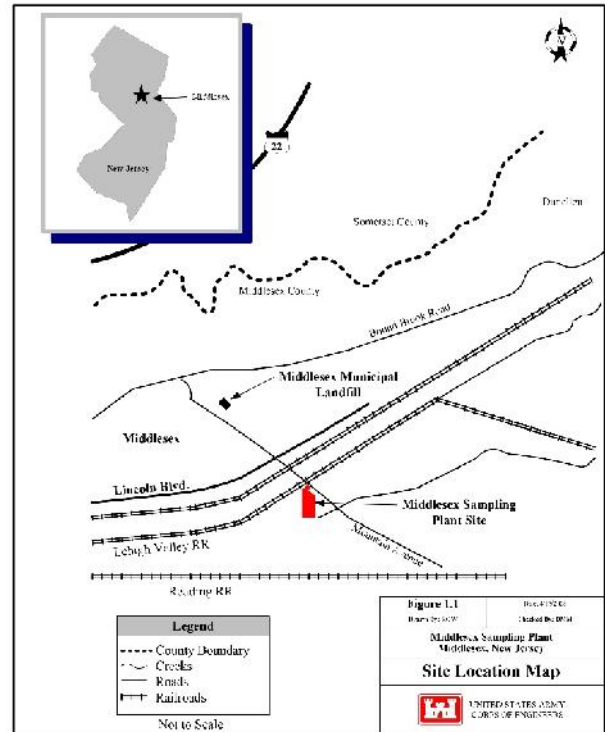
FUSRAP

Middlesex Sampling Plant

Formerly Utilized Sites Remedial Action Program
Middlesex, New Jersey

August 2020

The U.S. Army Corps of Engineers (USACE) conducted remedial investigations at the Middlesex Sampling Plant (MSP) site located at 239 Mountain Avenue in Middlesex, New Jersey. The remedial effort at the site addressed soils, sediment, surface water, and groundwater impacted by radioactive and/or chemical materials. Remedial investigations of at the MSP site were addressed under two operable units (OU1/soil and contaminated debris, and OU2/groundwater, surface water, and sediment) between 1999 to 2016. Remedial action at OU1 was completed in 2008. The remedial action for OU1 included excavation of soil and debris contaminated with radioactive and chemical waste above the criteria for residential use of the site. The excavated material was transported and disposed of off site at an approved, licensed or permitted facility. Based on findings of risk assessments completed for the MSP site, the surface water and sediment do not pose unacceptable risks. The USACE is currently working to address the remedial action for groundwater at the MSP site. The USACE has prepared this project status summary in an effort to keep you informed of work in or near your neighborhood.



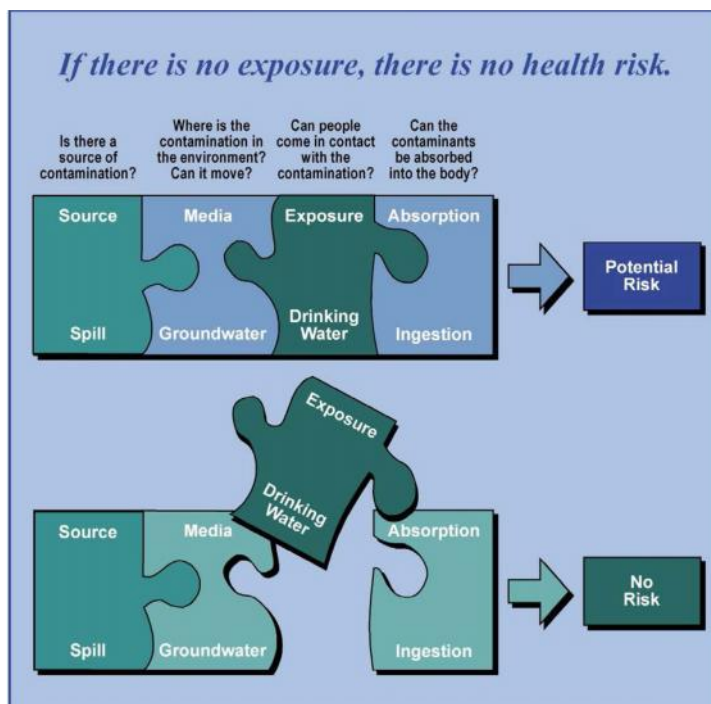
Why is the USACE looking for possible health risks? Do I need to be concerned?

The contaminants identified in the groundwater as chemicals of concern at the MSP site are volatile organic compounds (or VOCs), consisting of carbon tetrachloride (CT), trichloroethene (TCE), and chloroform in bedrock groundwater; and residual uranium in the overburden groundwater. VOCs are commonly found in various chemical products and are often used as solvents. Concentrations of uranium in groundwater were significantly reduced after soil impacted with uranium and other radionuclides were removed from MSP during the OU1 remedial action in 2008 and have not exceeded the U.S. Environmental Protection Agency's (USEPA) maximum contaminant level (MCL) for drinking water since 2012. However, uranium in groundwater will continue to be monitored.

What is an exposure pathway?

An exposure pathway is a direct link from a contamination source to humans, animals, or the environment through an exposure to contaminated air, soil, water, and food. If there is no exposure, there is no risk.

Since drinking water is an exposure pathway for the MSP site, a private potable well survey for registered wells within a half-mile of the site was completed. Groundwater samples were collected at nine properties. The analytical results for one of the samples indicated VOCs above New Jersey Department of Environmental Protection (NJDEP) drinking water criteria. This property was connected to the city water supply and the well was converted to a monitoring well.



Site-related VOCs are migrating off-site via bedrock bedding planes but they do not discharge into surface water systems and there is no pathway to ecological receptors. There are also no ecological habitats that have been identified at the MSP site.

What is the history of the contamination at the MSP site?

In 1943, the Manhattan Engineer District leased the MSP site and converted it into a process building to sample, store, test, and transfer ores containing uranium, thorium, and beryllium. Between 1943 and 1955, analysis of ores for uranium was the primary operation conducted at the MSP site. The MSP site became an intermediate point for shipment of uranium bars to a location where the bars were experimentally machined into slugs. Over the years that the MSP site was operational, the site buildings, soils and groundwater, as well as nearby land parcels, became contaminated with radium and uranium. The handling of uranium ore stacks likely results in spillage, and infiltration, caused localized radiological contamination both on and off site. Primary operations at the MSP site ceased in 1955, but the site was used for storage and limited sampling of thorium residues until all activities were terminated in September 1967.

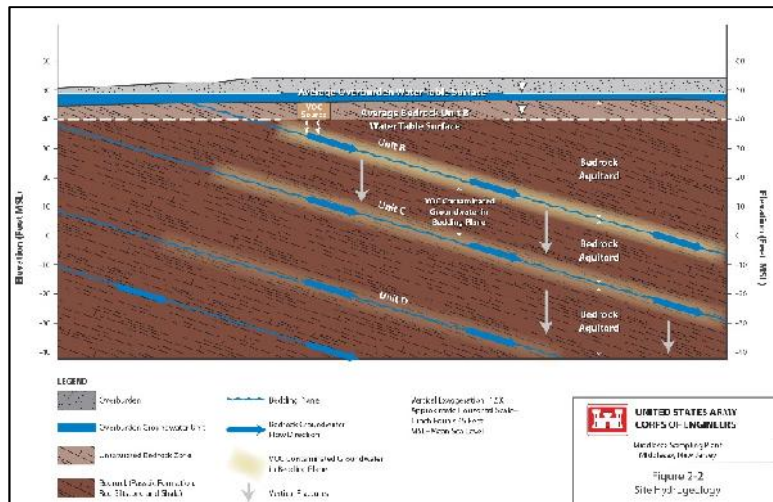
VOCs, such as CT and TCE, were likely used as degreasers or cleaning agents during onsite activities. VOCs were released into the environment through disposal on site which was an acceptable practice during historical site operations. Since the 1970s, more has become understood about the full environmental and public health impacts associated with unregulated disposal and laws have been put in place to prevent such practices.

VOC analytical results showed high concentrations for CT and lower concentrations of TCE in onsite bedrock monitoring wells. Low concentrations of other VOCs such as tetrachloroethene and methyl tertiary-butyl ether were detected in wells along the boundaries of the property and determined to be from off-site sources.

What is known about groundwater contamination at the Middlesex Sampling Plant Site?

From 2001 through 2005, a remedial investigation was performed to define the nature and extent of the contamination in the groundwater, surface water, and sediment at the MSP site. In addition, this investigation included an evaluation of the fate and transport of contaminants at the MSP site and assessment of potential human health and ecological risk. Based on the findings, only groundwater posed a potential future unacceptable risk and required further evaluation.

Investigations of the bedrock aquifer in 2010 through 2016 focused on determining the extent of VOC contamination that impacted the bedrock aquifer. The investigation identified three transmissive fractures or bedding planes that contained VOC contamination, and these were named Unit B, Unit C, and Unit D for simplicity. Wells were placed in Units B, C, and D, with well screen lengths ranging from 10 to 25 feet in length. Unit B is the shallowest bedrock fracture/bedding plane and also where the highest concentrations of VOCs were found. Units C and D are deeper, parallel, fracture/bedding plane units that are located about 25 feet and 80 feet beneath Unit B, respectively. The concentrations of VOCs detected in these units are much lower than those detected in Unit B.



In 2014 and 2015, two additional groundwater sampling events were conducted, and the monitoring wells were sampled for VOCs (both overburden and bedrock wells) and uranium (overburden wells). High concentrations of VOCs were detected in the samples from shallow bedrock wells but not from overburden wells. Although uranium was detected in overburden wells, the concentrations were below the USEPA MCL for drinking water. The low levels of uranium in the overburden groundwater samples indicate that only slight residual uranium from past operations remains in the overburden. This trend was expected after the removal of on-site soils during the OU1 remedial action completed in 2008.

What is being done to address Middlesex Sampling Plant groundwater contamination? A Feasibility Study that developed and evaluated remedial alternatives to address current or future potential health and environmental impacts from groundwater contamination was conducted. Based on this evaluation, a preferred remedy was selected among the remedial alternatives and was presented in a Proposed Plan.

The preferred remedy includes a combination of remedial technologies to address the contaminants in groundwater. In situ chemical reduction (ISCR) will be used to treat the VOCs present in the groundwater situated in the bedrock within Unit B on site in the source area. During ISCR treatment, chemically-reactive additives are injected into the ground, which transform groundwater contaminants into less harmful chemical species. As part of the remedial design, bench-scale or pilot tests will be completed to determine the most appropriate materials, concentrations, and volumes of reagents for full-scale implementation at the site. Monitored natural attenuation (MNA) will be used to monitor the levels of the on-site VOCs not influenced by active treatment, the downgradient portion of the VOC plume, and any residual uranium present in the overburden groundwater. Land-use controls (LUC), such as well restrictions in a groundwater Classification Exception Area (CEA), will be implemented in areas where groundwater contamination has been identified. The remedy will be reviewed once every five years, as long as contaminants in groundwater remain above cleanup levels that allow for unlimited use and unrestricted exposure. A 30-year treatment timeframe has been assumed for cleanup of the MSP groundwater.

The USACE and USEPA, in coordination with NJDEP, will select a final remedy for the groundwater at the MSP site that addresses the concerns and meets the needs of the local community by taking into consideration the comments received during the public comment period.

Where can I get additional information and send comments?

The USACE will continue to update local residents and other stakeholders as site management decisions related to the Middlesex Sampling Plant FUSRAP site are evaluated. The Proposed Plan and other supporting documents are available online at:

<https://www.nan.usace.army.mil/Media/Fact-Sheets/Fact-Sheet-Article-View/Article/487433/fact-sheet-middlesex-sampling-plant-msp/>

We welcome your involvement as we work to ensure the safety of the public and our on-site workers and to protect the environment. Please send any written comments on the Proposed Plan postmarked or emailed by 25 September 2020 to:

USACE c/o USEPA Region 2
ATTN: Ms. Helen Edge
2890 Woodbridge Avenue
Edison, NJ 08837
Email: Helen.K.Edge@usace.army.mil

If you have any additional questions or concerns, please contact Ms. Helen Edge, Project Manager, at (917) 790-8332; or by email at Helen.K.Edge@usace.army.mil.