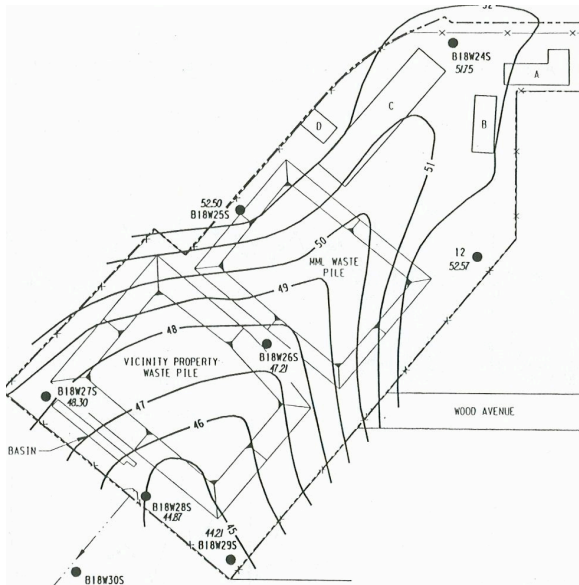


Department of Energy Contaminant Fate and Transport Evaluation Dissolved-Phase Radioactive Compounds Middlesex Sampling Plant, New Jersey



The Middlesex Sampling Plant site is located in the Borough of Middlesex, New Jersey. From 1943 to 1955, the site was primarily used for sampling, storage and shipment of uranium, thorium, and beryllium ores for the Atomic Energy Commission as a part of the United States World War II research aimed at developing nuclear capability.

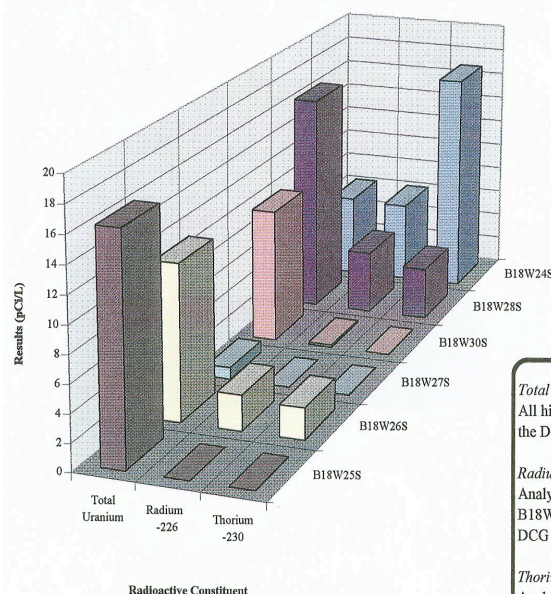
The processing of ores at the Middlesex site resulted in the creation of wastes and residues containing radioactive compounds and a variety of metals. Since the site is situated in a mixed residential/light industrial area, nearby water supply wells surrounding the site were still being used for limited water supply and gardening. Consequently, a thorough soil and shallow ground water investigation was conducted to better understand the concentration and distribution of radiological constituents across the site.

The results of the soil and ground water investigation confirmed that radioactive compounds above their permissible limits were present in the ground water and were also migrating off the site. A subsequent radiological fate and transport assessment was completed to better understand and predict the rate of contaminant migration, identify the potential future impact to nearby wells, and to design a remedial system to address the radiological constituents.

The three major impacts of this project were 1) area residents were connected to the city water supply, 2) existing water supply wells abandoned, and 3) a cost-effective, passive, in-ground treatment system, with appropriate monitoring, was designed and constructed to eliminate off-site migration of radioactive compounds.

PROJECT HIGHLIGHTS:

- ✓ **Designed and implemented a radiological fate and transport evaluation of shallow ground water contamination.**
- ✓ **Identified sensitive environmental receptors.**
- ✓ **Designed a cost-effective, passive, in-ground treatment system to address off-site migration of radioactive contamination.**
- ✓ **Worked with Borough of Middlesex Officials and Department of Energy to ensure all residents were connected to the Borough water distribution system (and not using shallow water supply wells).**



Total Uranium:
All historical and current analytical results are less than the DOE drinking water DCG of 24 pCi/L.

Radium-226:
Analytical results from wells B18W24S (6.1 pCi/L) and B18W28S (4.7 pCi/L) exceed the DOE drinking water DCG of 4 pCi/L.

Thorium-230:
Analytical results from well B18W24S (16.8 pCi/L) exceed the DOE drinking water DCG of 12 pCi/L.