



Site A/Plot M, Illinois, Decommissioned Reactor Site A D&D site

This fact sheet provides information about the **Site A/Plot M, Illinois, Decommissioned Reactor Site**. Long-term stewardship responsibilities for this site are managed by the **U.S. Department of Energy Office of Legacy Management** under the **Defense Decontamination and Decommissioning Program**.

Site Information and History

The Site A/Plot M decommissioned reactor site is located in the Palos Forest Preserve in Cook County, Illinois, 20 miles southwest of Chicago.

The Site A/Plot M area is the former site of Argonne National Laboratory and its predecessor, the University of Chicago Metallurgical Laboratory, which was part of the U.S. Army Corps of Engineers (the Corps) Manhattan Engineer District during World War II. In 1942, the Corps leased 1,025 acres of land in the Forest Preserve from the Forest Preserve District of Cook County (FPDCC). The newly constructed laboratory used two locations in the Palos preserve: Site A, a 19-acre area for experimental laboratories and nuclear reactor research facilities, and Plot M, a 150-foot by 140-foot area for burial of radioactive waste. Plot M is located about 1,500 feet north of Site A.

Site A was the operational facility for two of the nation's first nuclear reactors, referred to as Chicago Pile-2 and Chicago Pile-3 (CP-2 and CP-3).

Operations at Site A began in 1943 and ended in 1954. The first nuclear reactor to achieve a self-sustaining chain reaction, CP-1, was moved from the University of Chicago to Site A in 1943 and renamed CP-2. A second reactor, CP-3, was constructed on the site in 1943. The natural uranium fuel in CP-3 was replaced with enriched uranium (amount of uranium-235 in the fuel has been increased from its naturally occurring abundance). The redesigned reactor, named CP-3 prime (CP-3'), became operational in May 1950.

Research programs conducted at Site A included reactor physics studies, fission product separations, tritium recovery from irradiated lithium, and studies of radionuclide metabolism in laboratory animals.

Because the FPDCC was not willing to sell or permanently transfer title to Site A to the federal government, the U.S. Atomic Energy Commission (AEC, a successor agency to the Manhattan Engineer District) purchased land 6 miles northwest of Site A in 1947 to build a larger nuclear research complex, Argonne National Laboratory. By May 1954, both CP-2 and CP-3' were shut down, and all work was moved to the new complex.

When work at Site A ceased, the reactor fuel for both reactors and heavy water (water composed of mainly deuterium and oxygen instead of ordinary hydrogen and oxygen) in reactor CP-3' were removed and shipped to Oak Ridge National Laboratory, an AEC facility near Oak Ridge, Tennessee. By 1956, all buildings and equipment at Site A had been decontaminated and demolished.

Radioactive waste and radioactively contaminated laboratory articles from Site A were buried in Plot M from 1943 to 1949. Decommissioning of Plot M was completed in 1956, when an inverted concrete box was constructed over the entire burial plot. The concrete walls of the box are 18 inches thick and extend 8 feet into the ground. A 1-foot-thick concrete slab was poured over the entire disposal area. The purpose of the concrete barrier is to prevent digging from taking place at the site and to block the flow of water through the buried radioactive materials. The concrete slab was covered with approximately 2 feet of soil, grass was planted, and a granite marker, was placed in the center of Plot M.

The surface at both Site A and Plot M is considered to be clean and suitable for unrestricted recreational use. Hiking trails and a bike path pass through the sites, and a picnic area is located near Plot M. A marker placed at Site A explains the historical significance of the site.

As part of an ongoing monitoring program, Argonne National Laboratory conducts sampling at 19 groundwater locations and nine surface water locations in the Site A and Plot M areas and is responsible for sample analysis and reporting. Sampling is conducted in accordance with the Long-Term Surveillance Plan for Site A and Plot M. This document defines both the frequency for monitoring and the analysis to be performed for each monitored location.

Current Risk

FPDCC prohibits digging in the Palos Forest Preserve. Regulations also ban drilling and restrict land use to reduce the likelihood that buried waste would be exposed due to human involvement. The primary contaminants of concern in groundwater and surface water near Site A and Plot M are tritium and strontium-90.

Currently, the only complete exposure pathway to subsurface contaminants is an intermittent stream that flows for several months each spring. Potential exposure periods to contaminated groundwater and surface water are low frequency and of short duration, and observed levels of contamination do not endanger the health or safety of the public visiting the site, using the picnic area, or living in the vicinity. Potential radiation doses are well below standards.

Regulatory Setting

Site A/Plot M land is owned by the Forest Preserve District of Cook County, Illinois. DOE is responsible for subsurface radioactivity at the sites under the authority of the Atomic Energy Act of 1954 (Title 42 *United States Code* [USC], Section 2011, et seq.).

The primary guidance for surveillance of Site A/Plot M is DOE Order 458.1, *Radiation Protection of the Public and the Environment*, which establishes a radiological dose limit to members of the public. U.S. Environmental Protection Agency Drinking Water Standards in Title 40 USC Part 141 do not apply because the affected groundwater and surface water do not meet the definition of a public water supply. However, the Illinois Class I Groundwater Quality Standards (Title 35 *Illinois Administrative Code*, Subpart 620), for tritium and strontium-90 are useful contamination standards. The Illinois Emergency Management Agency Division of Nuclear Safety acts as an interested but unaffiliated third party.

Legacy Management Activities

The DOE Office of Legacy Management (LM) manages Site A/Plot M according to a site-specific Long-Term Surveillance and Maintenance plan. Management activities include annual site inspections to evaluate the condition of surface features (site vegetation and on-site and adjacent off-site erosion). LM also evaluates the groundwater and surface water to align with the LM mission to protect human health and the environment.



Marker at Site A.



CONTACT INFORMATION

IN CASE OF AN EMERGENCY AT THE SITE,
CONTACT **911**

LM TOLL-FREE EMERGENCY HOTLINE:
(877) 695-5322

Site-specific documents related to the **Site A/Plot M, Illinois, Decommissioned Reactor Site** are available on the LM website at www.energy.gov/lm/site-aplot-m-illinois-decommissioned-reactor-site

For more information about LM activities at the **Site A/Plot M, Illinois, Decommissioned Reactor Site**, contact:
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