US Army Corps of Engineers®
St. Louis District

St. Louis Sites Fact Sheet

COLDWATER CREEK SOIL SAMPLING AND ANALYSIS

"Gateway to Excellence"

Cleanup activities at the St. Louis Sites are part of a nationwide U.S. Department of Defense (DOD) Army Corps of Engineers (USACE) environmental program known as Formerly Utilized Sites Remedial Action Program (FUSRAP). FUSRAP in St. Louis includes four Missouri sites (SLDS, SLAPS, Latty, and SLAPS VPs). These sites contain soils contaminated with radium, thorium, and uranium as a result of activities associated with the Manhattan Engineer District/Atomic Energy Commission (MED/AEC) during the nation's 1940s and 1950s atomic program.

USACE uses scientific knowledge and skilled investigators to identify places along Coldwater Creek that may need cleanup. The work requires deliberate sample site selection and then precise laboratory analysis in order to prioritize cleanup actions.

To learn more about FUSRAP, contact the FUSRAP Area Office at (314) 260-3905 or write to the U.S. Army Corps of Engineers, St. Louis District, FUSRAP Area Office, 114 James S. McDonnell Blvd., Hazelwood, MO 63042

USACE selects sampling points along Coldwater Creek (CWC) with the goal of obtaining the most representative locations possible. In order to gather accurate and representative information, FUSRAP investigators collect samples from carefully chosen systematic and biased sampling locations.

SYSTEMATIC SAMPLING LOCATIONS

The systematic sample locations follow a grid based on the 10-year floodplain adjacent to CWC. USACE will collect more samples if contamination is found at the border of the floodplain, and USACE will expand sampling beyond the 10-year floodplain until the extent of contamination is clearly determined. At systematic sample locations, USACE generally collects samples from the surface to a depth of 2 to 6 feet, depending on the nature of the sample. If the location has known fill materials, workers will collect deeper samples.

A conceptual site model is a tool that engineers create and use to understand an area. The model is based on the area's history and current status. Engineers look at the area features, both on the surface and below ground level, and identify what areas may be impacted by FUSRAP contaminants.

BIASED SAMPLING LOCATIONS

The conceptual site model for CWC identifies the biased sampling locations. This model defines areas where contamination likely accumulates or is trapped or covered. These locations are based on current and historical knowledge of:

- Physical movement (like hauling and historic grading)
- Topographically low-lying areas
- Depositional areas (like where CWC bends or goes around structures)
- Distinct locations (like the mouth of a tributary or a realigned channel)

At biased locations, USACE takes samples at a depth that is appropriate for the location. For example, samples within historic tributaries will extend to the depth of the former channel.

LABORATORY ANALYSIS OF SOIL SAMPLES

After collecting soil samples, workers deliver them to a dedicated FUSRAP Laboratory, central to the St. Louis Sites. The lab is run by an independent contractor who meets the strict requirements of USACE and DOD. Because USACE requires quick analysis of site samples, this lab runs two shifts, employing 11 specially trained technicians and scientists. All laboratory instruments meet National Institute of Standards and Technology calibration standards.

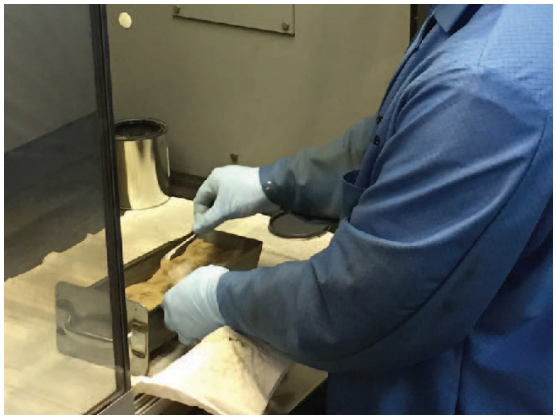
SOIL ANALYSIS STEP-BY-STEP

The FUSRAP lab tests soil (and other media) in a precise process that begins at the front door. Workers log and track field samples' movements through the lab from entry to analysis to disposal with careful documentation.

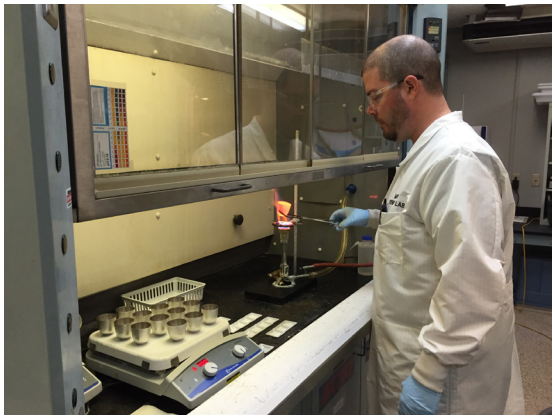
Soil is first dried overnight in an oven and then ground into a powder. After thoroughly mixing the sample, laboratory workers begin the steps to isolate any radium, thorium, or uranium isotopes.

From each site sample, separate but identical processes are run to isolate these three isotopes. Lab workers measure levels of ionizing radiation in each isolated radium, thorium, or uranium isotope. The laboratory equipment is specialized to detect ionizing radiation, which includes alpha and beta particles and gamma rays emitted from radioactive materials.

Reports from lab analysis guide USACE in meeting the remediation goals set by each site's Record of Decision.

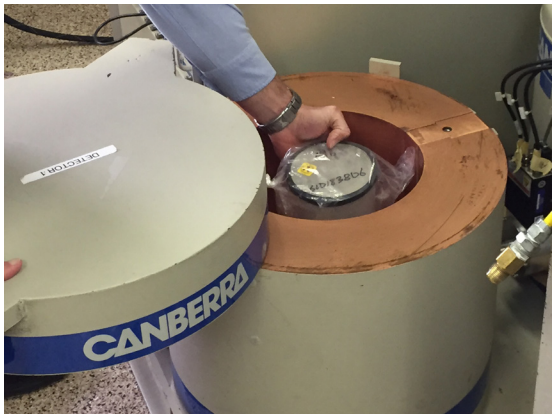


After soil and sediments are dried and ground into a powder, specially trained laboratory technicians begin the steps to isolate any radium, thorium, or uranium from a sample.



Here a specially trained laboratory technician separates thorium from other isotopes in a sample so thorium alone can be measured by alpha spectroscopy.

Technicians mount isolated thorium on a filter and insert it into the alpha spectrometer. This step tests for uranium, radium, and thorium alpha particles in samples.



Here a technician loads a soil sample into a gamma spectrometer. The instrument detects gamma rays emitted from the sample, identifies the isotopes within the sample, and measures them.