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SRNL is a DOE National Laboratory
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Technology Testbeds at Savannah River National Laboratory

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SRNL Fast Facts

- > The Savannah River National Laboratory (SRNL) has a unique set of assets that can be accessed to test innovative technologies that address Department of Energy, Office of Environmental Management (DOE-EM) high priority needs.
- > Priority DOE-EM concerns include: technetium-99 (Tc-99), mercury, cesium-137, and strontium-90.
- > SRNL RadFLEx provides a meso-scale testbed for evaluation of waste forms including characterization of radionuclide speciation, solubility, and behavior under real environmental conditions.

Contact Information

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Radionuclide Field Lysimeters (RadFLEx) Testbed

RadFLEx is a one-of-a-kind facility designed to quantify radionuclide biogeochemical behavior under field conditions at the meso-scale (cubic meter), providing test data between laboratory-scale (cubic centimeter) and field deployment scale (cubic kilometer). This testbed offers the opportunity to conduct experiments under natural rainfall, temperature and groundwater-flow field conditions.

Unlike standard field studies, RadFLEx provides the ability to replicate, control and test multiple treatments under identical conditions. As such, it is ideal for conducting waste form or remediation technology evaluations and demonstrations, as well as long-term fate-and-transport experiments.

Further, the RadFLEx testbed has the ability to incorporate in-situ instrumentation to provide detailed characterization of porewater flow and chemistry properties. With regulatory, safety and maintenance infrastructure in place, it is convenient to introduce new tests as unused experimental test modules (lysimeters) capacity becomes available

Attributes

- The RadFLEx testbed consists of 48 independent lysimeters that can support experiments of varying durations, typically between one and 10 years. As tests are completed, new tests can be readily initiated by replacing the interchangeable sleeves holding the experiments.
- Lysimeters results can provide important information regarding waste form performance, radionuclide transport and remediation technology efficacy.
- Experiments involving dozens of different radionuclides have already been conducted, supporting the evaluation of technologies and approaches related to colloid transport, plant- and microbial-enhanced transport, waste-form performance, and long-term radionuclide transport through sediment.



Dr. Dan Kaplan collecting moisture and chemical properties data.



Technology Testbeds at SRNL

Impact

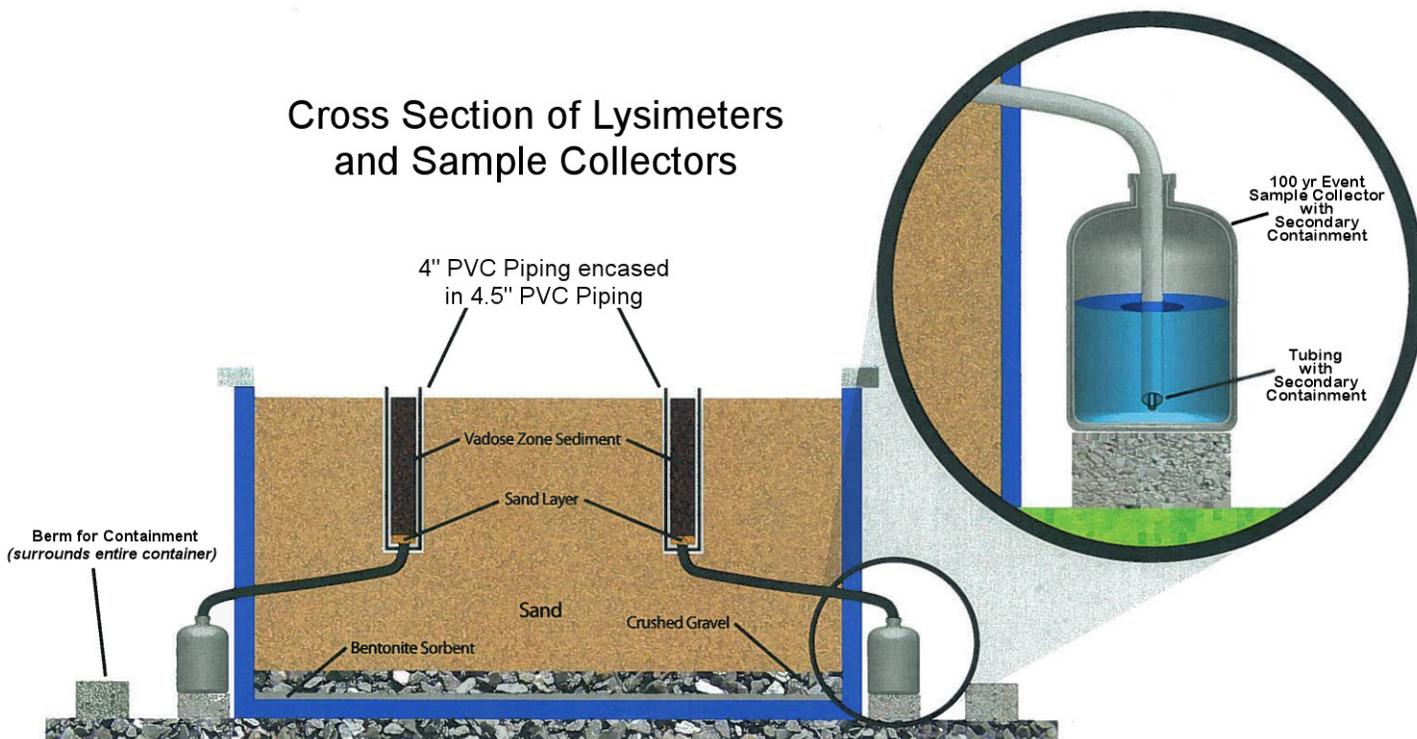
RadFLex provides knowledge for science-based decisions related to:

- Environmental remediation and monitored natural attenuation technologies and strategies
- Waste form selection and performance
- High-level and low-level waste disposal scenarios
- Performance assessment and risk model of benchmarking and validation



Radiological field lysimeter facility

Cross Section of Lysimeters and Sample Collectors



Open to natural rainfall and temperature fluctuations, RadFLex offers an opportunity to quantify long-term geological processes under controlled conditions.



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