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SRNL is a DOE National Laboratory operated by Savannah River Nuclear Solutions.

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
- The Virtual Subsurface Testbed provides a 3-D model to evaluate remediation and long-term monitoring strategies, and to evaluate boundary conditions and controlling variables which can serve as cost-effective "leading indicators" of changing groundwater conditions.

Contact Information

SRNL Office of Communications
803.725.4396

Virtual Subsurface Testbed

To ensure that contaminants remain sequestered, implementation of attenuation-based remedies requires long-term monitoring over decades. One challenge associated with the development of long-term monitoring approaches is the development of effective strategies without conducting years of monitoring.

Following years of remedial actions, SRNL has developed a "virtual" subsurface testbed at the SRS F Area site that allows for testing of strategies that incorporate measurement of controlling variables that can be monitored remotely, in addition to standard methods.

To facilitate this work, Lawrence Berkeley National Laboratory has developed a state-of-the-art, three-dimensional flow/reactive transport model and incorporated statistical analysis of years of contaminant monitoring data that can be used to predict contaminant concentrations and distribution in the future.

The well-documented changes in boundary conditions and controlling variables (i.e. basin closure and capping, and pump and treat, followed by base injection) at F Area can be used to evaluate changes as they occur over time.

Pilot field test of alternative LTM sensors

Attributes

- A well-characterized, mature groundwater plume with dissolved uranium, strontium, iodine, technetium and tritium, as well as other radionuclides and metals
- Mature conceptual site model that includes detailed information on site hydrology, geologic features and contaminant distribution
- Comprehensive monitoring history with 60 years of groundwater data with a complex, well-documented remedial history
- State-of-the art, three-dimensional flow and reactive transport model to evaluate changes into the future
- In-situ sensor network that remotely monitors key groundwater controlling variables for real-time data analysis and early warning systems

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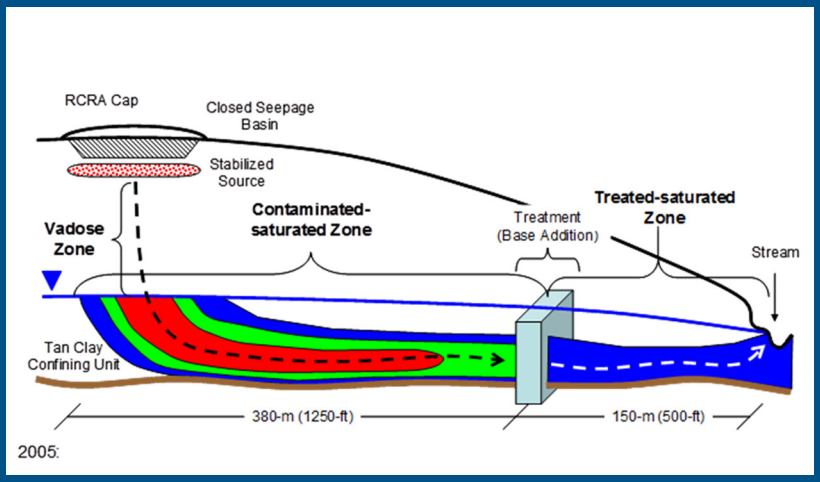
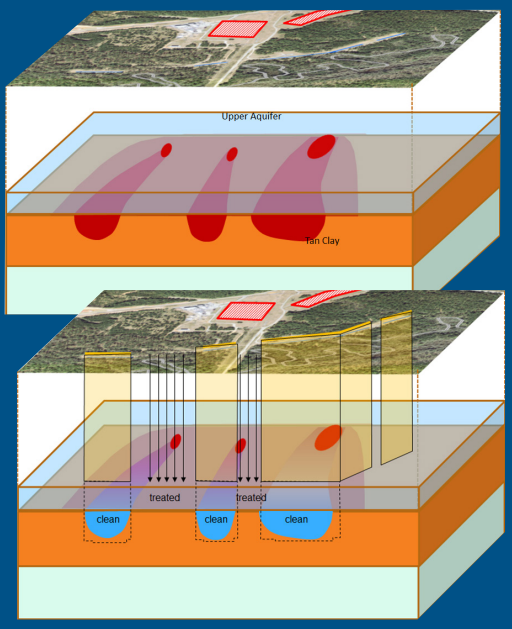
Technology Testbeds at SRNL

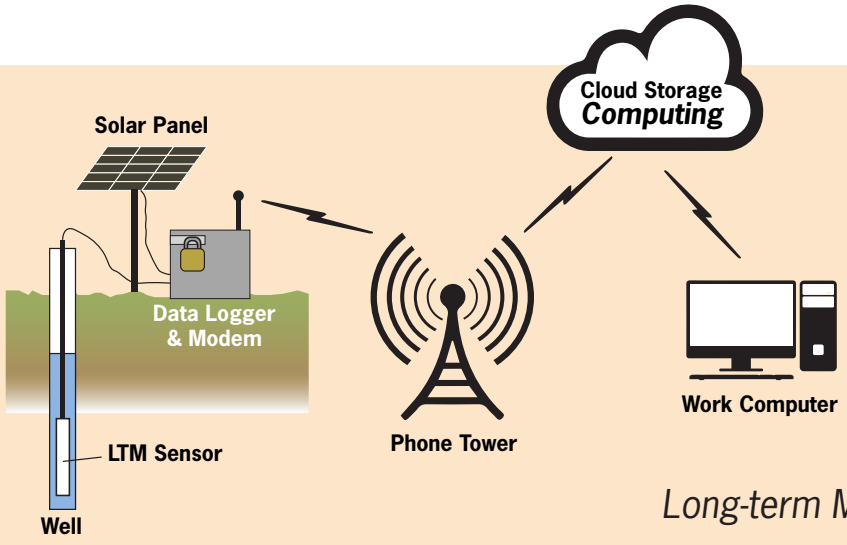
Impact

- Use of the virtual model will allow for effective testing of long-term remediation and monitoring strategies without the need for decades of testing
- Successful remediation and long-term monitoring strategies tested here will be transferable across the DOE complex





Conceptual Models and Subsurface Illustrations within the Virtual Subsurface Testbed



Long-term Monitoring Network

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