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TechBriefs

Savannah River National Laboratory

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At a glance

- > U.S. patent 6,254,785
- > In Situ
- > Accelerated clean-up
- > Lower operating and maintenance costs
- > Proven technology

Contact Information

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GeoSiphon™

Scientists at the Savannah River National Laboratory have developed innovative processes for groundwater remediation. Called the GeoSiphon™, this process offers significant advantages over pump and treat systems funnel and gate systems and continuous permeable wall treatment systems. The GeoSiphon™ cell is a passive, in situ, groundwater treatment system which uses a siphon between two points of natural head difference to induce greater than natural flow through a permeable treatment media.

GeoSiphon™ cells advance the current state of the art for reactive barriers (i.e. funnel and gate) by using natural forces to accelerate the flow of contaminated groundwater through the treatment media. The naturally accelerated flow does not require any external energy input and reduces the time necessary for complete remediation. Passive operation and reduced clean-up times can be translated directly into reduced operating and monitoring costs.



Background

A GeoSiphon™ cell was installed in August 1997 at the Savannah Rive Site (SRS) to demonstrate the technology for the remediation of chlorinated volatile organic compounds (CVOCs), such as trichloroethylene (TCE), using granular cast iron. The cell is eight feet in diameter, 20 feet deep, and contains 100,000 lbs. of granular cast iron made from recycled engine blocks, transmissions, etc. Results from the first test using a siphon show that the technology is capable of sustaining flows of 8 gallons per minute and degrading 200 ug/L TCE to <5 ug/L. Other CVOCs that were successfully degraded include, carbon tetrachloride and chloroform. Results from the demonstration can be found in Phifer, M. A., R.L. Nichols, F.C. Sappington, J.L. Steimke, and W. E. Jones. GeoSiphon groundwater remediation system hydraulics. Environmental Geosciences, v.12, No. 1, pp 1-16, 2005.



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Technology transfer

The Savannah River National Laboratory (SRNL) is the U.S. Department of Energy's (DOE) applied research and development laboratory at the Savannah River Site (SRS).

With its wide spectrum and expertise in areas such as homeland security, hydrogen technology, materials, sensors, and environmental science, SRNL's cutting edge technology delivers high dividends to its customers.

The management and operating contractor for SRNL is Battelle Savannah River Alliance, LLC. BSRA is responsible for transferring its technologies to the private sector so that these technologies may have the collateral benefit of enhancing U.S. economic competitiveness.

Advantages

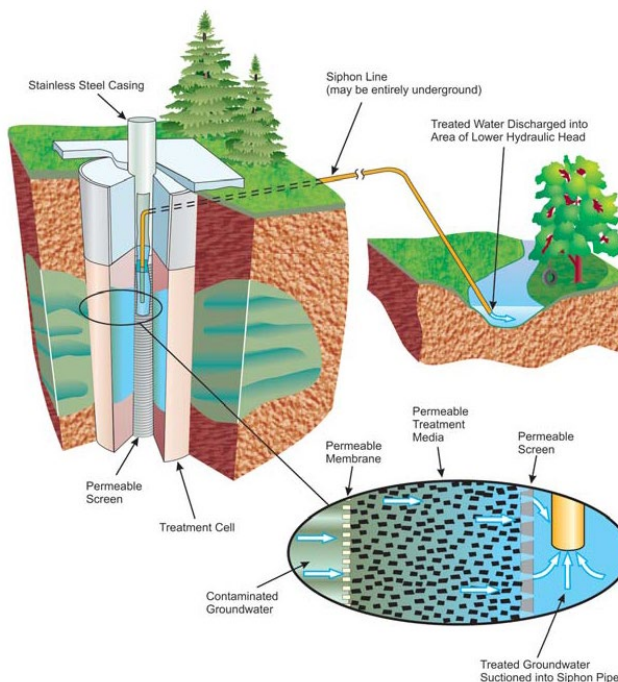
The GeoSiphon™ cell for the remediation of contaminated groundwater is an innovative and unique alternative to current technologies (pump and treat, funnel and gate, continuous permeable wall). The GeoSiphon™ cell minimizes the operating and maintenance cost associated with pump and treat systems, and at the same time minimizes the time required for remediation associated with funnel and gate or continuous permeable wall treatment systems.

Partnering opportunities

The U.S. Patent and Trademark Office has issued Patent No. 6,808,148 on this invention. Canada has also issued Patent No. 2,526,020.

SRNL invites interested companies with proven capabilities in this area of expertise to enter into a licensing agreement with SRNL to market this nuclear material detection system. Interested companies will be requested to submit a business plan setting forth company qualifications, strategies, activities, and milestones for commercializing this invention.

Qualifications should include past experience at bringing similar products to market, reasonable schedule for product launch, sufficient manufacturing capacity, established distribution networks, and evidence of sufficient financial resources for product development and launch.



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