



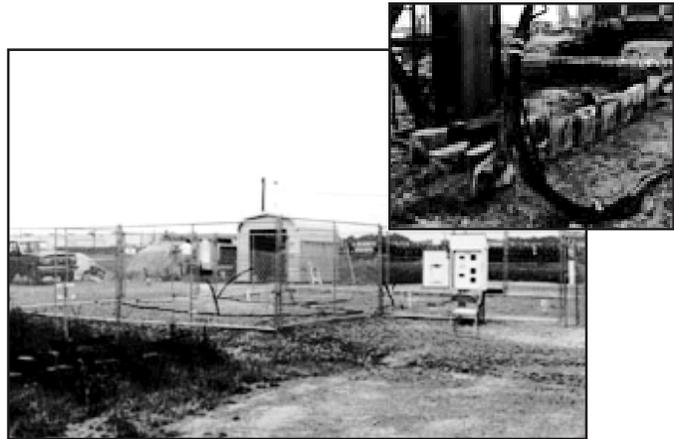
## LASAGNA

### The Problem

After years of designing, manufacturing, and testing nuclear weapons, the Department of Energy (DOE) is faced with the challenge of cleaning up the hazardous waste left behind. Surface and groundwater are threatened. More than 5,700 known groundwater plumes have contaminated more than 600 billion gallons of groundwater and 200 million cubic meters of soil with DNAPLs, hazardous metals, and radionuclides.

### The Technology

Lasagna remediates soils and soil pore water contaminated with soluble organic compounds. Lasagna is especially suited to sites with low permeability soils where electroosmosis can move water faster and more uniformly than hydraulic methods, with very low power consumption. The process uses electrokinetics to move contaminants in soil pore water into treatment zones where the contaminants can be captured or decomposed in a vertical configuration in a small field test cell. Lasagna remediates soils and soil pore water contaminated with soluble organic compounds. Lasagna is especially suited to sites with low permeability soils where electroosmosis can move water faster and more uniformly than hydraulic methods, with very low power consumption.



Paducah Gaseous Diffusion Plant

### The Deployment

After years of designing, manufacturing, and testing nuclear weapons, the DOE is faced with the challenge of cleaning up the hazardous waste left behind.

- Surface and groundwater are threatened. More than 5,700 known groundwater plumes have contaminated more than 600 billion gallons of groundwater and 200 million cubic meters of soil with DNAPLs, hazardous metals, and radionuclides
- DOE landfills contain more than three million cubic meters of waste buried with ineffective insulation, contaminating the surrounding environment.
- Soil, groundwater, and landfills throughout the country containing hazardous and radioactive contaminants have special cleanup needs.
- Current baseline technologies are inadequate or unacceptable because of excessive costs, long remediation schedules, and generation of secondary wastes.
- Public and environment at risk.

PBS # and Name
Paducah Waste Management

Deployment Date
August 4, 2000

Tech ID
4

Baseline Technology



Include schedule acceleration, programmatic risk reduction, worker/environment risk reduction, enabling technology, and impact on long-term stewardship.

**Lessons Learned**

Either used in deployment and/or identified as a result of deployment.

**The Benefits**

Costs for the Lasagna process vary from \$100-175/yd of soil treated, while other vendors suggest cost of \$50-100/yd. Costs for the Lasagna process vary from \$100-175/yd of soil treated, while other vendors suggest cost of \$50-100/yd.

***Benefits and Features***

- Cost savings of \$1.1M over 3-year period
- Removes TCE and Tc99 simultaneously
- Requires less disturbance of substrate
- Works up to 10 times faster
- Reduced analytical costs by 75%

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*Technology Name: Lasagna*

**End User Info.** Fraser Johnstone  
 Paducah Diff. Plant  
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*Technology Name: Spaghetti*

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Site Need #	Focus Area	Waste Type Category
ORHY-11a	Subsurface Contaminants	Hazardous Waste

