



U.S. DEPARTMENT OF
ENERGY

Legacy
Management



Fernald
Preserve

Community Meeting

September 16, 2014

2075

The U. S. Department of Energy (DOE) Office of Legacy Management's (LM) 11th annual community meeting on the Fernald Preserve was held on Tuesday, September 16, 2014, at the Fernald Preserve Visitors Center. The 11 people who attended the meeting received an update on site activities.



Agenda

- **Health and safety**
- **Natural Resource Trusteeship**
- **Site operations**
- **Nature nook**
- **Site activities**
- **Look ahead**



Fernald Preserve

Legacy Management Mission



Manage the U.S. Department of Energy (DOE) post-closure responsibilities and ensure the protection of human health and the environment.



Worker Health and Safety

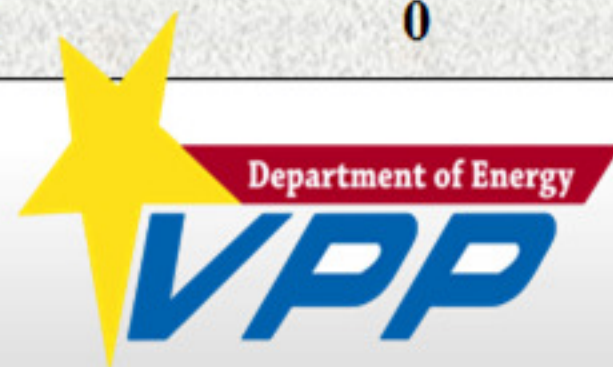
Occupational Safety and Health Administration (OSHA)

OSHA Recordable Cases (annually)

DOE Complex	LM	Industry
0.9	0.9	3.1

Fernald Preserve (quarterly)

Lost Time	First Aid	Recordable
0	1	0



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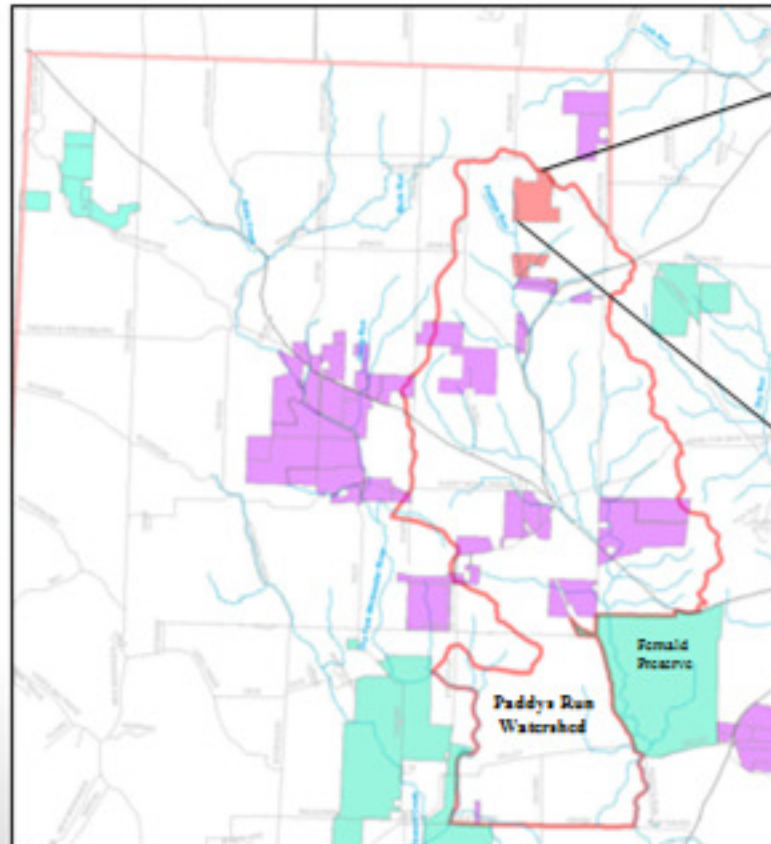
Safety records at the Fernald Preserve and in the nationwide Office of Legacy Management program continue to surpass industry standards.



Natural Resource Trusteeship

Activities

Paddys Run Conservation Focus Area



Salamander Run Conservation Area



Natural Resource Trusteeship activities continue in the Paddys Run watershed.



Fernald Preserve

Project Leads

- **Karen Voisard, The S.M. Stoller Corporation**
 - Environmental Monitoring, Data Management and Reporting
- **John Homer, The S.M. Stoller Corporation**
 - Ecological Restoration
- **Ken Broberg, The S.M. Stoller Corporation**
 - Aquifer Restoration
- **Penny Borgman, The S.M. Stoller Corporation**
 - Public Affairs
- **Bill Hertel, The S.M. Stoller Corporation**
 - Site Manager

The S.M. Stoller Corporation is a wholly owned subsidiary of Huntington Ingalls Industries, and contractor to the U.S. Department of Energy Office of Legacy Management.

The S.M. Stoller Corporation subject matter experts.



Legacy Management and Institutional Controls Plan Site Environmental Report

- **LMICP describes the requirements for the site's long-term care**
- **LMICP is reviewed, revised, and submitted annually to the regulatory agencies**
- **LMICP consists of two volumes:**
 - **Volume I: Provides details for site management**
 - **Volume II: Required under the CERCLA remediation process and is a legally enforceable document**
- **SER contains annual monitoring requirement results**
- **LMICP and SER are available and searchable online at www.lm.doe.gov**

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The Comprehensive Legacy Management and Institutional Controls Plan documents the requirements for the Fernald Preserve's long-term care. It is reviewed and updated yearly, and the latest version is available on the Office of Legacy Management website: www.lm.doe.gov.



Sampling

2013

- **Surface water sampling at 21 locations**
- **Treated effluent sampling at one location**
- **Direct radiation monitoring at 11 locations**
- **On-Site Disposal Facility leak detection monitoring at 42 locations**
- **Groundwater sampling at 140 monitoring wells**
- **Continuing approved semiannual, quarterly, and daily sampling**

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Routine environmental monitoring is conducted to ensure continued effectiveness of the site's cleanup. The current monitoring regimen includes sampling groundwater, surface water, treated effluent, and direct radiation.



Monitoring

Dosimeter Locations



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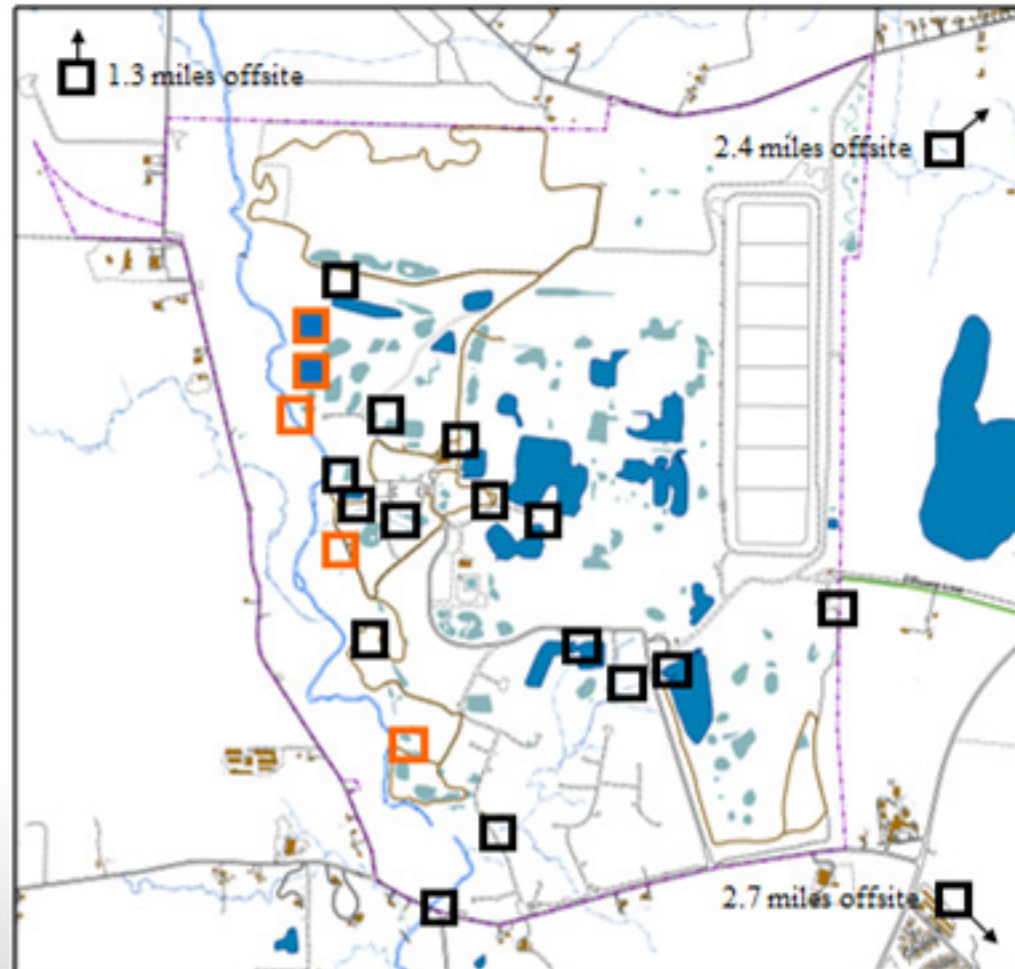
Direct radiation monitoring locations.



Fernald
Preserve

Monitoring

Surface Water and Treated Effluent Locations



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Surface water continues to be monitored at numerous locations onsite and offsite.



Restoration

Ecological

- **Restoration projects**
- **Restored area maintenance**
- **Ecological monitoring**
- **Site and On-Site Disposal Facility inspections**



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Ecological restoration work includes maintenance, monitoring, and inspections.



Monitoring

Ecological

- **Functional monitoring**
- **Implementation monitoring**
- **Site and On-Site Disposal Facility inspections**



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Monitoring programs help to evaluate the status of ecologically restored areas at the Fernald Preserve.



Inspections

2013

- Site
- On-Site Disposal Facility
- Trail



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The inspection process continues in compliance with the Fernald Preserve *Comprehensive Legacy Management and Institutional Controls Plan*.



Streambank Stabilization

Paddys Run



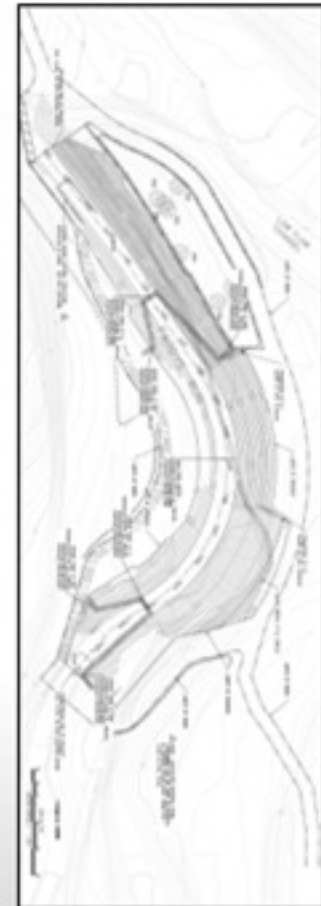
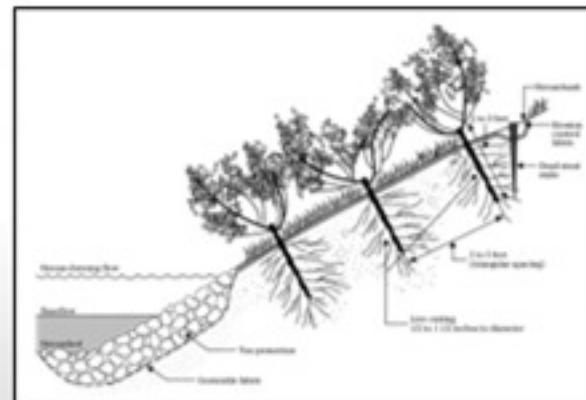
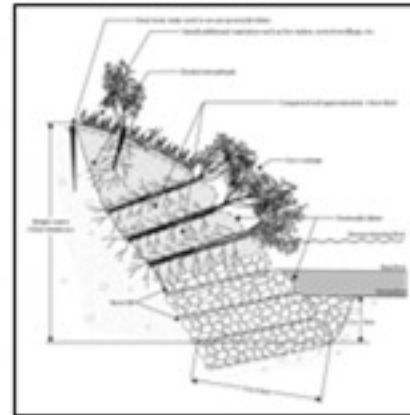
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The Paddys Run Streambank Stabilization Project construction began in September 2014.



Streambank Stabilization

Paddys Run

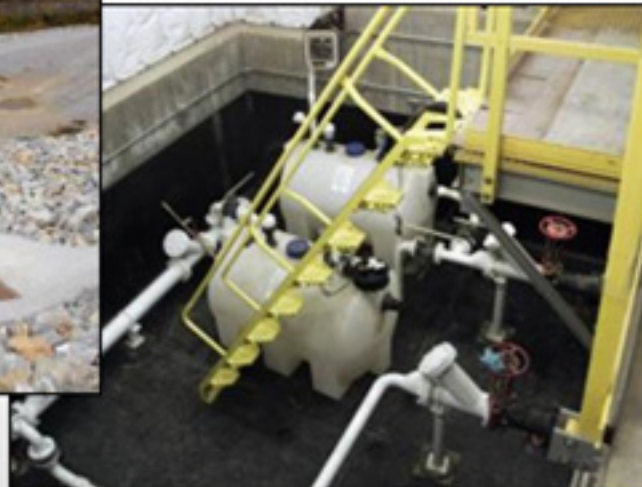


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The Paddys Run Streambank Stabilization Project construction began in September 2014.



On-Site Disposal Facility



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The On-Site Disposal Facility is an engineered waste-storage area that holds 2.95 million cubic yards of waste.



On-Site Disposal Facility

Cover



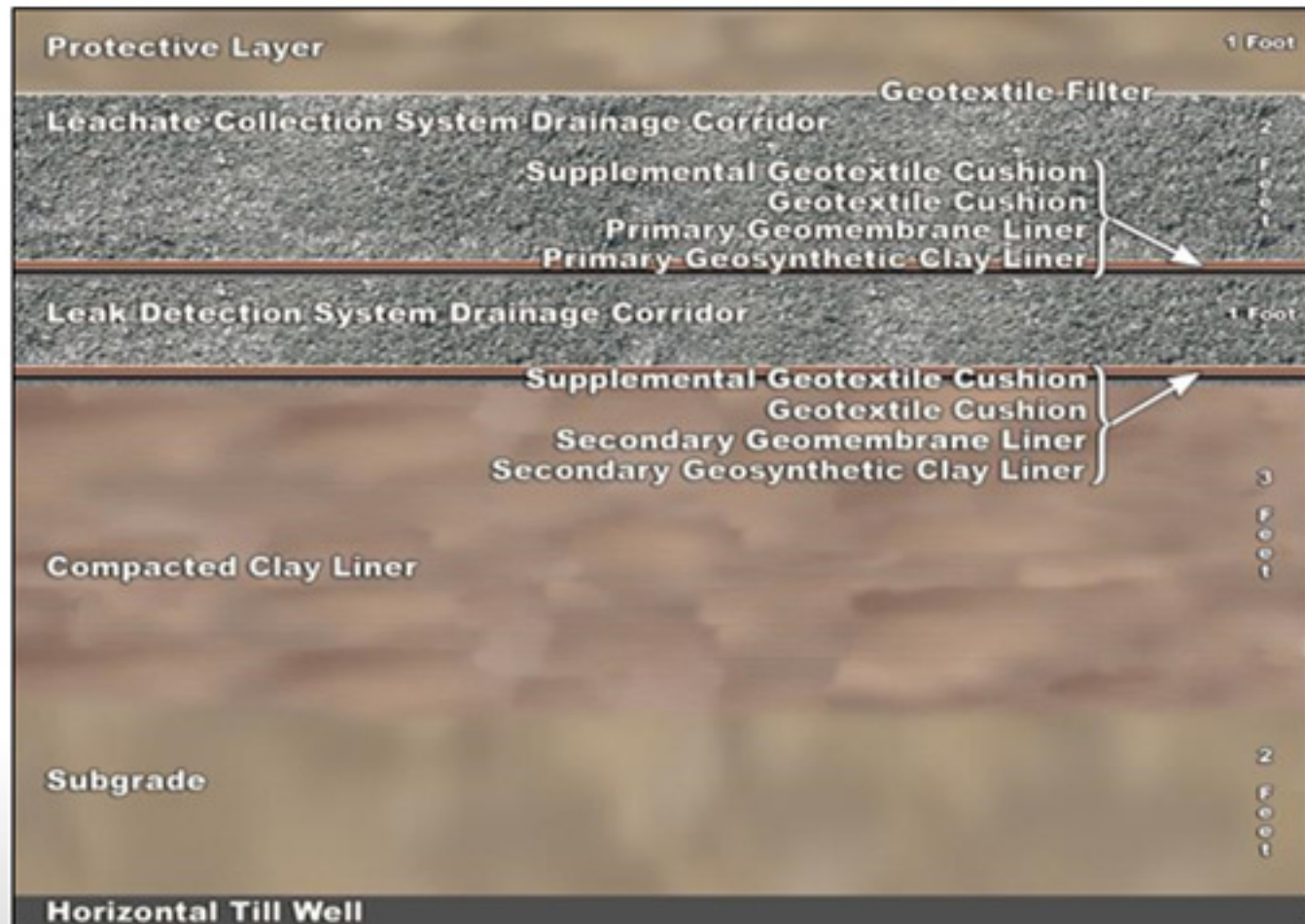
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The On-Site Disposal Facility's engineered cover system.



On-Site Disposal Facility

Liner



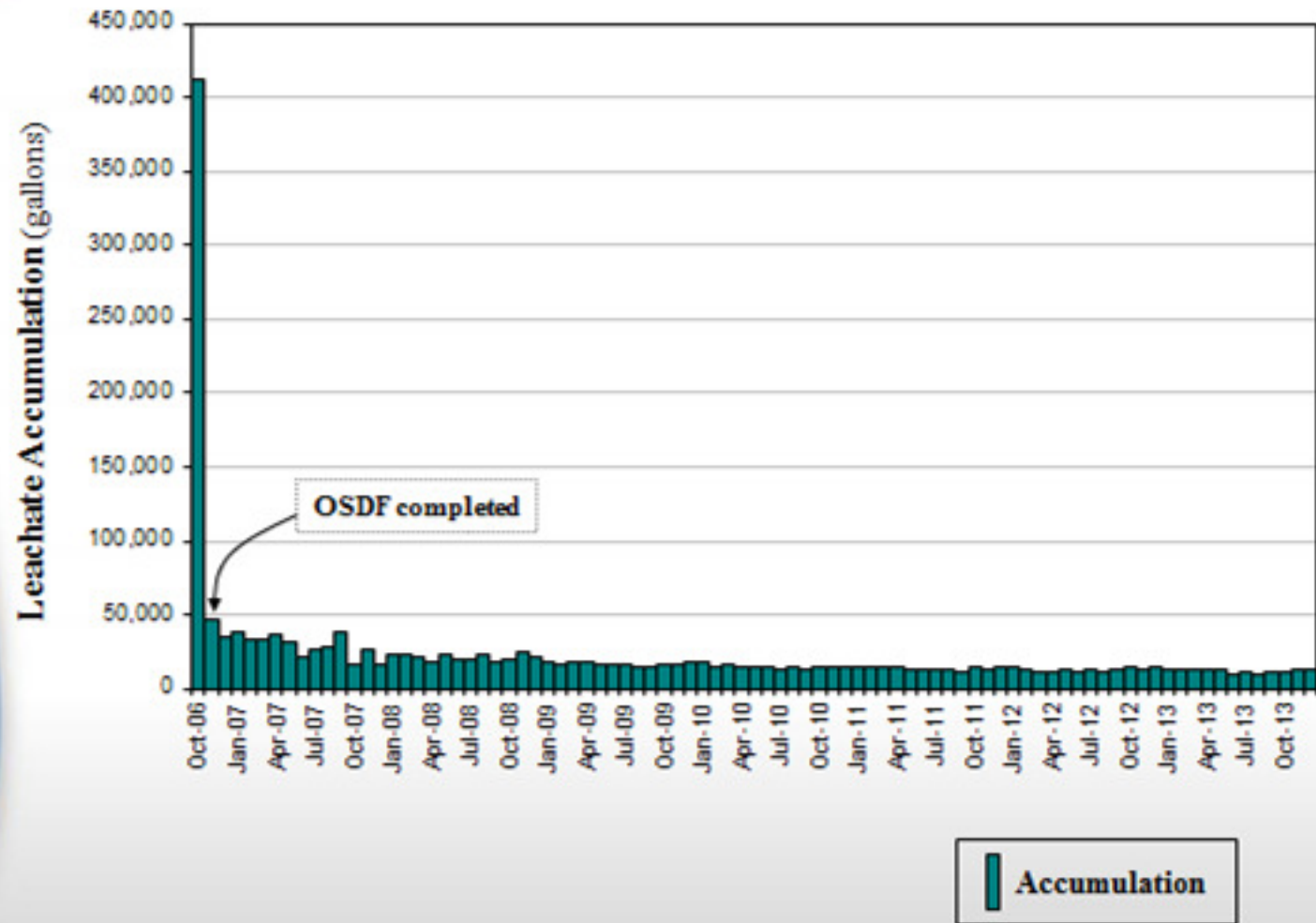
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The On-Site Disposal Facility's engineered liner system.



On-Site Disposal Facility

Leachate Collection System



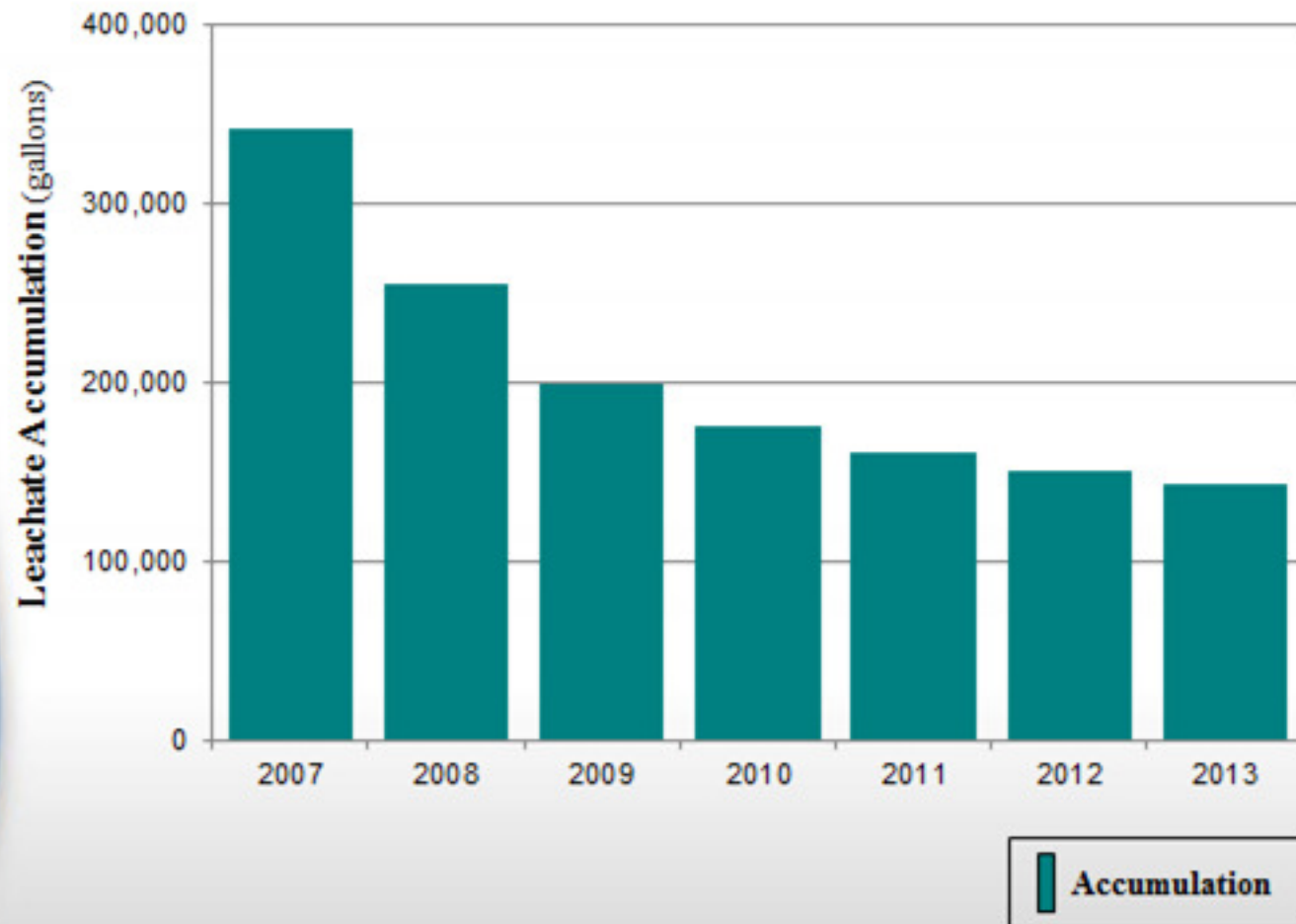
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Leachate is the moisture in the waste within the On-Site Disposal Facility. The leachate is collected and transferred to a treatment facility. Before the cover system was completed in October 2006, hundreds of thousands of gallons of leachate flowed each month. By 2013, leachate flows decreased to a monthly average of 11,978 gallons.



On-Site Disposal Facility

Leachate Collection System



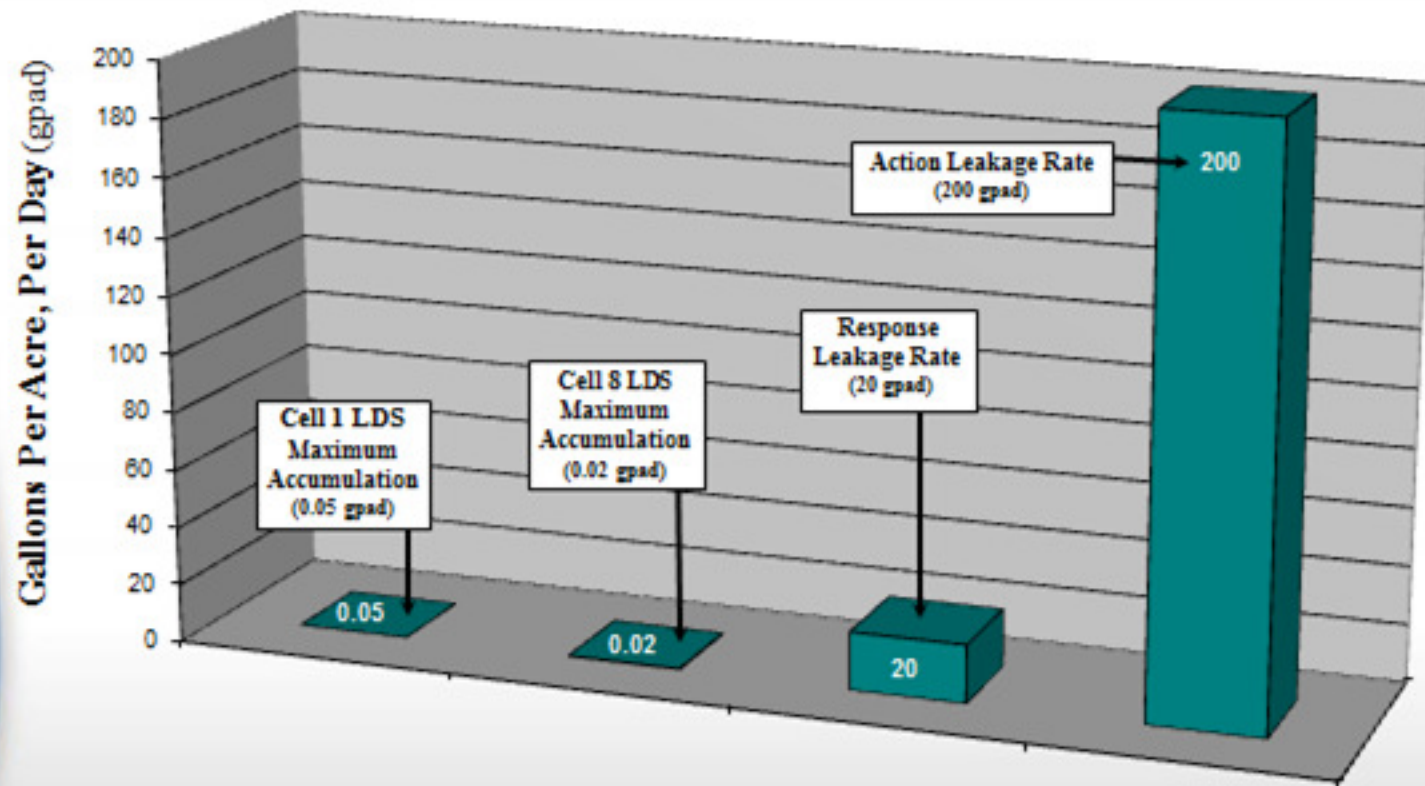
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Leachate is the moisture in the waste within the On-Site Disposal Facility. The leachate is collected and transferred to a treatment facility. Annual leachate flow continues to decline.



On-Site Disposal Facility

Cells 1 and 8 in 2013: Leak Detection System Accumulation, Response, and Action Leakage Rates



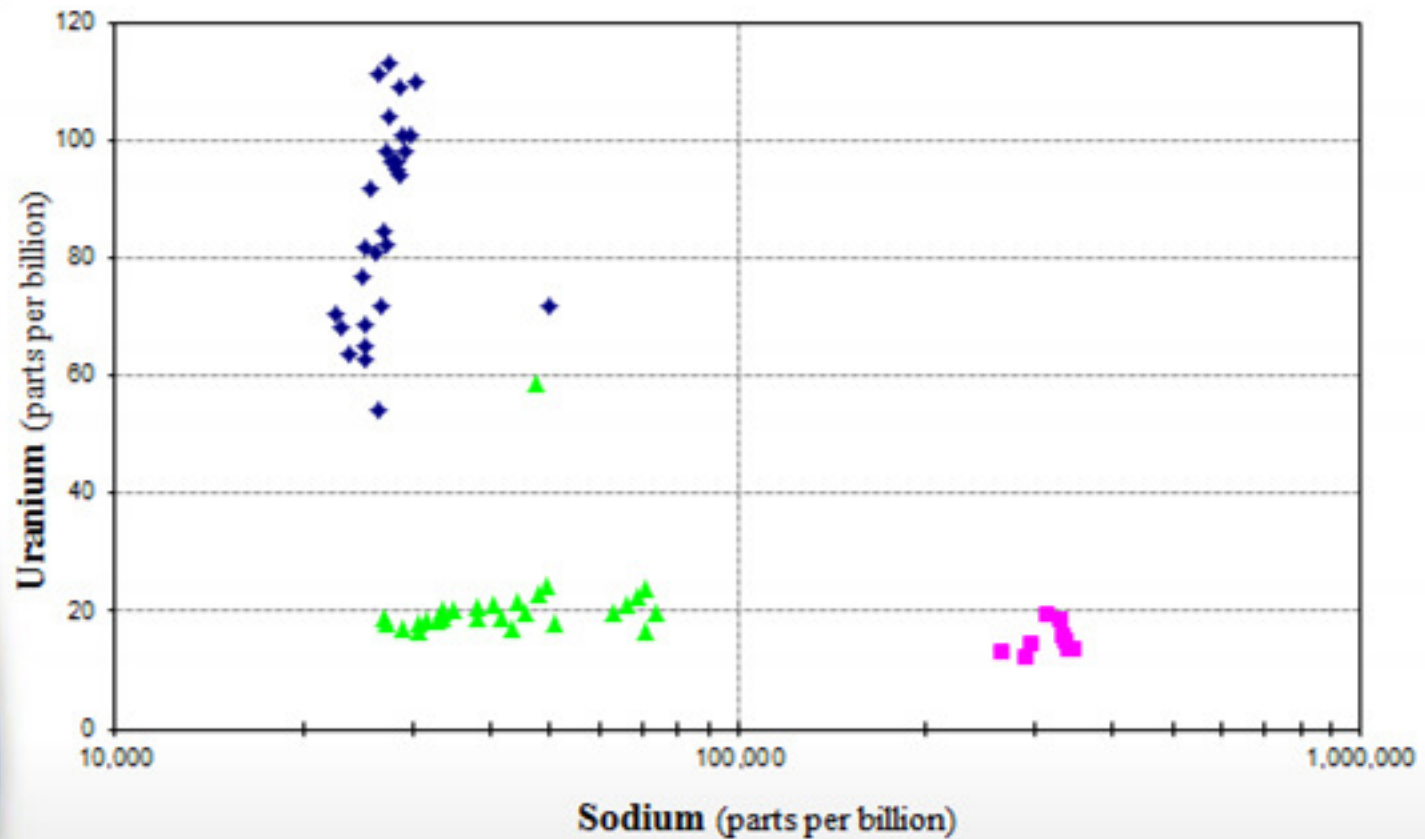
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Leak Detection System accumulation rates in Cells 1 and 8 were very small compared to the Response Leakage Rate, which is 20 gallons per acre, per day, while the Action Leakage Rate is 200 gallons per day.



On-Site Disposal Facility

Uranium vs. Sodium Concentrations: Cell 3 (bivariate plot)



◆ Leachate Collection System ■ Leak Detection System ▲ Horizontal Till Well

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A comparison of uranium concentrations and sodium concentrations in and below Cell 3 of the On-Site Disposal Facility is an example of a method used to demonstrate that the liner system is working as designed.



On-Site Disposal Facility

Performance: 2013

- **No indication of leaks**
- **Highest Leak Detection System maximum accumulation**
 - Cell 6: 0.07 gallon per acre, per day (gpad)
 - Initial response leakage rate: 20 gpad
 - Action leakage rate: 200 gpad
- **Leachate Collection System volumes have stabilized and continue to diminish indicating the cell cap is functioning as designed**
- **Leak Detection System accumulation rates indicate the liner systems are performing within cell design**
- **Water quality trends in the horizontal till wells and Great Miami Aquifer wells indicate concentration fluctuations beneath the facility**
- **No visual signs of compromised cap integrity**

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The On-Site Disposal Facility cap and liner systems are performing as designed.



Aquifer Restoration



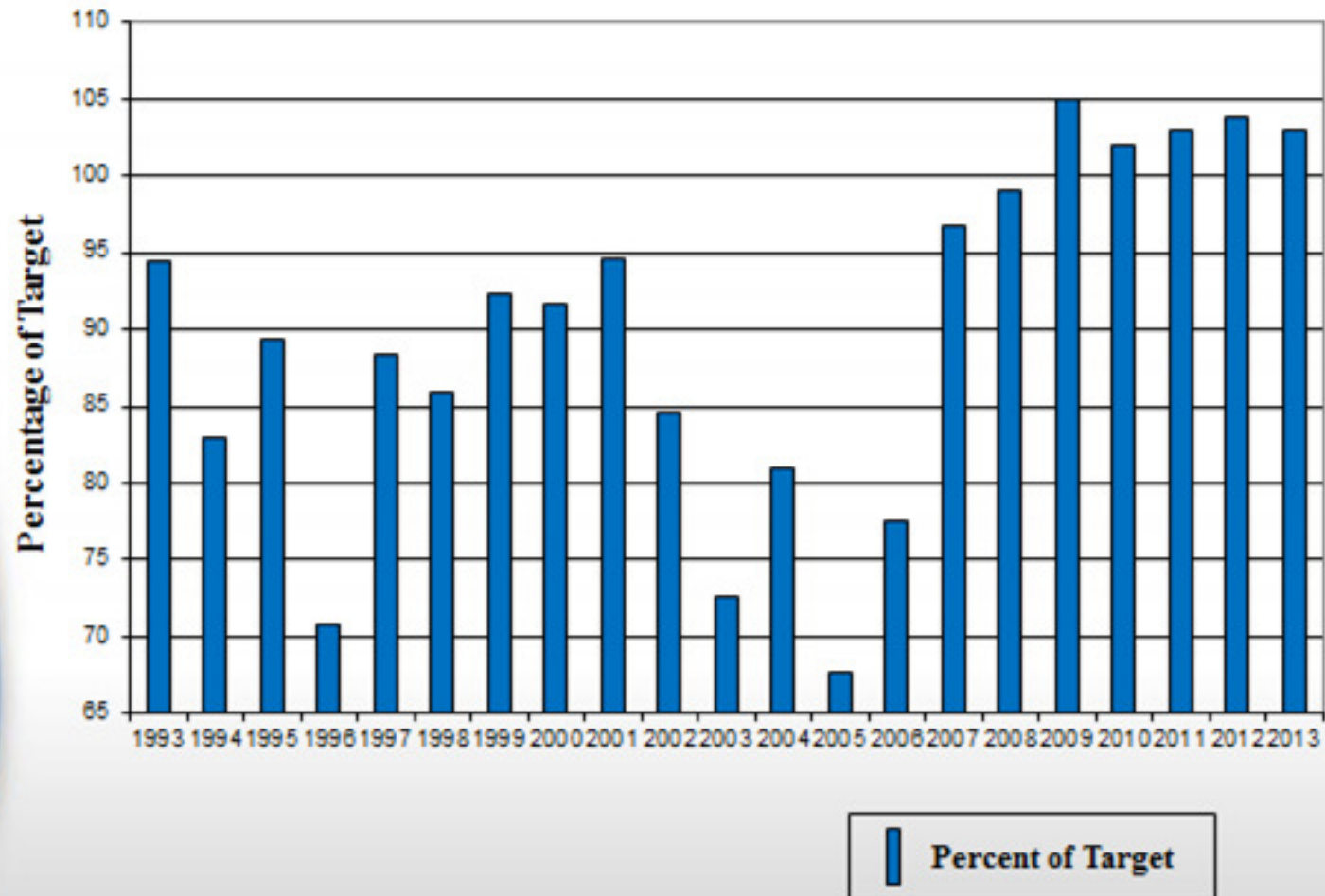
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Groundwater cleanup continues at the Fernald Preserve.



Aquifer Restoration

Pumping: Percentage of Target Achieved



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Since site closure in 2006, operations have annually achieved at least 97 percent of planned operation targets.



Aquifer Restoration

Maximum Plume: 2006 and 2013



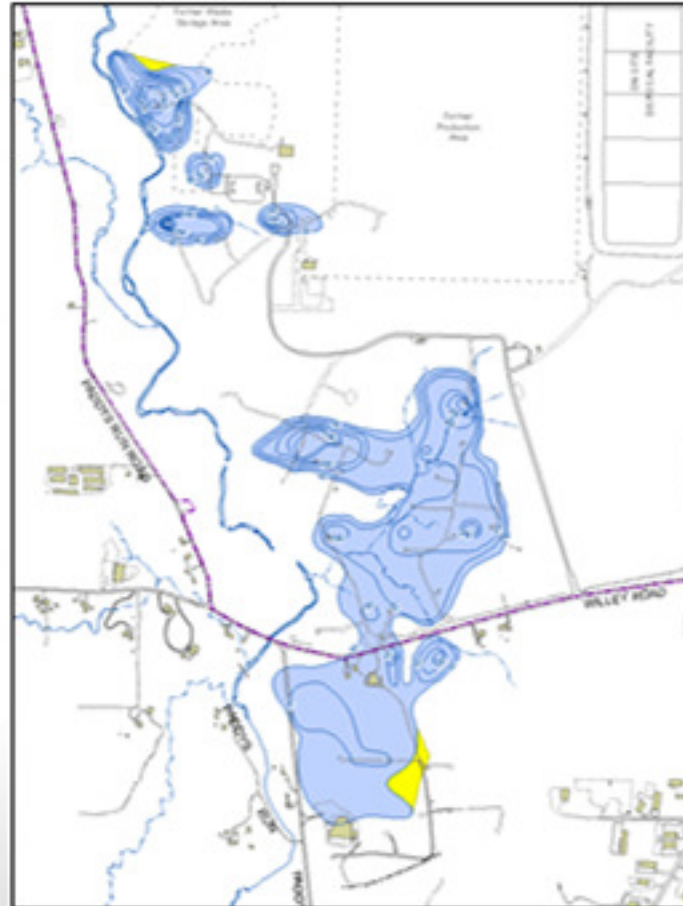
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Maximum size of uranium plume footprint was 127.3 acres in 2013.



Aquifer Restoration

Maximum Plume: 2012 and 2013



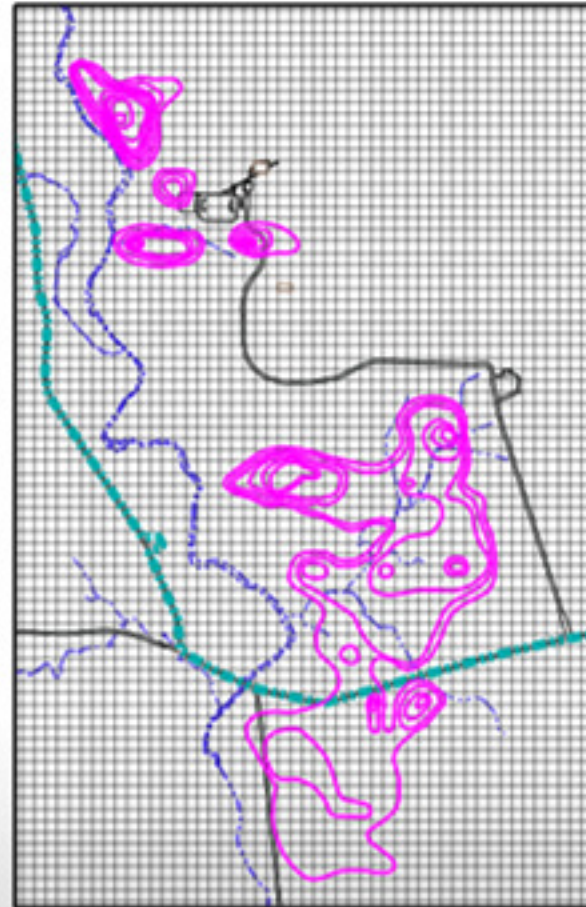
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The maximum uranium plume footprint did not decrease significantly from 2012 to 2013. However, the uranium concentration within the plume footprint did decrease, based on data collected in 2013.



Aquifer Restoration

Groundwater Modeling



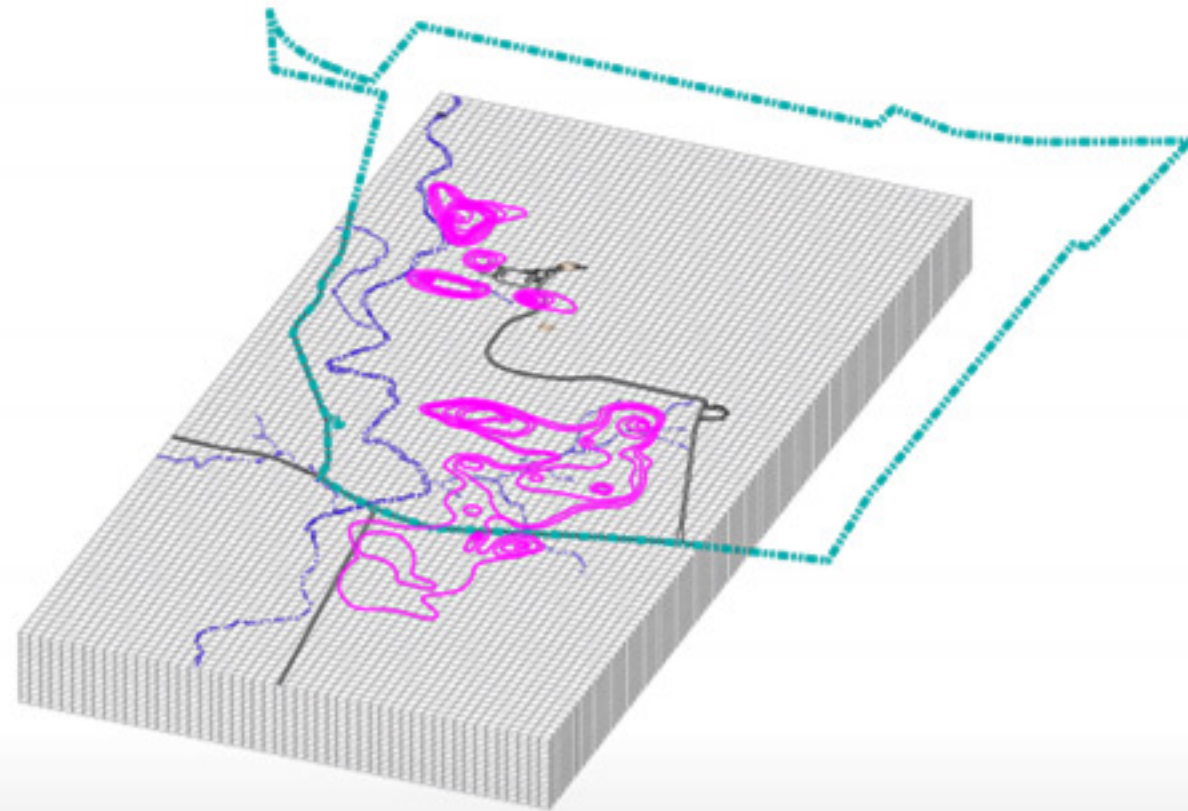
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New groundwater modeling predictions indicate that the aquifer cleanup will be extended beyond earlier modeling predictions.



Aquifer Restoration

Groundwater Modeling



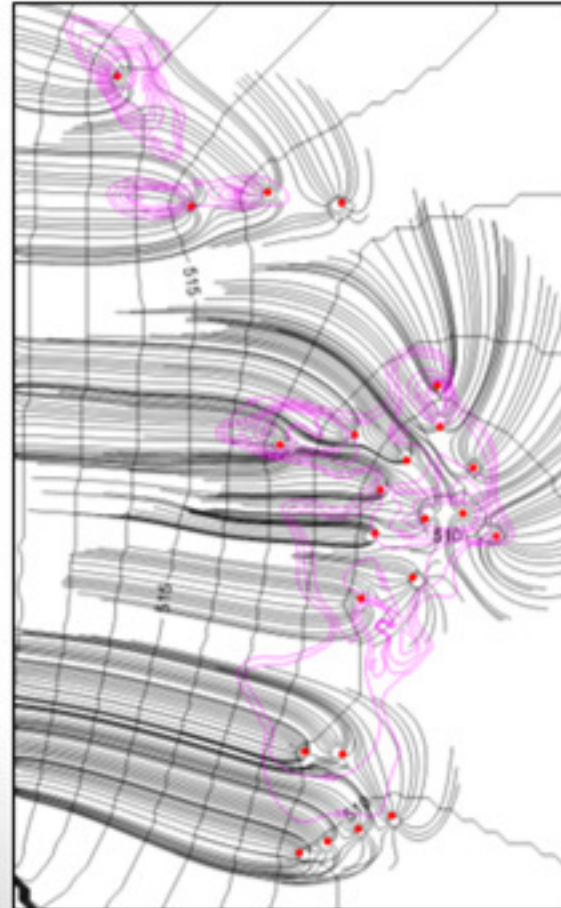
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In this block model diagram, each point in the aquifer fits into a unique cell of the groundwater model.



Aquifer Restoration

Groundwater Modeling



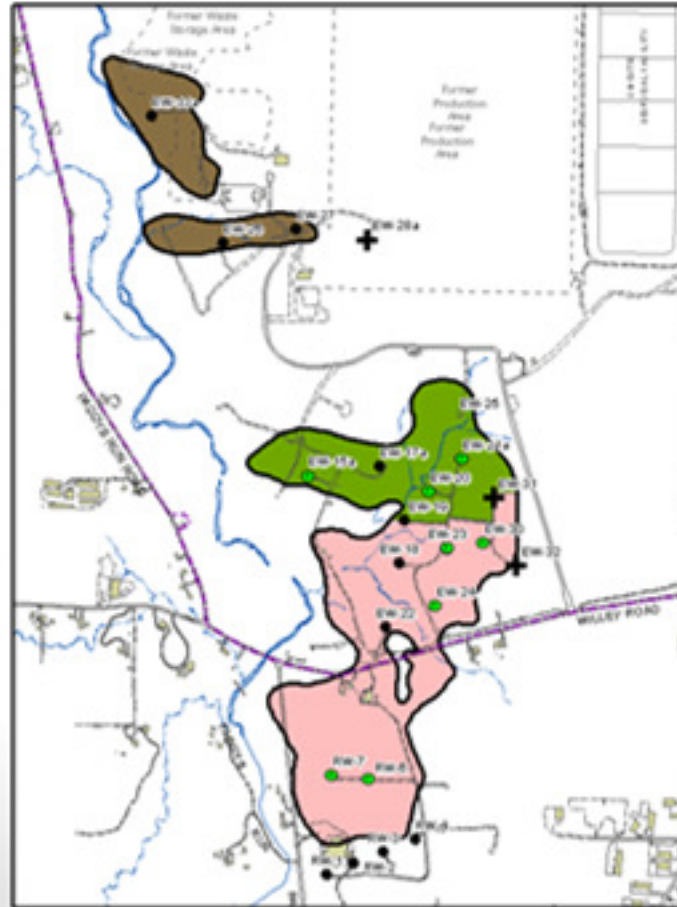
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Particle tracks are used to illustrate how water is predicted to move toward a pumping well.



Aquifer Restoration

Groundwater Modeling



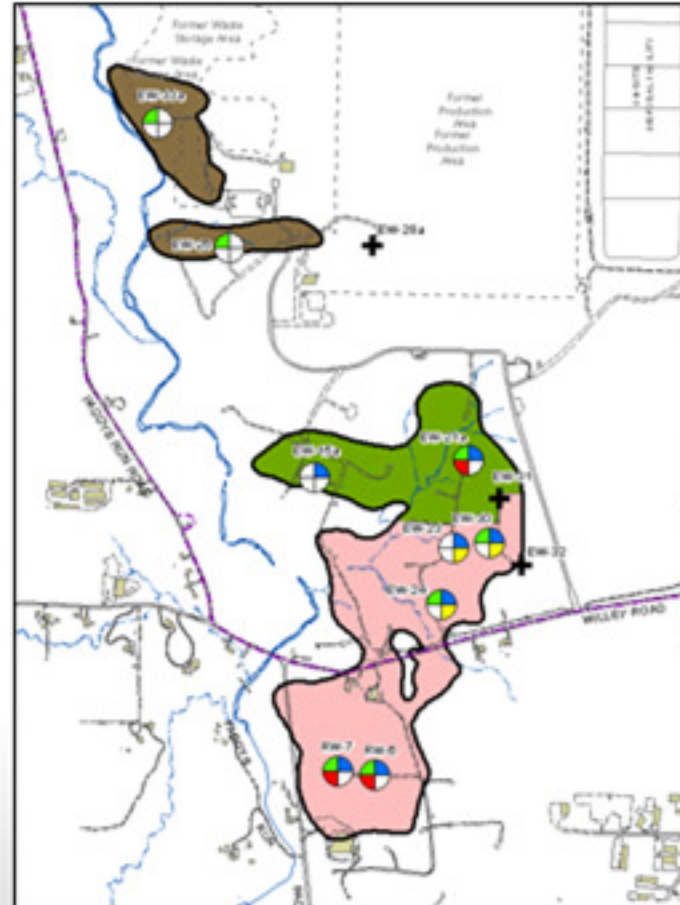
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More uranium is being removed from the aquifer as a result of operational adjustments implemented in 2014.



Aquifer Restoration

Operational Adjustments: 2014



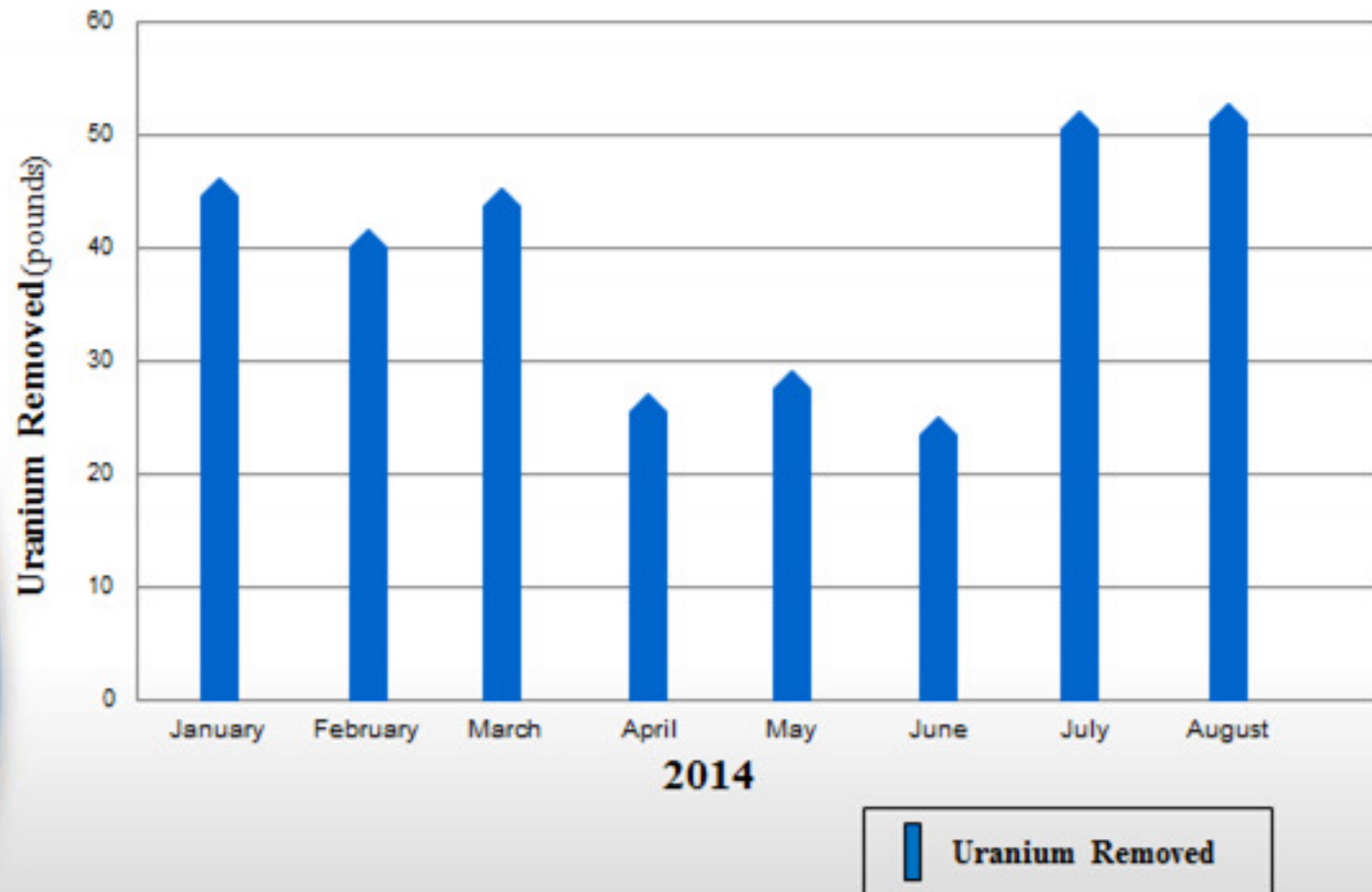
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Groundwater operational changes were implemented in 2014.



Aquifer Restoration

Operational Adjustments: Current Status



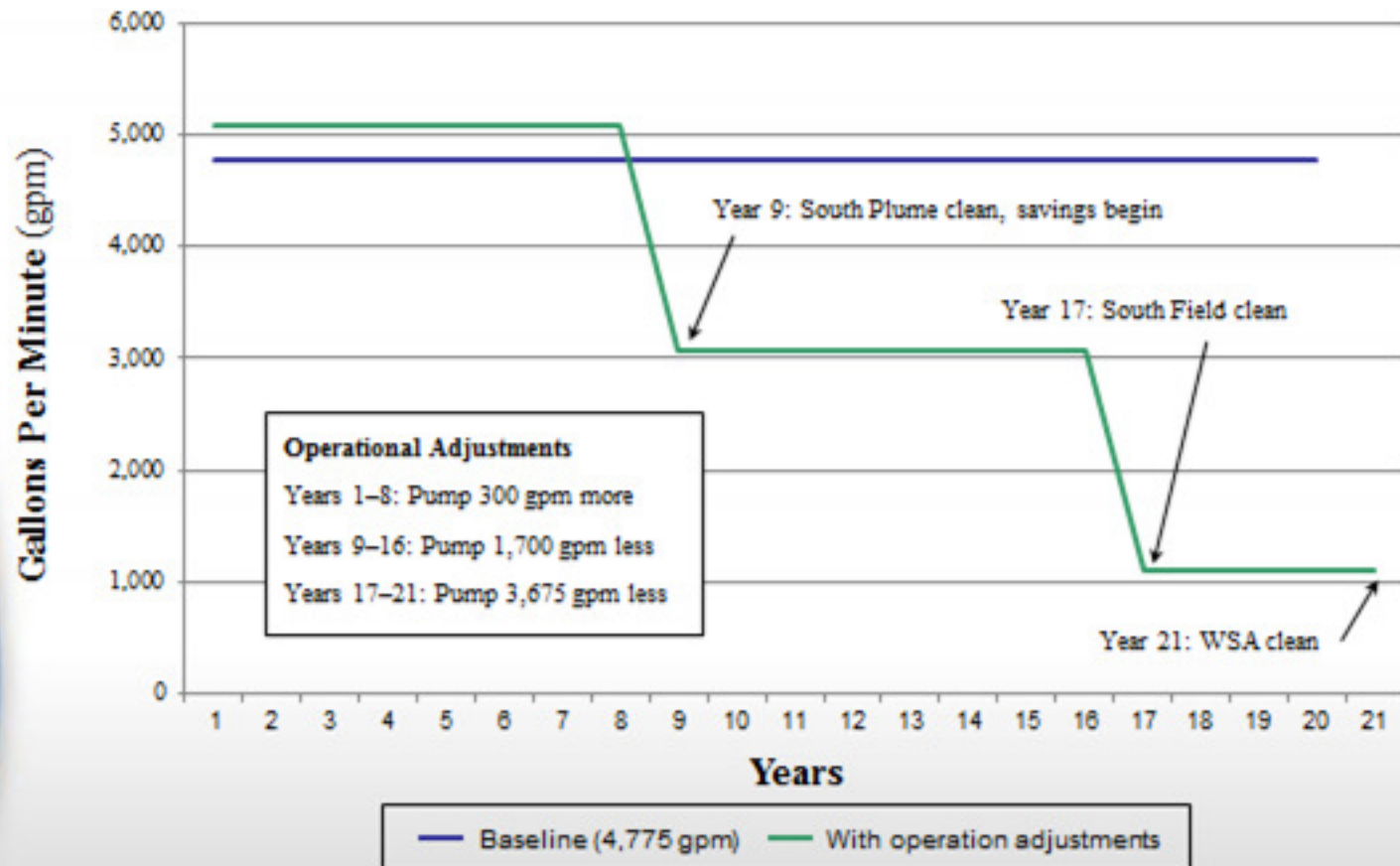
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More uranium is being removed from the aquifer as a result of operational adjustments implemented in 2014.



Aquifer Restoration

Operational Adjustments: Pumping Plans



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The model predicts that pumping at slightly higher rates now will allow pumping rates to be reduced in the future.



Aquifer Restoration

Operational Adjustments: Predicted Costs



Total Predicted Savings: \$6,088,000

The model predicts that amplified pumping will reduce future costs.



Nature Nook



Northern Saw-whet Owl
(Aegolius acadicus)

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A regular feature of the community meeting is the Nature Nook, which highlights flora and fauna at the Fernald Preserve.



Fernald Preserve

- **Site use**
- **Events**



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During 2013, a wide variety of groups—including students, birders, Scouts, and seniors—visited and used the Fernald Preserve and its facilities. Since the site opened to the public in 2008, schools, conservation organizations, former workers, hikers, cyclists, and many others have used the site, the Visitors Center, and the Community Meeting Room.



Fernald Preserve

Passenger Pigeon Weekend



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Fernald Preserve staff and visitors recently participated in a nationwide event that recognized wildlife conservation progress made in the last 100 years.



Site Activities

Projects: 2014

- **Program Shelter**
- **Stabilize Paddys Run streambank**
- **Construct boardwalk**
- **Upgrade site electrical infrastructure**



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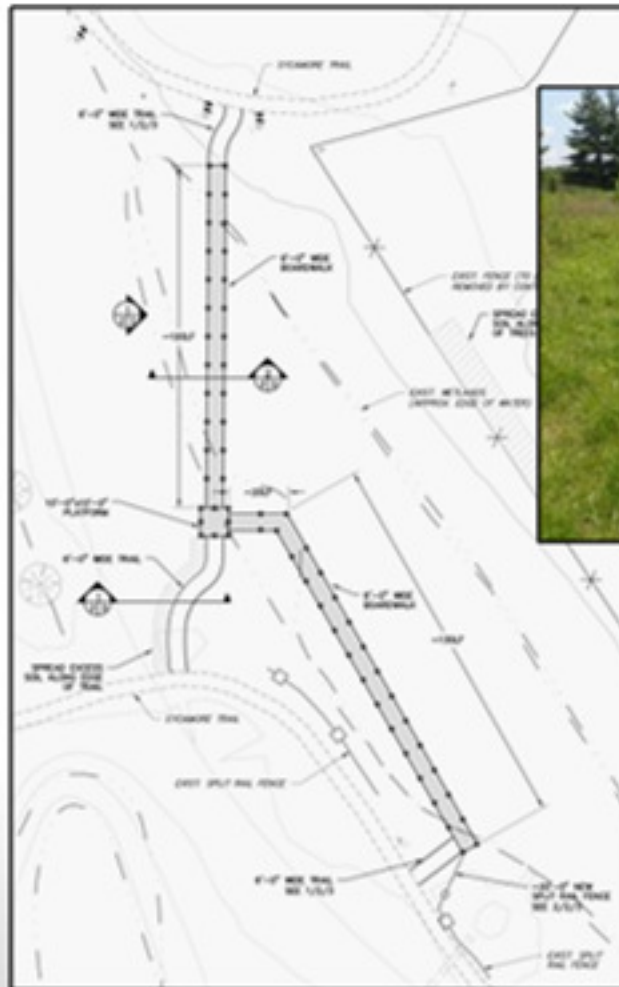
The completion of the Program Shelter earlier in the year will allow for three additional construction projects to be worked on during the fall and winter seasons.



Fernald
Preserve

Site Activities

Sycamore Trail Boardwalk



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A boardwalk is being constructed over a wetland located on the Sycamore Trail to enhance public outreach programs.



Site Activities

Site Electrical Upgrades



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The electrical and communication lines will be installed underground from the On-Site Disposal Facility to the wastewater treatment facility.



Look Ahead

- **Continue aquifer restoration**
- **Continue sampling**
- **Continue site and On-Site Disposal Facility monitoring and maintenance**
- **Continue unique educational programs**
- **Pave select gravel areas**
- **Construct boardwalk**
- **Upgrade site electrical infrastructure**
- **Natural Resource Trusteeship**
 - **Enhance northern woodlot**
 - **Restore Paddys Run west wetlands**

The look-ahead explains the work planned for the coming year.



Questions and Contacts

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The next annual Fernald Preserve community meeting will be in the fall of 2015.