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Western New York Nuclear Service Center – History and NYSERDA Perspective

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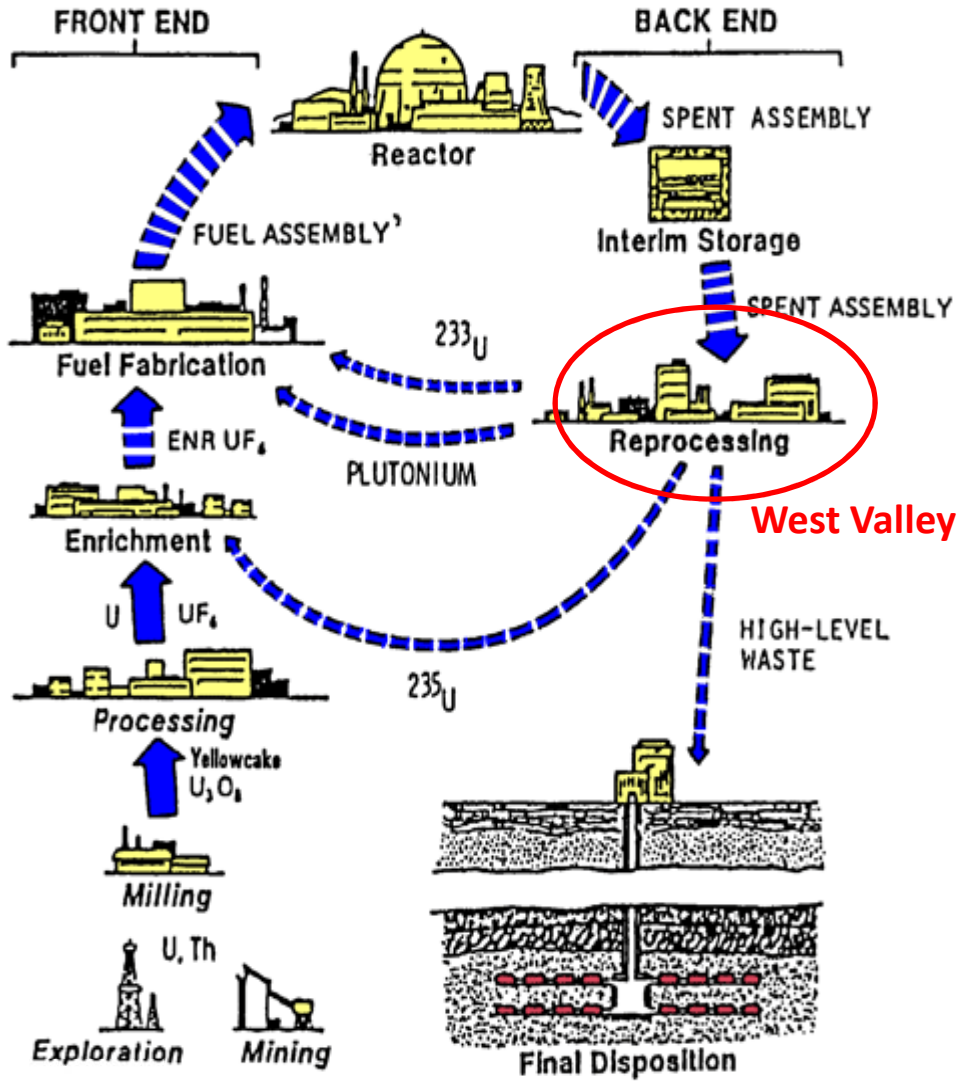
Session # 69

Development of a Civilian Reprocessing Capability

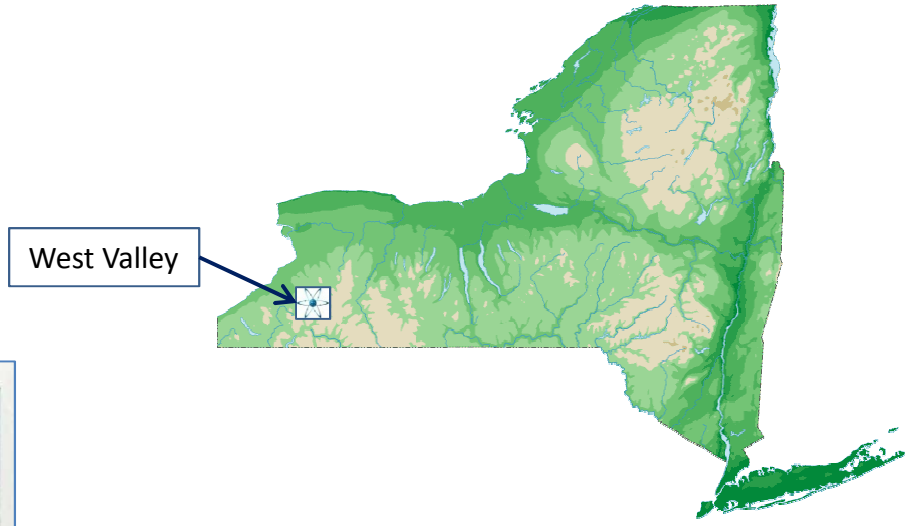


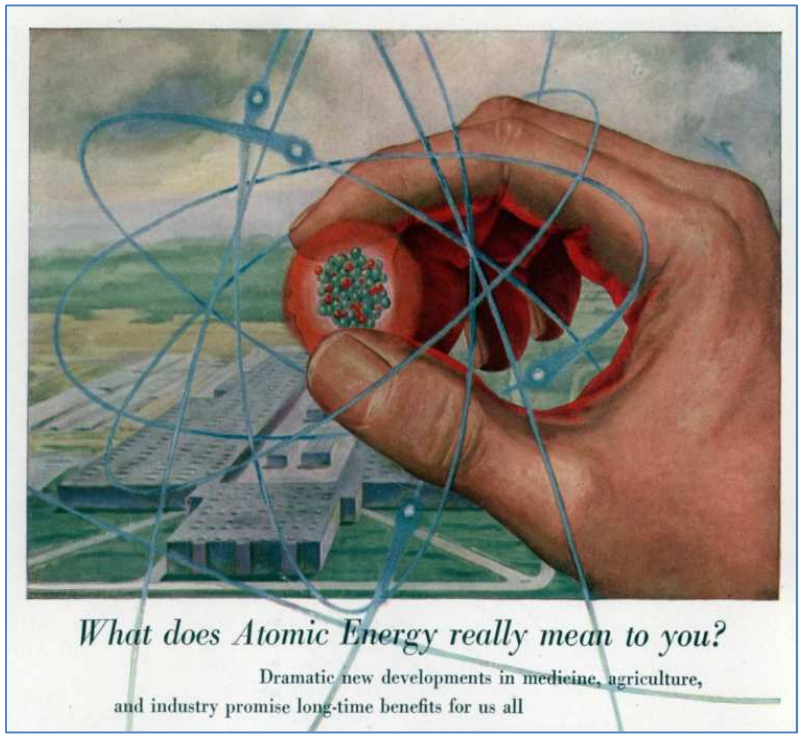
In 1957, AEC announced that it would:

- Make AEC technology on reprocessing available to private industry;
- Invite proposals by private industry to design, construct, and operate reprocessing plants; and
- Provide a baseload of fuel from federal government reactors.

Development of a Civilian Reprocessing Capability

New York State became interested in the AEC privatization program as a way to promote industrial development within the State.

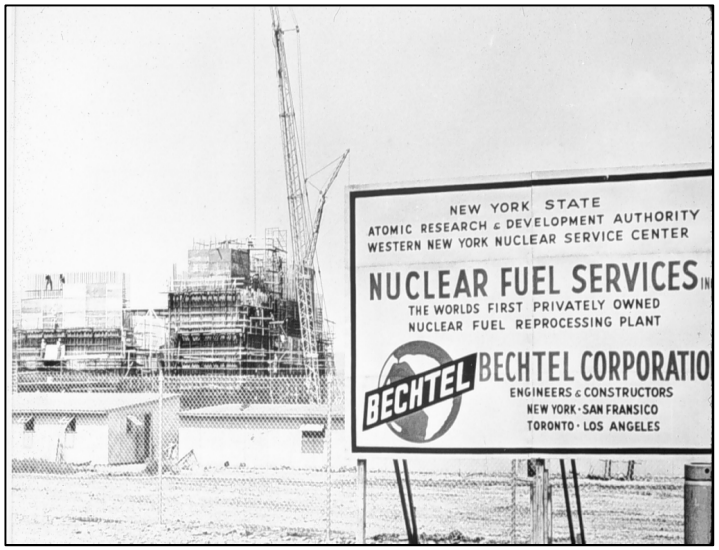




- New York established an Office of Atomic Development in 1956.
- 3,300 acres were acquired by NYS near the hamlet of West Valley in 1961 for a reprocessing facility.

NFS Reprocessing Operations Begin in 1966

- **NFS was licensed as the operator of the facility, and the New York State Atomic Research and Development Authority was licensed as the owner.**
- **The construction cost was about $33 million.**



- **AEC set the fee structure for reprocessing—NFS could not charge more than 15% above the AEC-published charges based on a conceptual AEC reprocessing plant.**
- **Construction was completed in 1966, and the AEC granted a provisional operating license for the facility.**

NFS Ends Reprocessing Operations in 1972

- NFS halted reprocessing in 1972 to make some process improvements.
- NFS expected the modifications to cost $15 million.
- AEC issued new requirements related to waste management, earthquake and tornado protection.

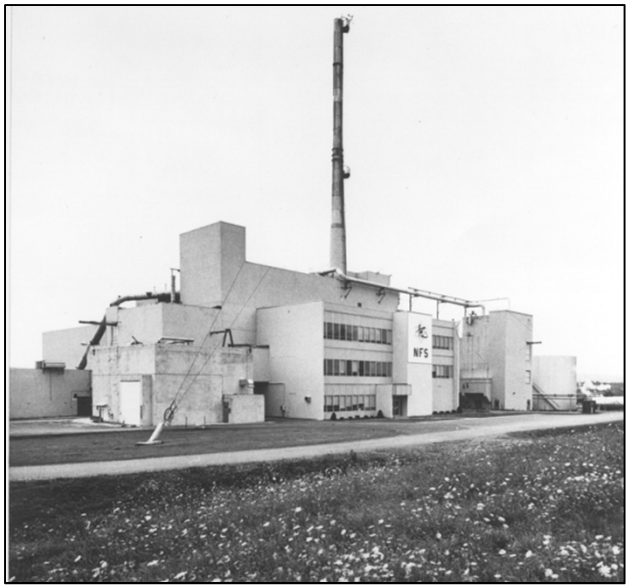
- NFS estimated that the retrofit would cost $600 million and would require a new licensing process.
- In 1976, NFS informed New York that it would not resume reprocessing.
- 600,000 gallons of liquid high-level waste (HLW); three million ft^3 of radioactive waste; and highly contaminated facilities were present at the site.
- New York State refused to accept the facility and wastes from NFS.

75 percent of the spent fuel came to West Valley under the AEC baseload contract. 60 percent is from the N-Reactor at Hanford.

West Valley Demonstration Project Act

- U.S. Congress held hearings, directed the GAO to investigate, and directed the Department of Energy (DOE) to study options for the future of the Center.
- Congress passed the West Valley Demonstration Project Act in 1980.

President Carter Signs the WVDP Act



- The West Valley facility owes its existence to federal policy and programs
- A combination of economic factors, technological difficulties and an evolving regulatory framework led to the failure of the facility.

NYSERDA Perspective on a few Important Issues

- Federal-State Responsibility
- North Plateau Groundwater Plume
- Phased Decisionmaking
- Phase 1 Studies
- Federal Appropriation for the WVDP
- State-Licensed Disposal Area (SDA)

Federal-State Responsibility

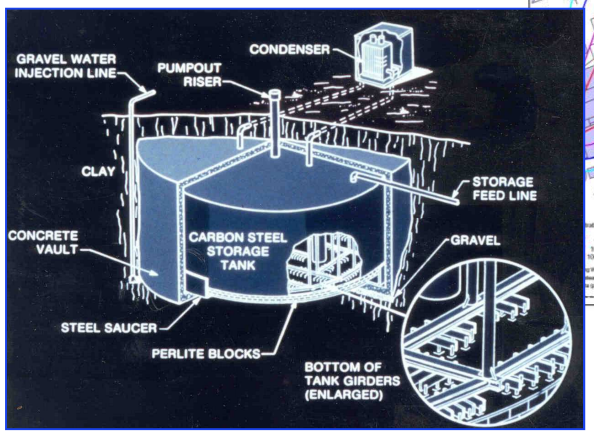
Differing interpretations of the WVDP Act led to disagreements in federal-state responsibility for:

Decommissioning certain areas of the site including:

- North Plateau Groundwater Plume
- NRC-Licensed Disposal Area
- Contaminated soils

Long-term stewardship of remaining facilities or contamination including:

- HLW Tanks
- North Plateau Groundwater Plume
- NRC-Licensed Disposal Area
- Soils



HLW Disposal Fee

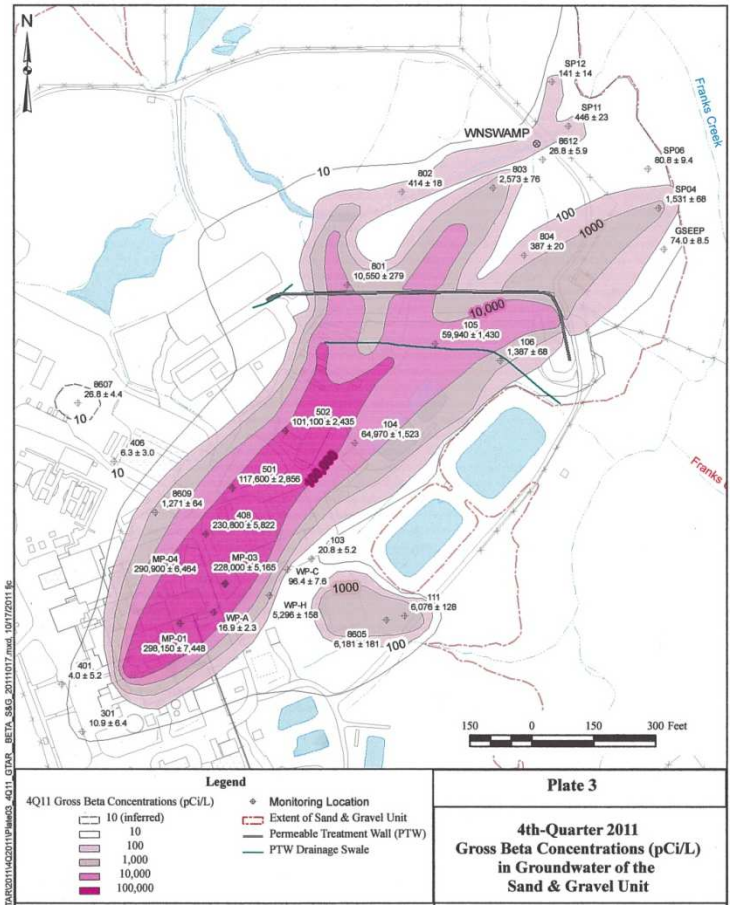
NYSERDA filed litigation in 2006 against the federal government.

2010 Consent Decree Resolved Most of the Responsibility Issues

A Settlement Agreement was approved by the U.S. District Court, Western District of New York, in 2010:

- The Consent Decree includes specific cost splits for response actions for each facility on site, contaminated soils, underground piping and contamination that may be found in the future, for example:
  - ✓ 90/10 for WVDP facilities
  - ✓ 50/50 for the North Plateau Groundwater Plume
  - ✓ 50/50 for the NRC-Licensed Disposal Area
  - ✓ 30/70 for the State-Licensed Disposal Area (SDA)
- Relates only to the allocation of financial responsibility, and does not affect or select cleanup alternatives for the site;
- Requires agencies to develop detailed plans to assure continued consultation between the agencies during the remainder of the cleanup;
- The agencies did not reach agreement on the HLW Disposal Fee.

North Plateau Groundwater Plume



"One-pass trencher"

- Permeable Treatment Wall installed in 2010 to mitigate the migration of Sr-90 contaminated groundwater appears to be functioning as designed.
- Source area of the plume will be removed as part of Phase 1 decommissioning.

Phased Decommissioning

Phase 1 Decommissioning:

- $1 billion in demolition and removal
- 10-20 years to complete, depending on funding
- Reprocessing facilities and the source of the groundwater plume are removed.
- Phase 1 studies will be conducted to provide information for the Phase 2 decisions.

- This is a major step forward in the West Valley Demonstration Project.
- Includes removal of significant facilities.
- Provides time for further evaluation of issues associated with a long-term Performance Assessment of the site.

Phase 1 Studies

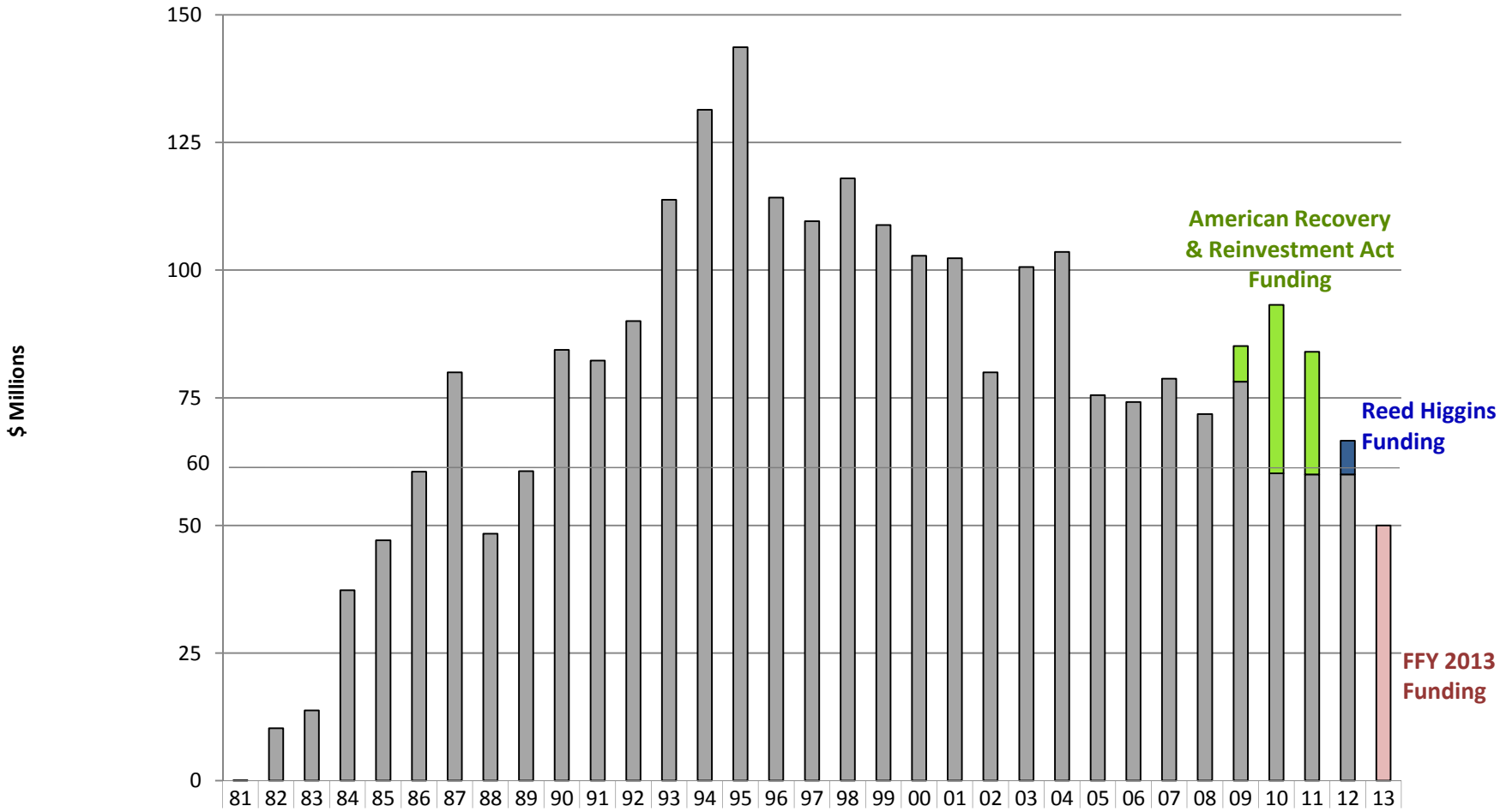
- NYSERDA had a number of issues with the technical approach used to calculate impacts for both the in-place closure and exhumation alternatives in the 2010 Decommissioning Environmental Impact Statement.
- NYSERDA believed that additional characterization and technical studies were needed.
- The Phased Decisionmaking Alternative provided an approach for conducting the additional studies without slowing down the cleanup process.
- A protocol for conducting these additional “Phase 1 Studies” has been developed and implemented. The process is managed jointly by DOE and NYSERDA with each agency paying 50 percent of the costs.

Phase 1 Studies

- **Potential Areas of Study:**
  - ✓ Soil erosion
  - ✓ Alternate approaches to and the cost of complete waste and tank exhumation
  - ✓ Viability, cost, and benefit of partial exhumation of waste, and removal of contamination
  - ✓ Exhumation uncertainties and benefit of pilot exhumation activities
  - ✓ In-place closure containment technologies
  - ✓ Engineered barrier performance
  - • Groundwater flow-and-contaminant transport
  - • Catastrophic release of contamination and impact on Lake Erie
  - • Slope stability and slope failure
  - • Seismic hazard
  - • Probabilistic versus deterministic dose and risk analysis
  - • Additional characterization needs
  - • Cost discounting and cost benefit analyses over long time periods

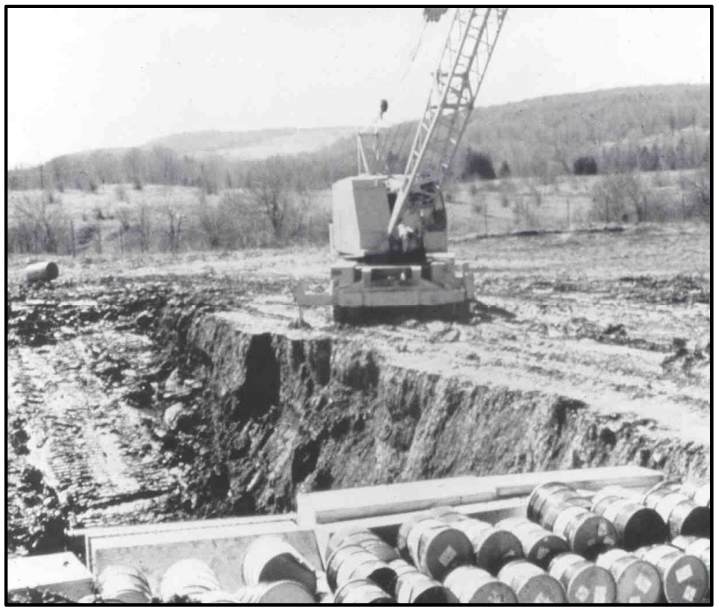
✓ Study area has been initiated
• Study area not yet initiated

West Valley Demonstration Project
Annual Federal Appropriation Since 1981



State-Licensed Disposal Area

- One of six commercial radioactive waste disposal facilities that began operation in the U.S. in the 1960s and 1970s.
- One of two radioactive waste disposal areas at the Center.
- 2.4 million cubic feet of waste disposed in 14 shallow land disposal trenches.
- Began operation in 1963. Shut-down in 1975 after accumulating water seeped from the trenches.
- NYSERDA took over management of the SDA in 1983.



SDA Performance and Improvements

Water Infiltration – Major issue for three decades:

- Water infiltration was a constant occurrence.
- Two trenches overflowed and seeped through the trench caps in 1975.
- Disposal operations ceased in 1975.
- Leachate pumping conducted by NFS and NYSERDA.

Infiltration Controls resolved this issue

1992 - South trench slurry wall and impermeable membrane cover installed

1995 - Additional membrane covers installed

2010 - South trench cover replaced

SDA Performance and Improvements

Soil erosion and slope destabilization – significant near- and long-term issue.

Engineered Erosion Controls are effectively keeping stream channels stable.

SDA Performance and Improvements

- Infiltration controls are keeping water out of the trenches.
- Active erosion monitoring and mitigation are keeping the streams and slopes stable.
- Environmental monitoring data show that the SDA is performing well.
- All regulatory requirements and permit conditions are being met.