West Valley Demonstration Project

West Valley Environmental Services

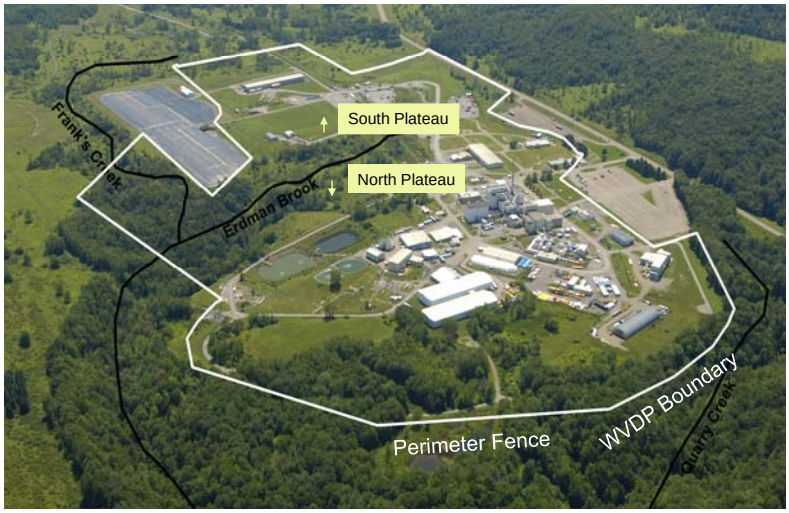
Permeable Treatment Wall Project

John Chamberlain

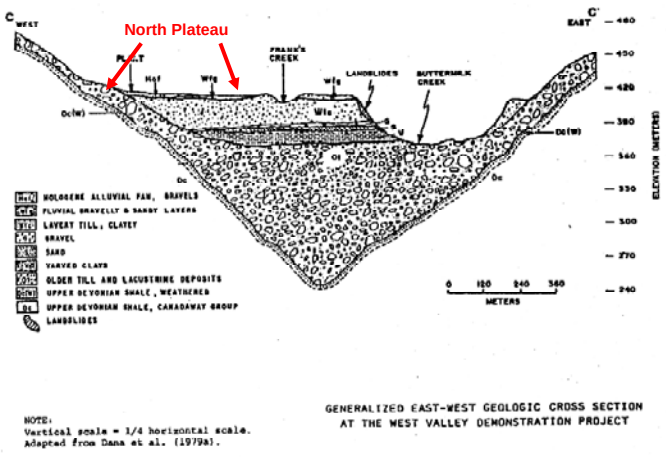
May 26, 2010

West Valley Citizen Task Force Meeting

West Valley Demonstration Project



Valley Cross Section



NOTE:
Vertical scale = 1/4 horizontal scale.
Adapted from Dana et al. (1979a).

GENERALIZED EAST-WEST GEOLOGIC CROSS SECTION AT THE WEST VALLEY DEMONSTRATION PROJECT

On the North Plateau, 10–30 feet of relatively permeable material occurs above a confining (low permeability) clay layer

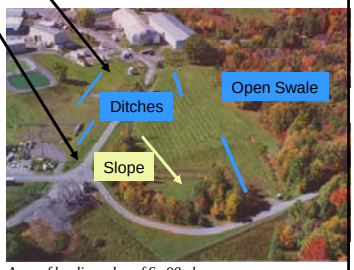
Precipitation that infiltrates in this area moves downward to the clay layer and then downgradient to the northeast

The groundwater surfaces at the edge of the plateau as seeps or springs

20614_3

Background – Groundwater Plume

- In late 1993, contaminated groundwater surfaced in ditches on the North Plateau
- Geoprobe® investigation (small diameter wells) was conducted in the summer of 1994 to determine nature and extent of contamination
- Contaminant involved is Strontium-90 (Sr-90) and has been attributed to a process line(s) leak(s) during reprocessing in the 1970s



Area of leading edge of Sr-90 plume

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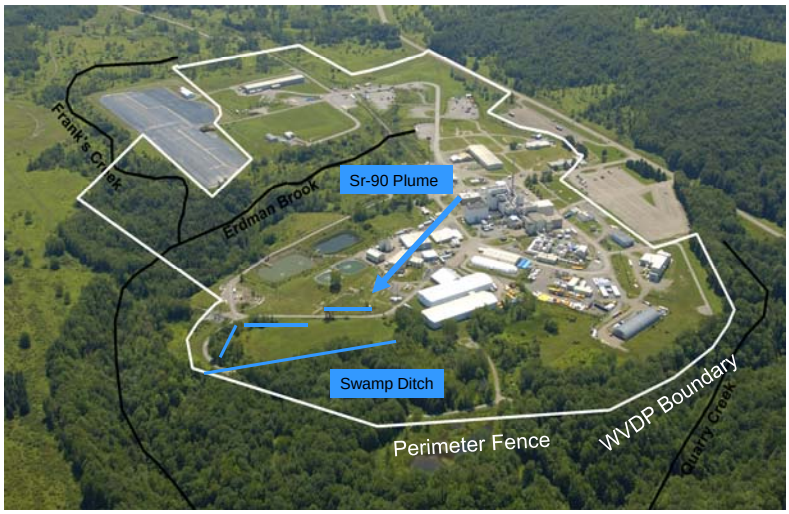
Background - Groundwater Plume



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Background – Groundwater Plume

- Pump and treat system installed in the fall of 1995 to mitigate surfacing and off-site movement of contaminated groundwater
- Between 1996 and 1998 surface water drainage changes made north of the Main Plant
- Pilot PTW installed in 1999
- Detailed evaluation of the pilot PTW completed in 2002

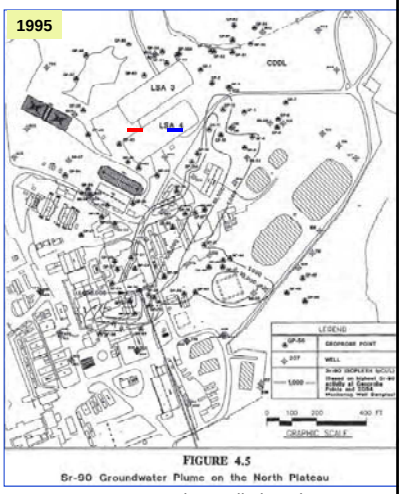

FIGURE 4.5
Sr-90 Groundwater Plume on the North Plateau

pumping wells location
pilot PTW location

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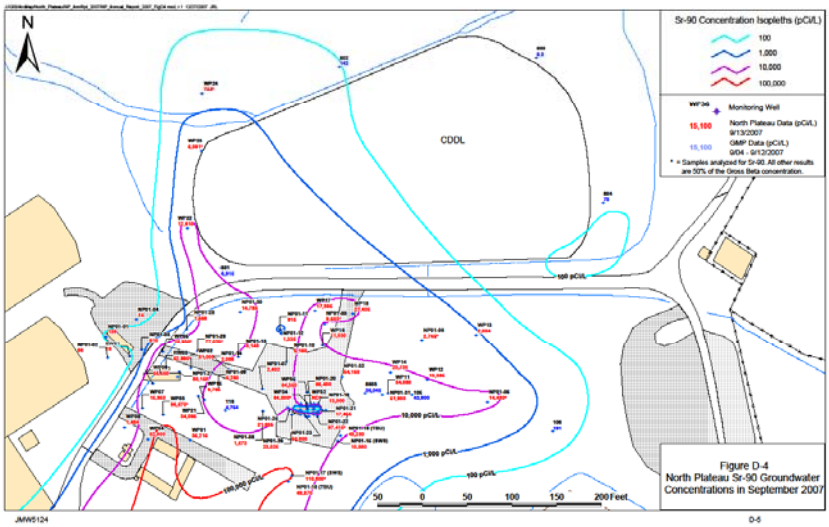
2007 Diagram of Plume



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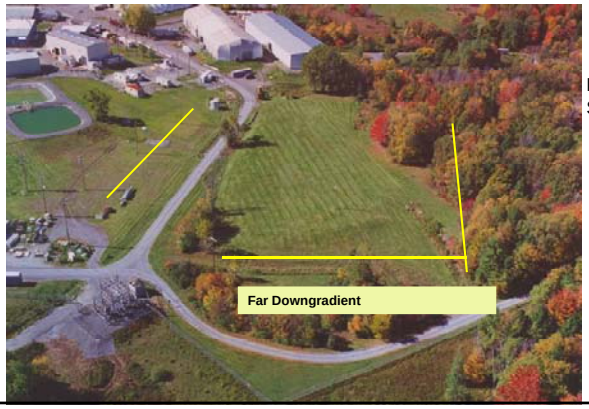
Alternatives Evaluated

Alternative 1	Maintain Current Approach
Alternative 2	Interceptor Trench Drain
Alternative 3	Groundwater Extraction Wells
Alternative 4	Far Downgradient Interceptor Trench Drain
Alternative 5	Far Downgradient Groundwater Extraction Wells
Alternative 6	In-situ Plume Treatment with Passive PTW
Alternative 6A	In-situ Plume Treatment with Active PTW
Alternative 7	Far Downgradient In-situ Plume Treatment with Passive PTW



Leading edge of Sr-90 plume

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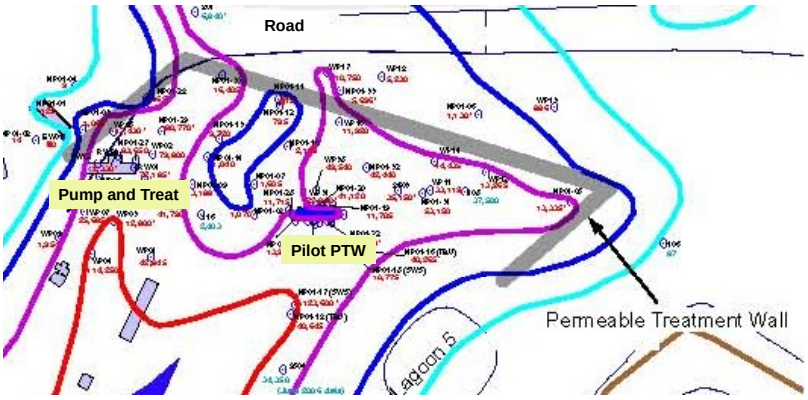
Alternative 6 Selected for Evaluation

In-situ Plume Treatment with Passive PTW



Note: 2007 concept for PTW location/dimensions was based on available field data.

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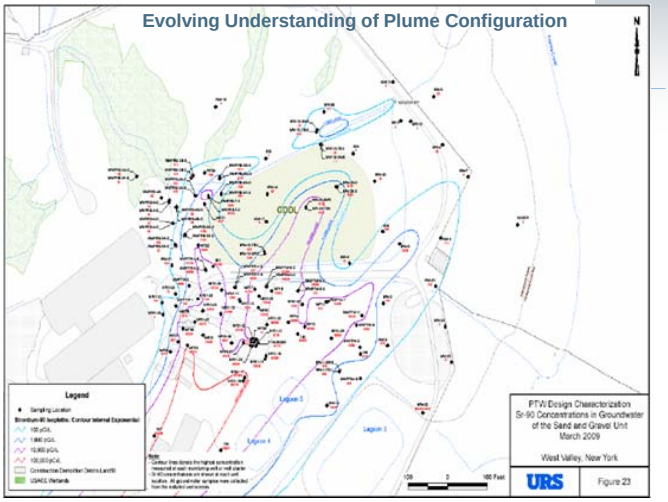
Leading Edge Characterization

- Placed more than 80 borings and microwells (2008-2009)
  - Characterized geology, hydrogeology, geochemistry in area of proposed PTW (10,000 pCi/L area)
  - Refined understanding of Sr-90 distribution to northern edge of plateau



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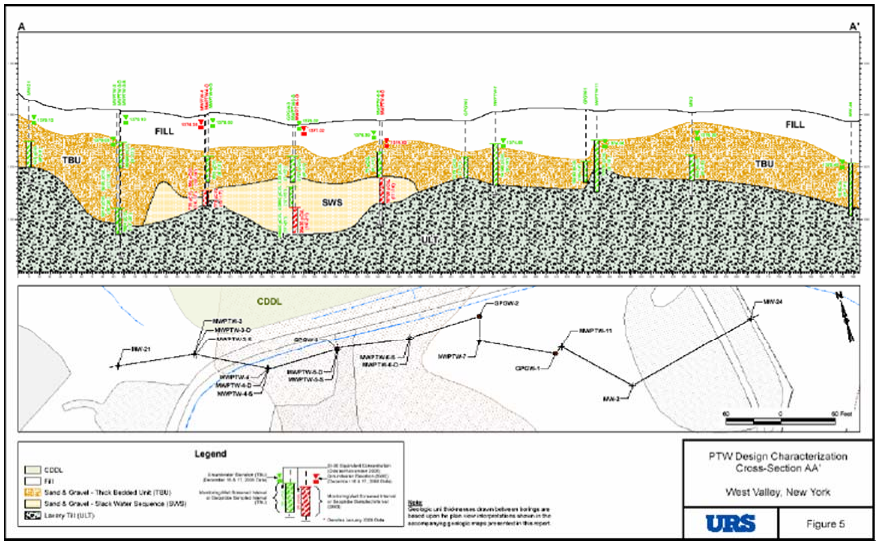
Hydrogeoligic Cross-Section

Along PTW Alignment



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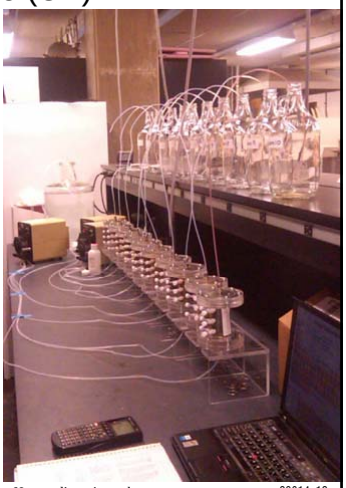
Laboratory Testing of Zeolites

- Two natural zeolites high in clinoptilolite content are being tested through the University at Buffalo (UB)
  - Grain size analysis
  - Permeability mineral composition
  - Cation exchange capacity
  - West Valley strontium specific removal (column tests)
    - Non-radioactive columns (at UB) using simulated groundwater; Sr-88 surrogate for SR-90, 5 key cations (Na, Ca, K, Mg, Sr)
    - Radioactive columns (at WVDP) using actual North Plateau groundwater (~50,000 pCi/L)



Non-radioactive column tests

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Bear River Zeolite - Idaho

Exposed section of zeolite

Bear River Mine

Truck being loaded with one ton bags of zeolite (20 bags /truck)

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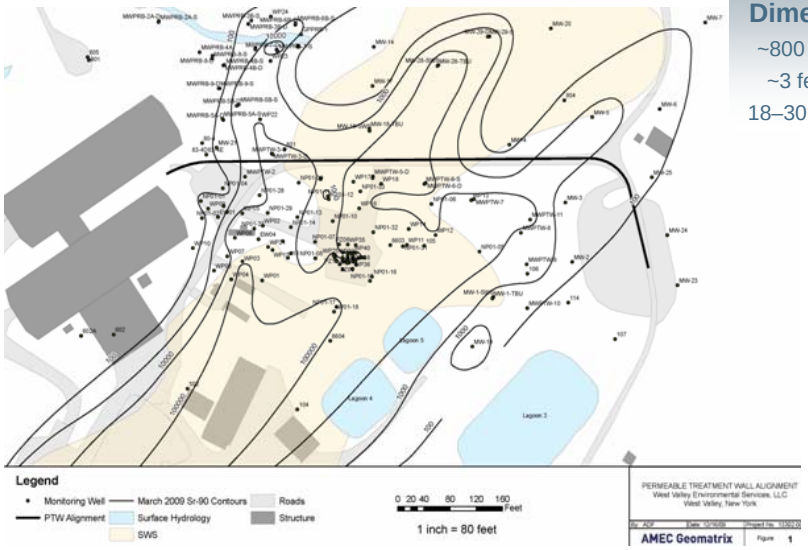
PTW Location

PTW Dimensions

~800 feet long

~3 feet wide

18–30 feet deep



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PTW Installation

- PTW installation is planned to be done with a continuous, one-pass trencher that cuts a trench and fills with media (zeolite) in one operation
  - Trencher allows installation of PTW without use of support piles or in-trench slurry avoiding possible impacts to permeability at soil-zeolite interface

Note: Trencher limited to approximately 30 foot excavation with 3-foot wide trench

Trencher equipped with 25' bar, 2' wide cutter

20614_15

Concept to Design to Installation

- Following have been established
  - PTW location
  - Media (zeolite) to use
  - Installation approach (one-pass trencher)
- Focus now on installation (construction)
  - Equipment access, operation, decontamination
  - Soil management
  - Surface water drainage
  - Contingencies

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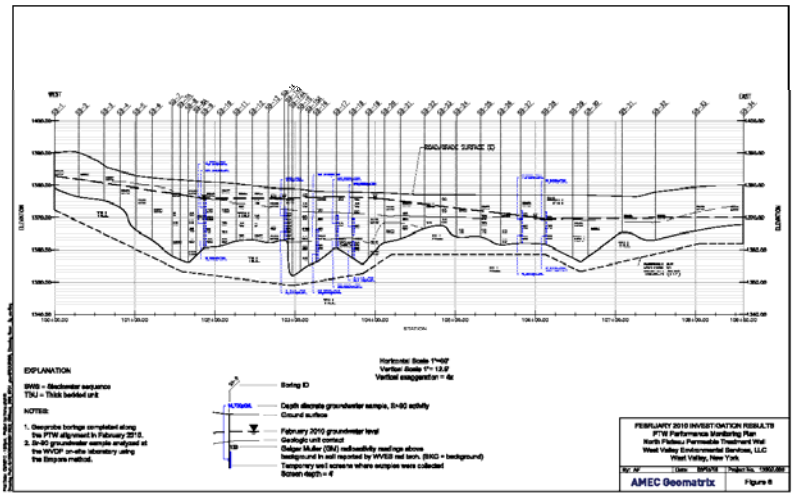
Alignment Borings



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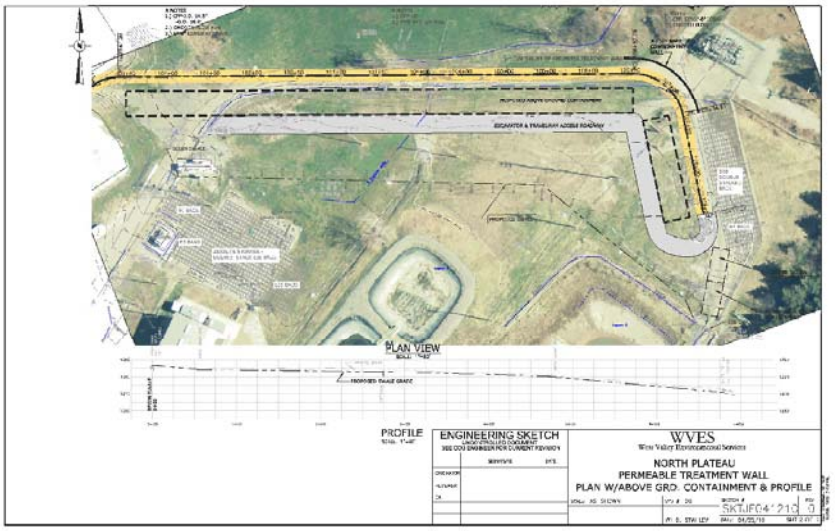
PTW Installation



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PTW Installation

20614_19

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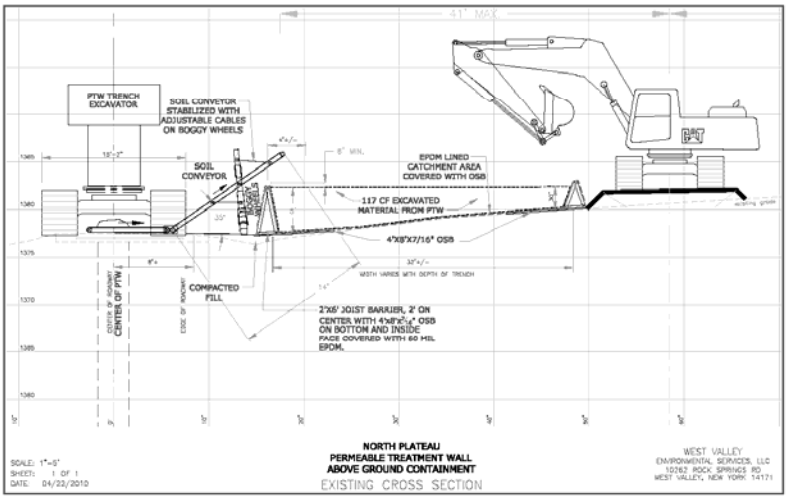
PTW Installation



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PTW Installation

- Projections (approximate)
  - 800-feet long, 3-feet wide, 18-30-feet deep
  - 75,000 cubic feet of soil excavated
  - 2,000 metric tons of zeolite

Status as of May 26, 2010

- Formal design done
- First shipment of zeolite received in May with shipments planned through mid-summer
- Work focused on requests for proposals for trencher and general contractor
- Site preparation targeted to begin in mid- to late summer
- PTW installation (trenching) fall 2010