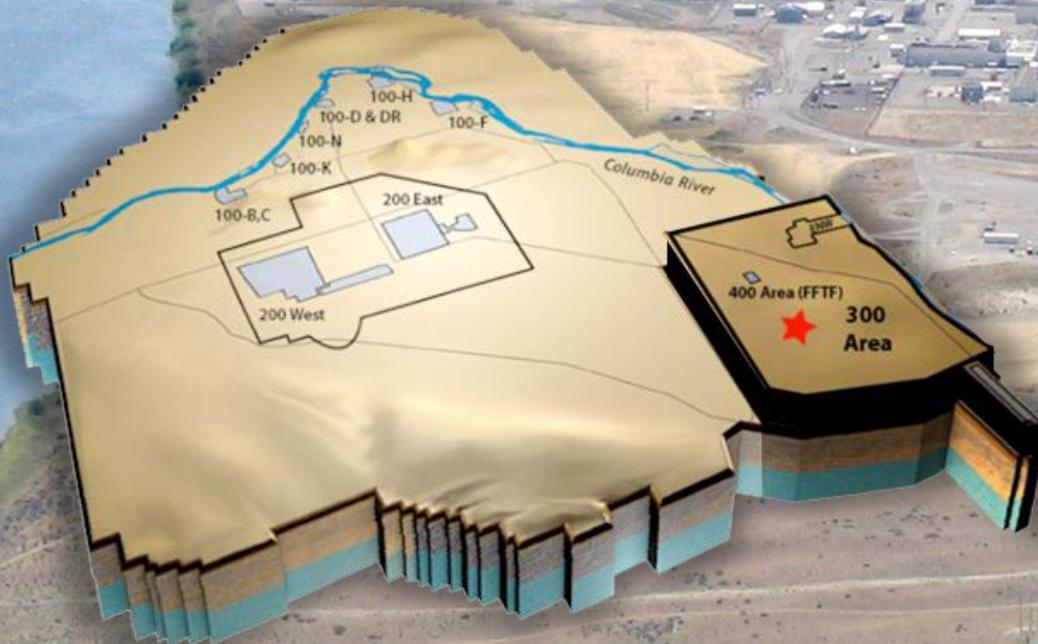




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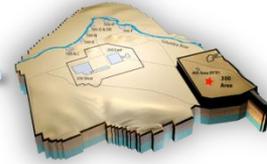
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Overview Organization

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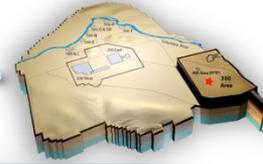
- 300 Area Location/Nature & Extent of Contamination
- Risk-Driving Contaminates of Concern & Remedial Action Objectives
- Cleanup Progress under Existing Record of Decision for Interim Action
- Common Elements in Remedial Alternatives 2-5
- Uranium Conceptual Model & Remedial Alternatives Evaluated in Proposed Plan



300 Area Location

Looking North From Richland, WA

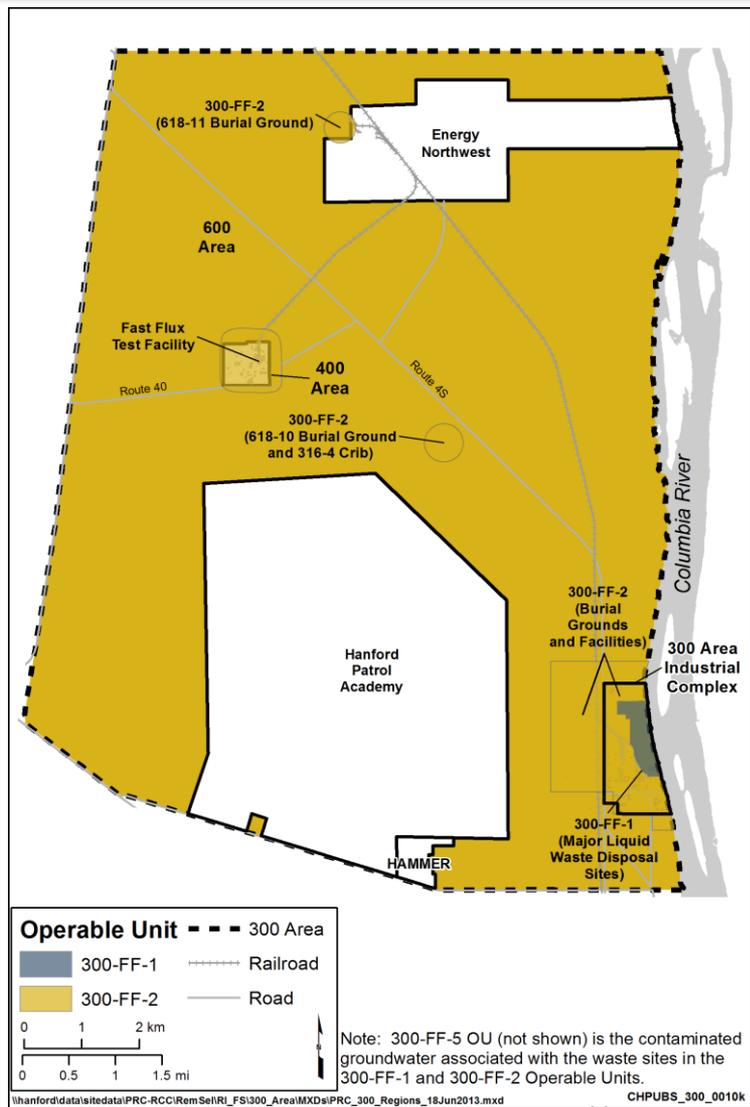
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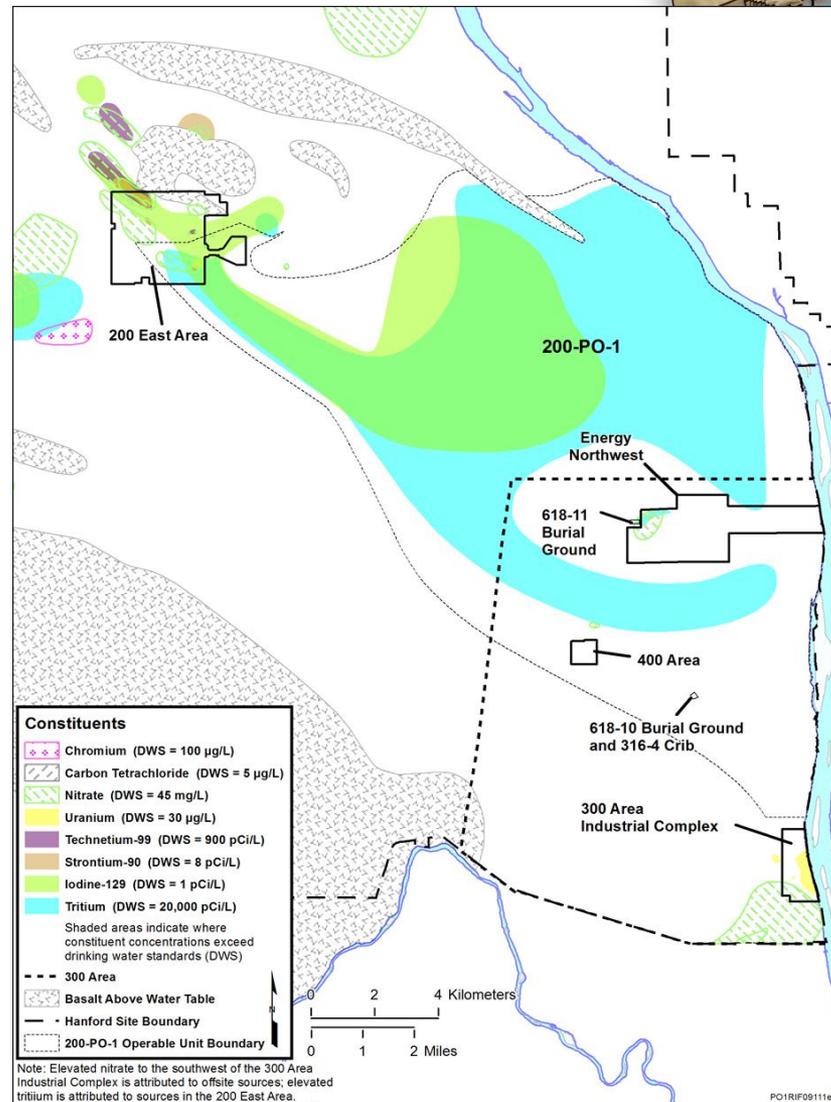
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300 Area Operable Unit and Constituents

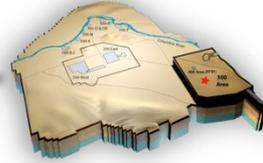


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Primary Risk-Driving Contaminants of Concern

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- Soils

- Uranium (metal)
- Uranium isotopes
- Cesium-137
- Cobalt-60
- Strontium-90
- PCB Aroclors

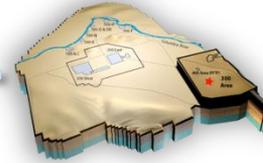
- Groundwater

- Gross Alpha (U)
- Uranium (metal)
- Tritium
- Nitrate
- Volatile Organics (TCE & DCE)



Remedial Action Objectives (RAOs)

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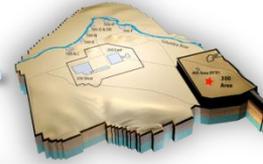


- RAO 1. Prevent human exposure to groundwater containing COC concentrations above PRGs.
- RAO 2. Prevent COCs migrating and/or leaching through soil that will result in groundwater concentrations above PRGs for protection of groundwater, and of surface water at locations where groundwater discharges to surface water.
- RAO 3. Prevent human exposure to the upper 4.6 m (15 ft) of soil and structures and *debris* contaminated with COCs at concentrations above PRGs for residential use in areas outside both the 300 Area Industrial Complex and waste site 618-11 (adjacent to Energy Northwest).
- RAO 4. Prevent human exposure to the upper 4.6 m (15 ft) of soil and structures and debris contaminated with COCs at concentrations above PRGs for industrial use in the 300 Area Industrial Complex and waste site 618-11 (adjacent to Energy Northwest).
- RAO 5: Manage direct exposure to contaminated soils deeper than 4.6 m (15 ft) to prevent an unacceptable risk to human health and the environment.
- RAO 6. Prevent ecological receptors from direct exposure to the upper 4.6 m (15 ft) of soil and structures and debris contaminated with COCs at concentrations above PRGs.
- RAO 7. Restore groundwater impacted by Hanford releases to PRGs within a timeframe that is reasonable given the particular circumstances of the site.



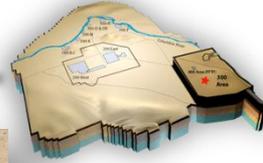
300 Area Recent Remediation Progress

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300 Area – Example of Facilities that have been Demolished

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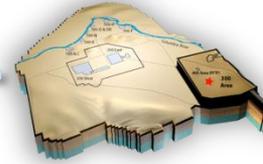


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300 Area Progress & Challenges

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- Challenges

- High radiation source removals (618-11, 618-10, 340 vault, soils below 324 Building)

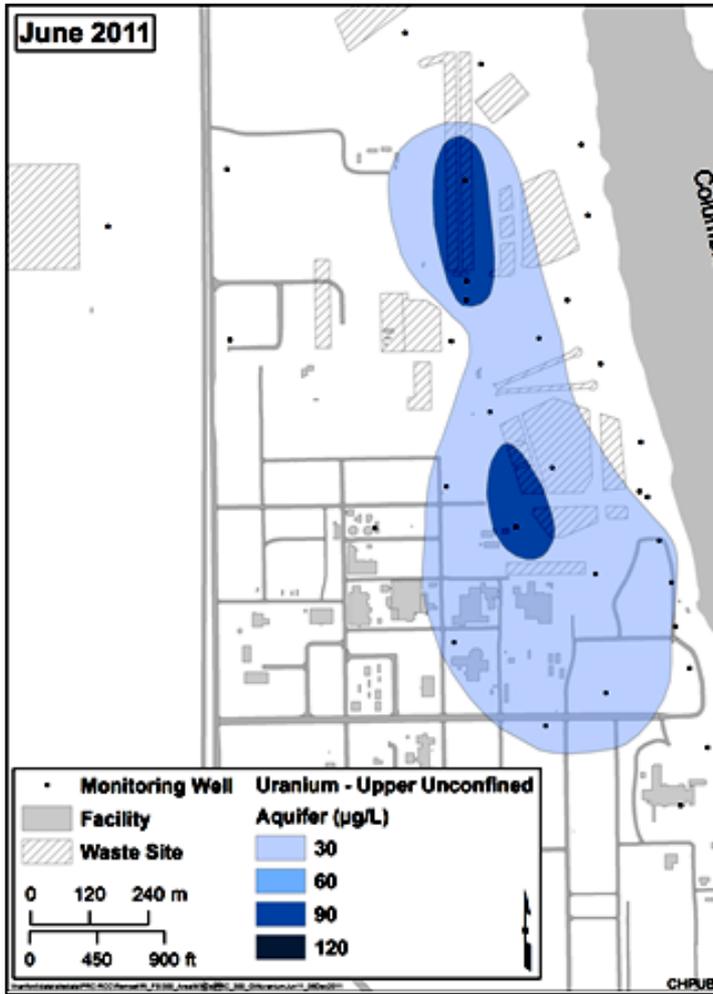


- Progress

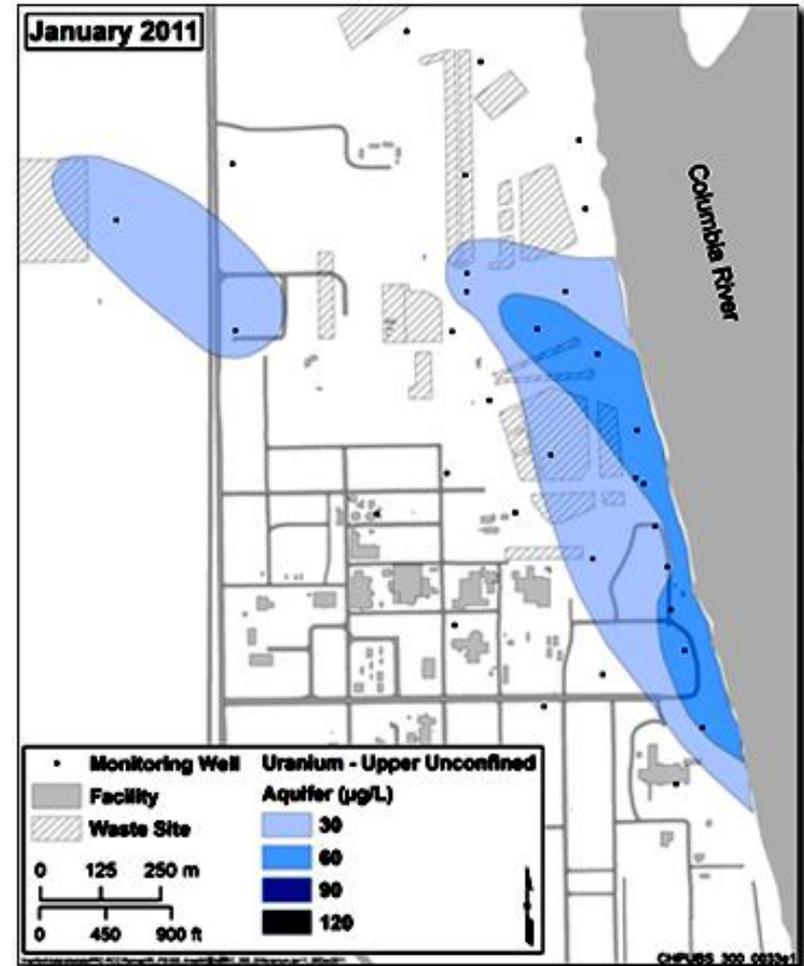
- Nearly 1 Million tons contaminated soil & debris excavated and disposed at ERDF
- ~38 tons suspected transuranic waste removed & shipped to Central Waste Complex
- All but ~ 34 of 130 waste sites have been remediated

Persistent & Dynamic Uranium Plume

Hanford 300 Area CERCLA Proposed Plan



High River Stage



Low River Stage



1975-1985 Process Trenches in Use

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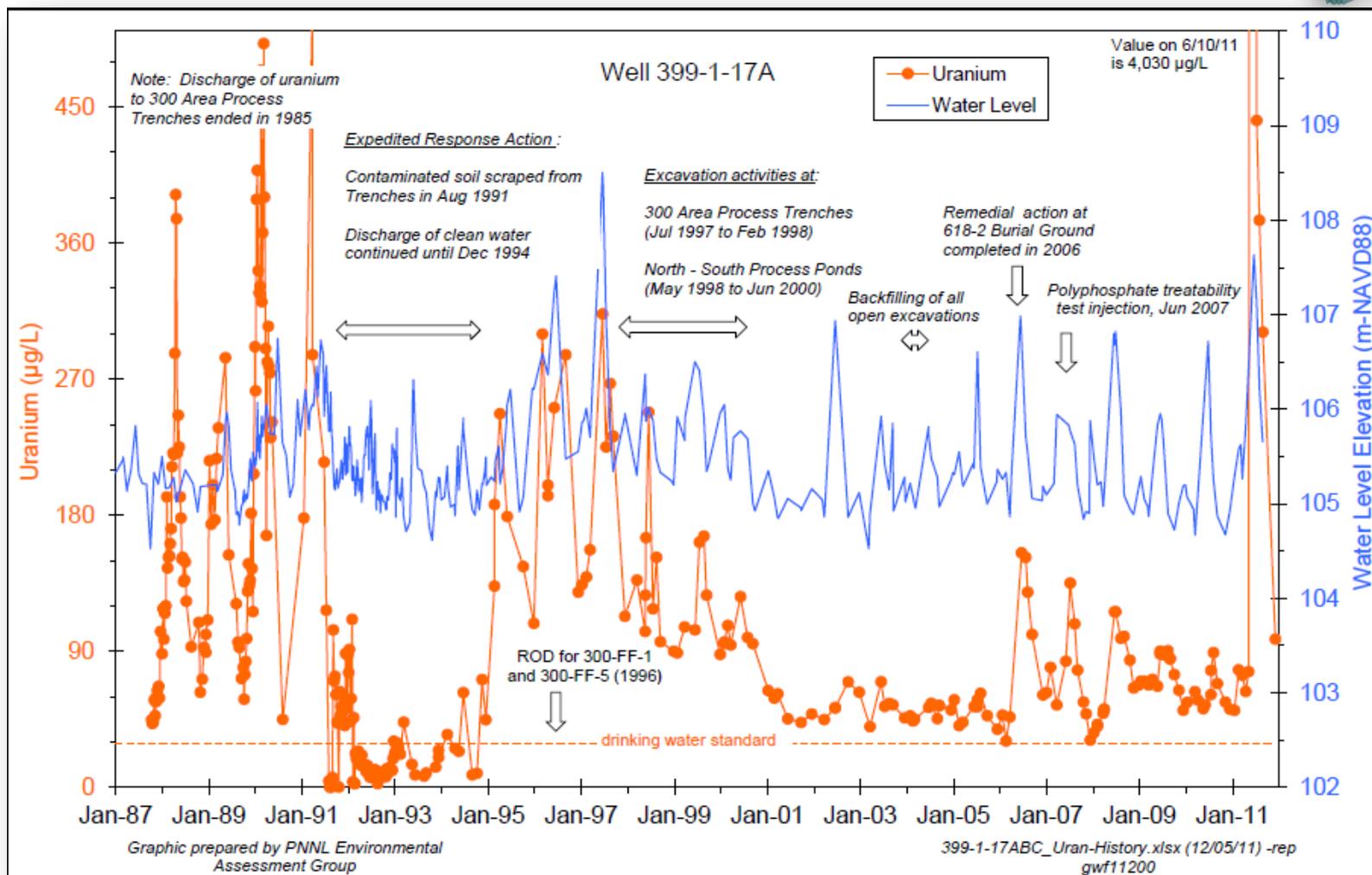
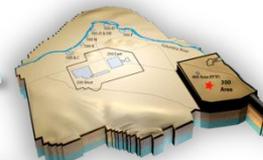


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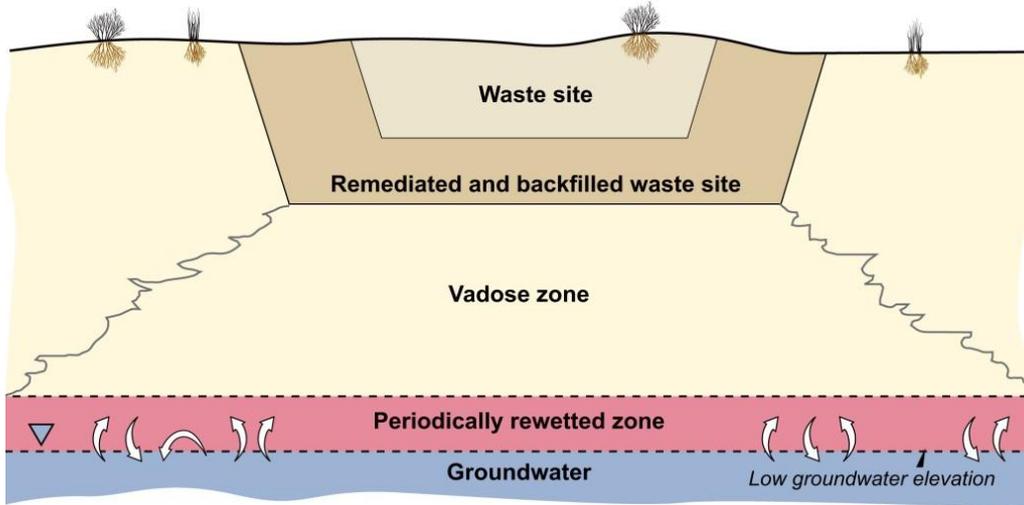
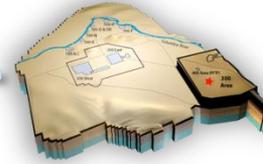
Observed U Behavior to River stage and Remedial Actions

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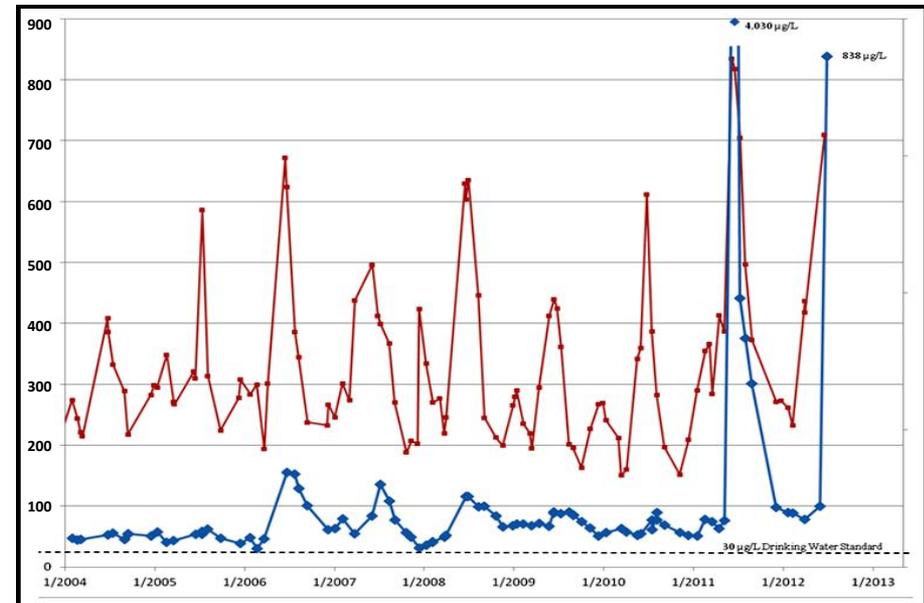


Challenge: GW Cleanup Requires Addressing U in PRZ

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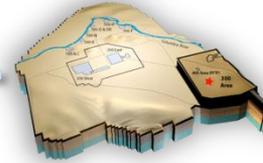


- Primary source of U to GW is the PRZ; ~30% of remaining U inventory is periodically saturated with high bicarbonate GW, replenishing the U plume in GW



Common Elements of the Active Remedial Alternatives

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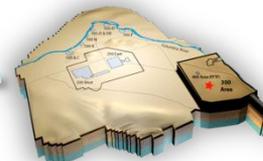


- Remove/Treat/Dispose (RTD) contaminant sources;
- GW Monitoring for uranium attenuation and Nitrate;
- Monitored Natural Attenuation (MNA) for tritium and organic chemicals; and,
- Institutional controls (IC's) to control access to GW & manage surface infiltration until standards are met.



Remedial Alternatives Described in The Proposed Plan

Hanford 300 Area CERCLA Proposed Plan



Alternative 1

- No Action

Alternative 2

- Groundwater Monitoring (GW may reach remediation goals in <50 yrs.

Alternative 3

- Two phases of Uranium Sequestration, MNA for tritium & organics and GW Monitoring for U plume

Alternative 3a

- “Enhanced Attenuation” Focused 3 Acre U sequestration, MNA for tritium & organics and GW Monitoring for U & nitrate plumes

Alternative 4

- Uranium Sequestration, Focused Deep RTD, and Groundwater Monitoring

Alternative 5

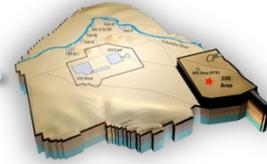
- Expansive deep RTD and Groundwater Monitoring

Reminder: Alternatives 2-5 include completion of RTD cleanup actions required in RODs for Interim Action; monitoring component for uranium; MNA for tritium and organic chemicals, and institutional controls to control access to GW & manage surface infiltration.



Groundwater Cleanup Goals

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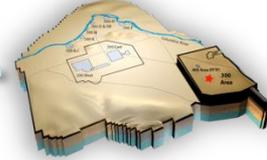


- Groundwater cleanup is driven by three factors,
 - Mitigate risk to human health from exposure to or consumption of contaminated groundwater,
 - Mitigate risk to the environment where the contaminated groundwater discharges in the riparian (shoreline) and hyporheic (river bed) zones, and
 - Restoration of the contaminated groundwater to its highest beneficial use, generally determined to mean meeting drinking water standards, within a time frame that is reasonable given the particular circumstances of the site.” EPA - 40 CFR 300.430(a)(1)(iii)(F).



Exposure to Contaminated 300 Area Groundwater

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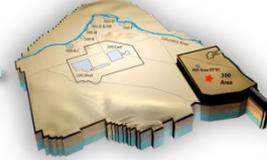


- U-contaminated GW is located in the core industrial zone; no residential use planned for the foreseeable future
- Existing alternative water supply; Potable water to the industrial core area is provided by the City of Richland
- U mass flux to the Columbia River represents 2-8% of total U loading the Hanford Reach. ~100-150 kg/yr U from 300 Area vs. ~1600 kg/yr from irrigation returns. Downstream, the Yakima River U flux to the Columbia River is ~4,000 kg/yr
- U concentrations upwelling through river substrate at times exceed federal DWS but do not exceed levels of environmental concern
- There is no statistical difference between U concentrations upstream vs. downstream of Hanford



Aquifer Restoration is Driving the Cleanup Decision

Hanford 300 Area CERCLA Proposed Plan



- Restoration of the aquifer (achieve federal DWS) within a time frame that is reasonable given the particular circumstances of the site.” EPA - 40 CFR 300.430(a)(1)(iii)(F).
- Primary source of U contamination contaminating GW is the mobile fraction of U in the PRZ; seasonal high water continues to feed U to GW.
- ~1% of remaining inventory is dissolved in GW; ~ 100-150 kg/yr U removed from the aquifer/yr (transported to the river)
- Size and mass of the U plume exceeding DWS varies in accordance with river stage conditions, varying between 0.4 – 0.5 square km and 40-83 kg
- Attenuation of the U plume to CERCLA EPC cleanup levels is estimated to be 30-40 years; ~ 200 yrs. to achieve < DWS in all wells all the time

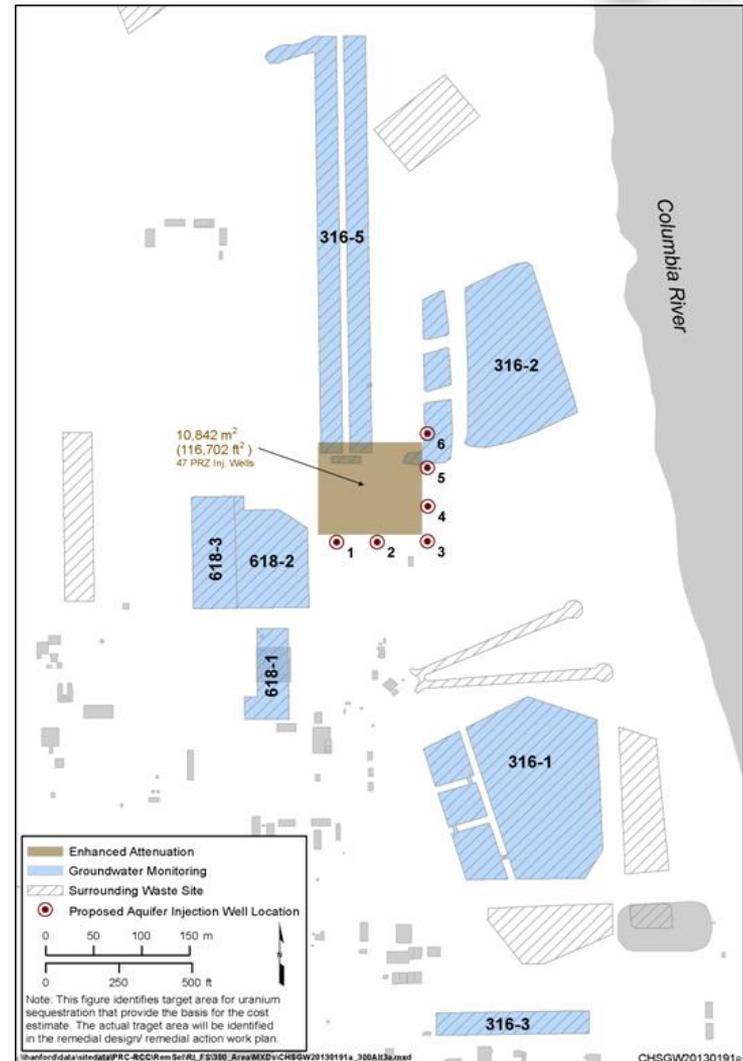


Preferred Alternative (3a) Enhanced Attenuation

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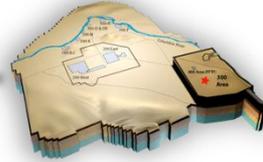


- 130 total waste sites
 - 38 no action
 - Removal, Treatment, and Disposal (RTD): 74 to industrial standards; 12 to residential standards
 - only 34 of 130 sites to RTD post ROD; 7 sites associated with enhanced attenuation
- Enhanced Attenuation for Uranium in the vadose zone and Periodically Rewetted Zone (PRZ);
 - Treatment of 3 acre area using uranium sequestration to immobilize the deep uranium contamination in the vadose zone and PRZ that is the highest source of contamination in groundwater
- Monitored Natural Attenuation (MNA) for tritium and organic chemicals in groundwater
- Groundwater Monitoring and Institutional Controls (ICs) for uranium, gross alpha, and nitrate in the groundwater. ICs are used to control access to residual contaminants in soil and groundwater as long as they exceed the cleanup levels as established in the Record of Decision associated with this Proposed Plan.



How you can provide input

Hanford 300 Area CERCLA Proposed Plan



- Public Comment period July 15 – September 16
- Provide verbal comments during this meeting
- Submit written comments to 300AreaPP@rl.gov
- The TPA agencies will consider all comments before making a decision
- A Record of Decision will include responses to comments

