



U.S. DEPARTMENT OF  
**ENERGY**

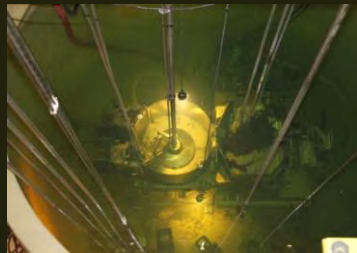
Richland  
Operations Office

# Hanford Advisory Board *DOE-RL Update*

Matt McCormick

*DOE-RL*

*November 1, 2012*





# The 2015 Vision

## Hanford Site Cleanup

# Safe and Effective Cleanup that Protects the Columbia River

### Richland Operations Office

- Reduces the Active Site Footprint of Cleanup to 75 Square Miles (586 to 75)
- Significantly Reduces Long-Term Mortgage Costs
- At Completion, Shifts Emphasis and Resources to Full Scale Cleanup of the Central Plateau (75 square miles)
- Reduces Costs by "Right Sizing" Hanford's Infrastructure via a Mission Support Contract
- Minimizes Injury to Natural Resources

### B & C Area

- ✓ Interim Safe Storage of C Reactor Complete
- ✓ B Reactor Designated as a Museum or Interim Safe Storage Complete
- ✓ All B & C Area Final ROD Remedial Actions Complete
- ✓ All B & C Area Groundwater Remedies Implemented
- ✓ 6 Facilities Demolished
- ✓ 40 Waste Sites Remediated
- ✓ ~381,000 Tons of Soil Removed
- ✓ **Additional Scope:** Extensive Chromium Contamination at the B/C Area (C-7), dug trench to groundwater to removed source

### N Area

- ✓ Interim Safe Storage of N Reactor Complete
- ✓ All N Area Final ROD Remedial Actions Complete and TSD Units Closed
- ✓ All N Area Groundwater Remedies Implemented
- ✓ 108 Facilities Demolished
- ✓ 61 Waste Sites Remediated
- ✓ ~157,000 Tons of Soil Removed
- ✓ **Additional Scope:** Discovery of additional waste sites and additional contamination from past transportation fuel spills

### D & H Area

- ✓ Interim Safe Storage of D, DR, and H Reactors Complete
- ✓ All D & H Area Final ROD Remedial Actions Complete
- ✓ All D & H Area Groundwater Remedies Implemented
- ✓ 16 Facilities Demolished
- ✓ 56 Waste Sites Remediated
- ✓ ~1,700,000 Tons of Soil Removed
- ✓ **Additional Scope:** More extensive chromium contamination and discovery of additional waste sites

### K Area

- ✓ K East Basin Demolished
- ✓ Interim Safe Storage of K East Reactor Complete
- ✓ K West Sludge Removed from the River Corridor
- ✓ Interim Safe Storage of K West Reactor Initiated
- ✓ All K Area Final ROD Remedial Actions Complete and TSD Units Closed with the exception of those associated with K West
- ✓ All K Area Groundwater Remedies Implemented
- ✓ 2,300 Tons of Scrap Nuclear Fuel Removed
- ✓ 109 Facilities Demolished
- ✓ 2 Waste Sites Remediated
- ✓ ~361,000 Tons of Soil Removed
- ✓ **Additional Scope:** Additional waste sites and contamination resulting from past operations.

### IU2 & IU6 Area

- ✓ Interim Safe Storage of F Reactor Complete
- ✓ All IU2 & IU6 Area Final ROD Remedial Actions Complete
- ✓ All IU2 & IU6 Area Final ROD Groundwater Remedial Actions Complete
- ✓ 1 Facility Demolished
- ✓ 50 Waste Sites Remediated
- ✓ ~962,000 tons of Soil Removed

### Central Plateau Cleanup

- ✓ All 200 West Carbon Tetrachloride, Uranium and Technetium 99 Groundwater Remedies Implemented
- ✓ Conduct Additional Cleanup as Funds Become Available

### Plutonium Finishing Plant Complex

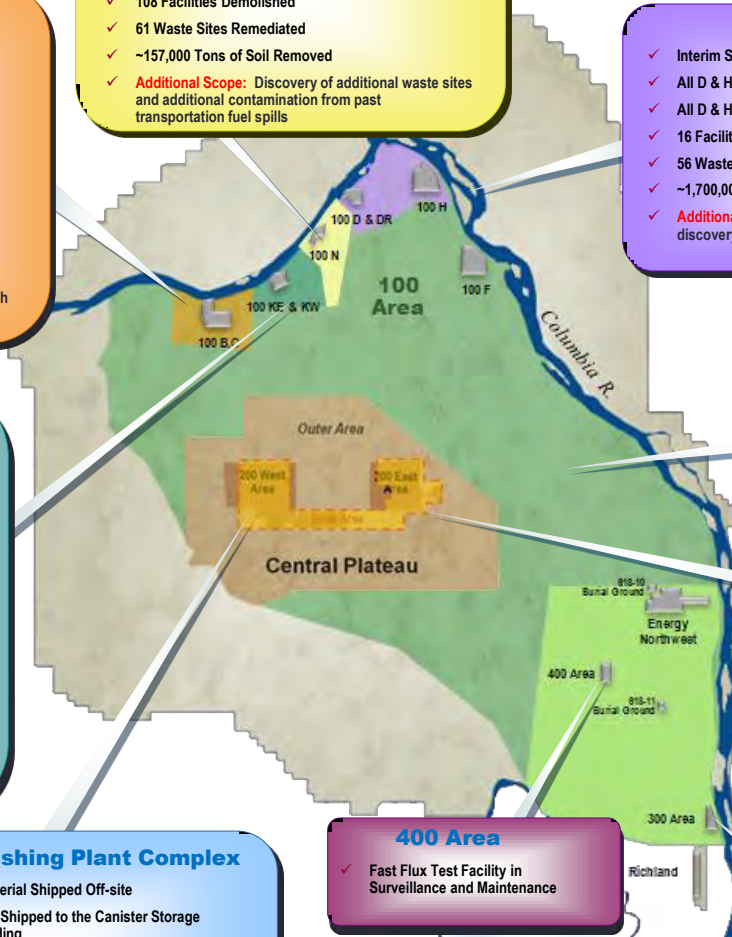
- ✓ All Special Nuclear Material Shipped Off-site
- ✓ Slightly Irradiated Fuel Shipped to the Canister Storage Building for Safe Guarding
- ✓ PFP Complex Reduced to Slab on Grade
- ✓ 18 Facilities Demolished
- ✓ **Additional Scope:** Additional plutonium found inside plant facilities and found adhered to piping, process equipment, exhaust ducts, and filters. (~10kg)

### 400 Area

- ✓ Fast Flux Test Facility in Surveillance and Maintenance

### 300 Area

- ✓ All 300 Area Final ROD Remedial Actions Complete and TSD Units Closed
- ✓ All 300 Area Groundwater Remedies Implemented
- ✓ 186 Facilities Demolished
- ✓ 95 Waste Sites Remediated
- ✓ ~923,000 Tons of Soil Removed
- ✓ Final Remediation of 618-10 & 618-11 Burial Grounds Complete
- ✓ **Additional Scope:** Discovery of high-level radioactive contamination below 324 Building



IU = Isolated Unit  
 ROD = Record of Decision  
 TSD = Treatment, Storage, Disposal



Placed 78% (7 of 9) of nuclear reactors in Interim Safe Storage/Dispositioned



Demolished 77% (357 of 458) of contaminated/excess facilities and 60% of Category II/Category III nuclear facilities



Remediated 68% (681 of 995) of waste sites



Disposed more than 14 million tons of contaminated waste in Environmental Restoration Disposal Facility



100-K Area is 100% nuclear fuel free; 100% of Knock-Out Pot material in interim storage; remainder of radioactive sludge is 100% containerized; design/test systems and components to transfer the sludge to the Central Plateau for interim storage is 85% complete.



Treated 6.4 billion gallons of contaminated groundwater, removing more than 8 tons of contaminants



Completed 60% of Plutonium Finishing Plant decommissioning, including 100% of special nuclear material shipped offsite, 180 of 238 glove boxes dispositioned, 100 of 196 pencil tanks removed, and 32 of 46 facilities demolished



Reduced active cleanup footprint by 73% (425 of 586 square miles)





The Vision set a challenging scope of work that could potentially be accomplished by 2015

The Vision made an assumption of a stable funding of \$1.040B for the Richland Operations Office from 2012-2015

The \$1.040B funding level has not been realized. Fiscal Year 2012 was about \$20M below Vision requirements  
Fiscal Years '13, '14, and '15 may also be below this level

Significant progress has been made toward the 2015 Vision, with three years left to go



The Richland Operations Office continues to aggressively pursue 2015 Vision goals. Much has been accomplished to date and we anticipate the vast majority of the Vision will be complete in the remaining three years

The amount of work to be done has increased within the 2015 Vision

**Increased Scope:**

- High levels of radioactive contamination found under the 324 building
- 170 new waste sites requiring remediation in the River Corridor
- More extensive chromium contamination near Columbia River (costing \$107M)



# The 2015 Vision

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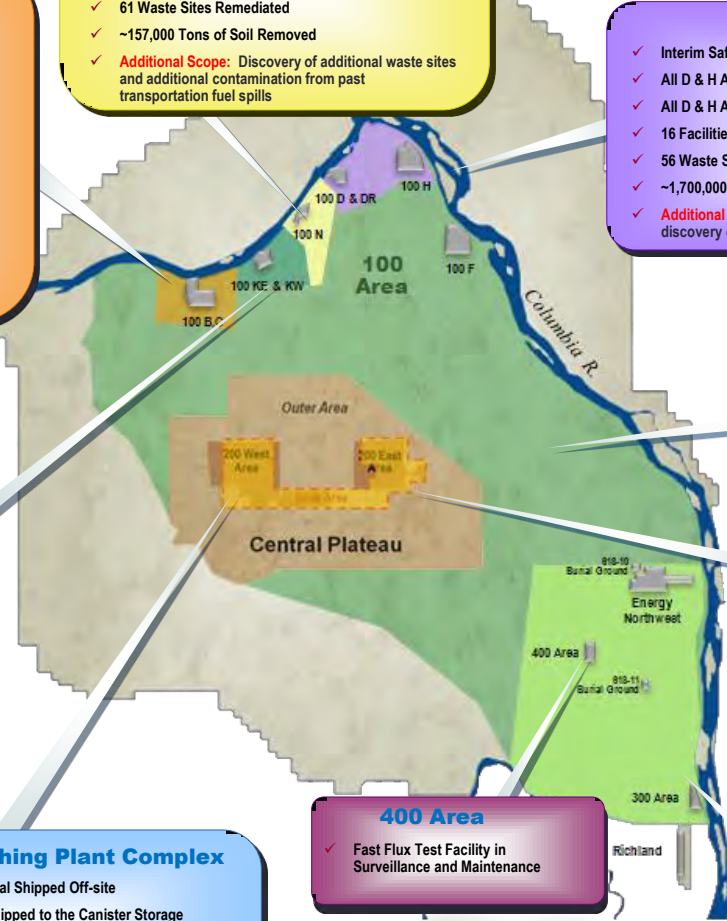
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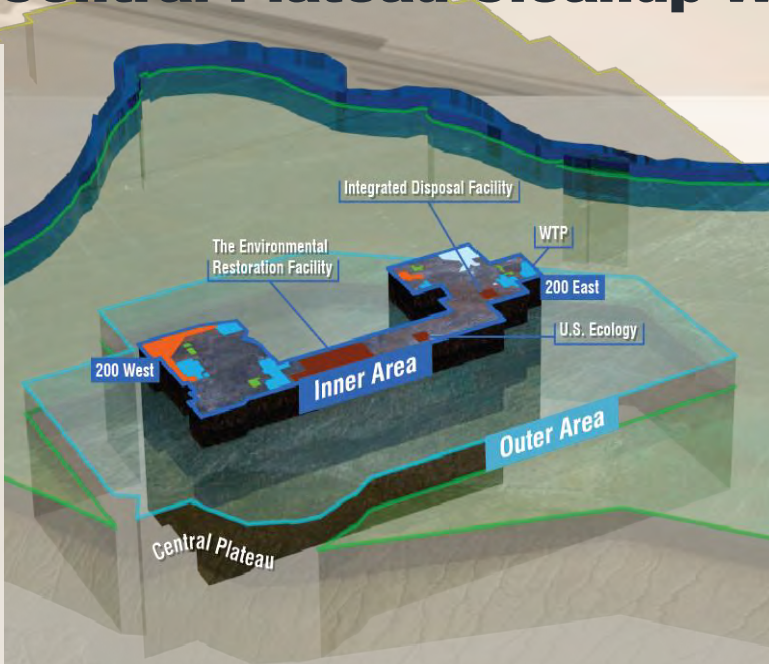
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### Hanford's Central Plateau Cleanup Work Scope

#### Legacy Waste and Spent Fuel Management

- Complete retrieval of about 5,000 cubic meters of stored contact and remote-handled transuranic waste
- Process and ship transuranic waste to Waste Isolation Pilot Plant, including stored legacy waste and new waste generated from cleanup activities
- Place cesium and strontium capsules into dry storage from wet storage
- Continue safe secure operation and storage of 2,100 metric tons of Category 1 irradiated fuel Package and transport used fuel to a national repository or consolidation center
- Treat and dispose of low-level radioactive waste currently in storage and new waste generated from cleanup activities
- Operate low-level waste disposal facilities (the Environmental Restoration Disposal Facility, Mixed Low-Level Waste Trenches 31 & 34, Integrated Disposal Facility) as needed to dispose of legacy and cleanup waste
- Operate waste management facilities as needed to support Hanford cleanup (Effluent Treatment Facility, Waste Receiving and Processing, and Liquid Effluent Retention Facility)



#### Waste Site Remediation

- Remediate over 1,100 waste sites\*
  - Liquid and soil discharge site that received over 450 billion gallons of liquid waste
  - Over 40 acres of solid waste disposal trenches
  - Over 100 waste sites in the outer area
- Operate the soil vapor extraction facility that is removing carbon tetrachloride from the soil in the 200 West Area

\* Not including tank farms

#### Building Deactivation, Decontamination, Decommissioning, and Demolition

- Demolish 5 large chemical processing canyons
- Demolish over 600 excess facilities (970 originally, 332 demolished to date) ranging from complex nuclear facilities to small shacks and sheds

#### Groundwater Remediation

- Contain key contaminants so that they do not reach the Columbia River and treat contaminated groundwater per CERCLA Records of Decision
- Operate the 200 West Pump and Treat System at a nominal rate of 2,000 gallons per minute
- Expand the 200 West pump and treat system as needed to implement Records of Decision for cleanup of Central Plateau groundwater

# River Corridor: F Reactor First Reactor Area To Be Cleaned Up



- F Area cleaned up to interim action ROD requirements.
- 112 facilities demolished, 88 waste sites remediated, and 1.5 million tons of waste disposed of at the ERDF.
- Revegetation will be completed during planting season this winter.



**100-F Reactor Area during operations**



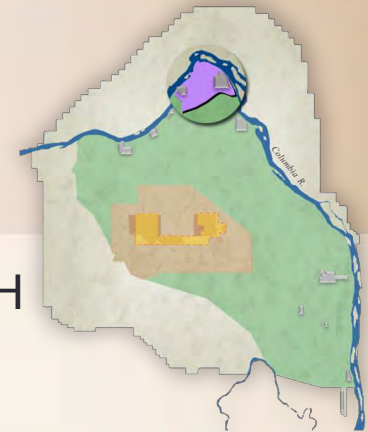
**Removed more than 150,000 tons of waste material and chrome contamination from 100-F-57 waste site.**



**100-F Area in 2012**



# D/H Reactor Area



- New subcontract to complete waste site remediation at 100-D/H Areas awarded in October.
  - 43 waste sites left to remediate.
- Remediation of 100-D-100 deep chromium contamination should resume in December and complete in late 2013.
  - Work to relocate power lines and groundwater wells scheduled to complete in December 2012.
- Remediation of other deep chromium contamination will start later in 2013.
- No issues noted.





# N Reactor Area



- Completed TPA milestone M-93-20, Complete 105-N Reactor ISS, on Sept. 20, 2012.
- Subcontract to complete 100-N Area remediation work awarded in Sept. 2012.
  - 98 waste sites to go with 62 already in closure verification process.
- Removal of the shoreline facilities is complete. Final in-river work will complete during low river levels.
- In-situ bioremediation system to treat deep petroleum contamination being installed and should be operational in November 2012.
- Continuing to investigate extent of petroleum contamination from numerous spills throughout the reactor area.

# KW Reactor Area

- Tom Teynor awarded the Secretarial Excellence Award for his leadership of the Sludge Treatment Project team removing critical risk, spent nuclear fuel and K Basin sludge
- Completed the last shipment of highly radioactive knock-out pot sludge from the K West Reactor Basin to safe storage at the Canister Storage Building on the Central Plateau
- Completed the Engineered Container Retrieval and Transport System (ECRTS) Process System Final Design Report. The ECRTS will be instrumental in removing the remaining sludge from the basin



*Sludge Project Federal Project Director Tom Teynor, DOE-RL, receiving Secretarial Excellence Award from Secretary of Energy Steven Chu*



*Packing and transporting Multi-Canister Overpacks to Hanford's Central Plateau. This was the first sludge stream to be removed from the basin.*

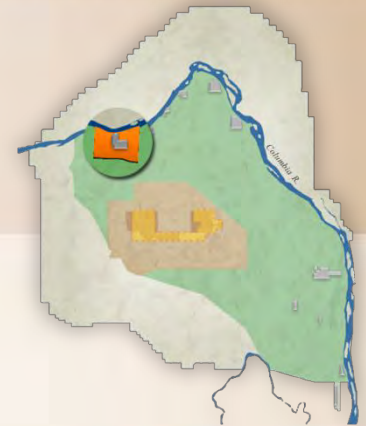


# KE Reactor Area

- Continuing preparations to support eventual cocooning or Interim Safe Storage (ISS) of the 100-KE Reactor
  - Remediating waste sites around the reactor
  - Sealing above and below grade KE Reactor Building openings with concrete pourbacks (plugs) & metal coverings
  - Removing hazardous materials (oil, glycol, lead, asbestos, mercury switches, etc.)



# B/C Waste Sites



- Remediation of sidewall contamination at 100-C-7:1 restarted and is expected to complete in January 2013.
- Groundwater study by PNNL in bottom of C-7:1 was completed in August.

# River Corridor: 300 Area



*327 Building during hot cell removal*

Significant progress continues in the 300 Area

- Backfilling of 300 Area waste sites in progress.
- 329 building above grade demolition will complete in December.



*After demolition and backfill*

# River Corridor: 300 Area

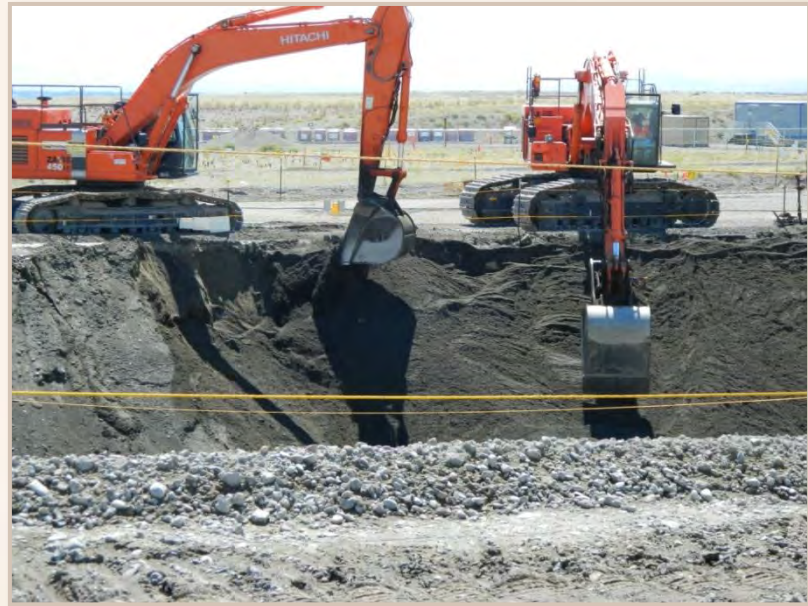


- The 340 Vault weighs 1,100 tons
  - Contains two tanks where highly-contaminated liquids were collected from research labs.
  - During operations, the liquid waste was pumped out and sent to the tank farms for further disposition.
  - A steel beam support structure will be attached to the vault for lifting and placement on transporter for shipment to ERDF.

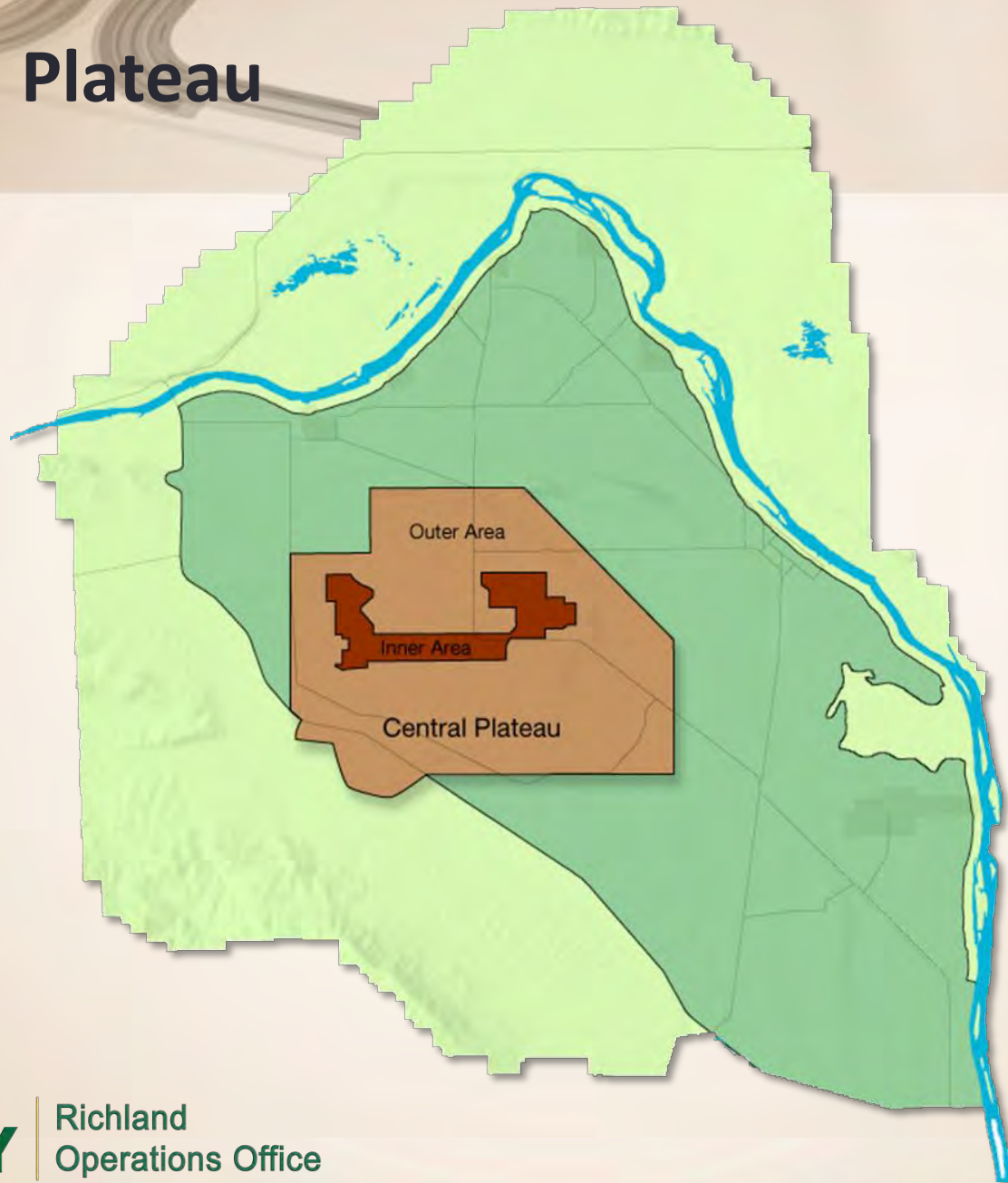
# 618-10 Burial Ground



- The 618-10 remediation continues
  - Over 97,000 tons of waste from trenches disposed at ERDF
  - Finding debris and drums deeper than expected
  - Over 400 drums removed 72 drums sent to PermaFix for processing.



# Central Plateau





# Groundwater Treatment



- Soil and Groundwater Project team honored with Secretarial Achievement Award for successful design, construction and startup of DOE's largest groundwater facility of its kind, 200 West Pump and Treat System
- Met overall groundwater treatment goal ahead of schedule, treating 1.2 billion gallons of contaminated groundwater in FY12 and exceeding Hanford's groundwater treatment goal by 20%
- Treated 200 million gallons of groundwater since September 2012



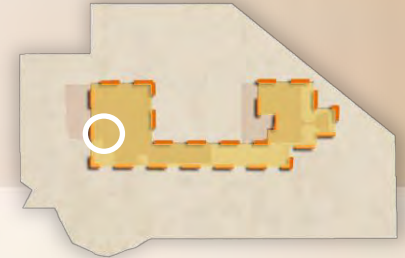
200 West Pump and Treat System



# 200 West Pump and Treat Preliminary Results

Contaminant		Radiological Building			Biological Building				Cleanup Level
		Influent Pre-Resin Tank 1	After Resin Tank 1	After Resin Tank 3	Influent Pre-FBR	After FBR	After MBR	Effluent	
Carbon Tetrachloride	(µg/L)	930	170	81	270	<1	<1	<1	3.4
Nitrate	(mg/L)	32.7	5.55	<0.038	11.4	<0.038	1.43	<0.038	10
Chromium	(µg/L)	80	4.94	<0.2	15.1	2.73	0.586	1.48	100
Hexavalent Chromium	(µg/L)	7.73	<2	<2	12.5	<2	<2	<2	48
Iodine-129	(pCi/L)	0.787	<0.2	<0.169	0.17	<0.232	<0.198	<0.221	1
Technetium-99	(pCi/L)	2210	<17	<17	51	<17	<17	<17	900
Trichloroethene	(µg/L)	<100	<100	<1	<100	<1	<1	<1	5
Tritium	(pCi/L)	28,000	31,000	28,000	18,000	17,000	12,000	13,000	20,000
Uranium	(µg/L)	2.18	<0.1	<0.1	0.868	0.274	0.2	0.254	30

# Central Plateau Inner Area: Plutonium Finishing Plant



- Reached 75 percent complete in glovebox removal, having removed 180 of 238 gloveboxes.
- Dispositioned glovebox HA-23S, one of the largest the team has worked with to date.



*HA-23S Glovebox weighs 10 tons and is multi story high*



# Central Plateau Inner Area: ERDF



- More than 14 million tons of contaminated material has been disposed in ERDF since 1996
- A treatment campaign of chromium contaminated soil from 100-C-7 waste site is complete



*Waste disposal at ERDF*

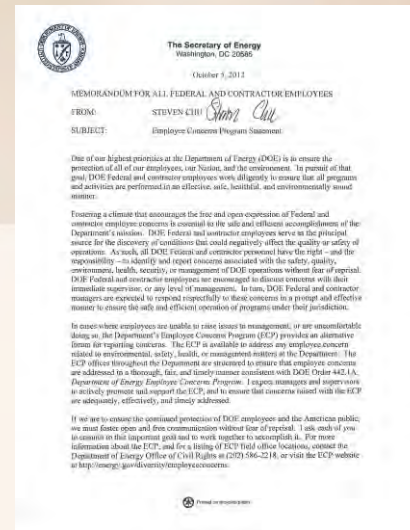


*Disposal of 309 Fuel Examination Cell at ERDF*



# Other News Across the Site

- Employee Concerns Program
- Site-wide Safety Culture Survey
  - 65% (6,532) Hanford employees participated
  - Each company is analyzing results and identifying improvements to implement
  - [www.hanford.gov/page.cfm/SpeakUpResults](http://www.hanford.gov/page.cfm/SpeakUpResults)



# Outreach: Tours, Speakers Bureau, & Hanford Story



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