

U.S. DEPARTMENT OF  
**ENERGY**

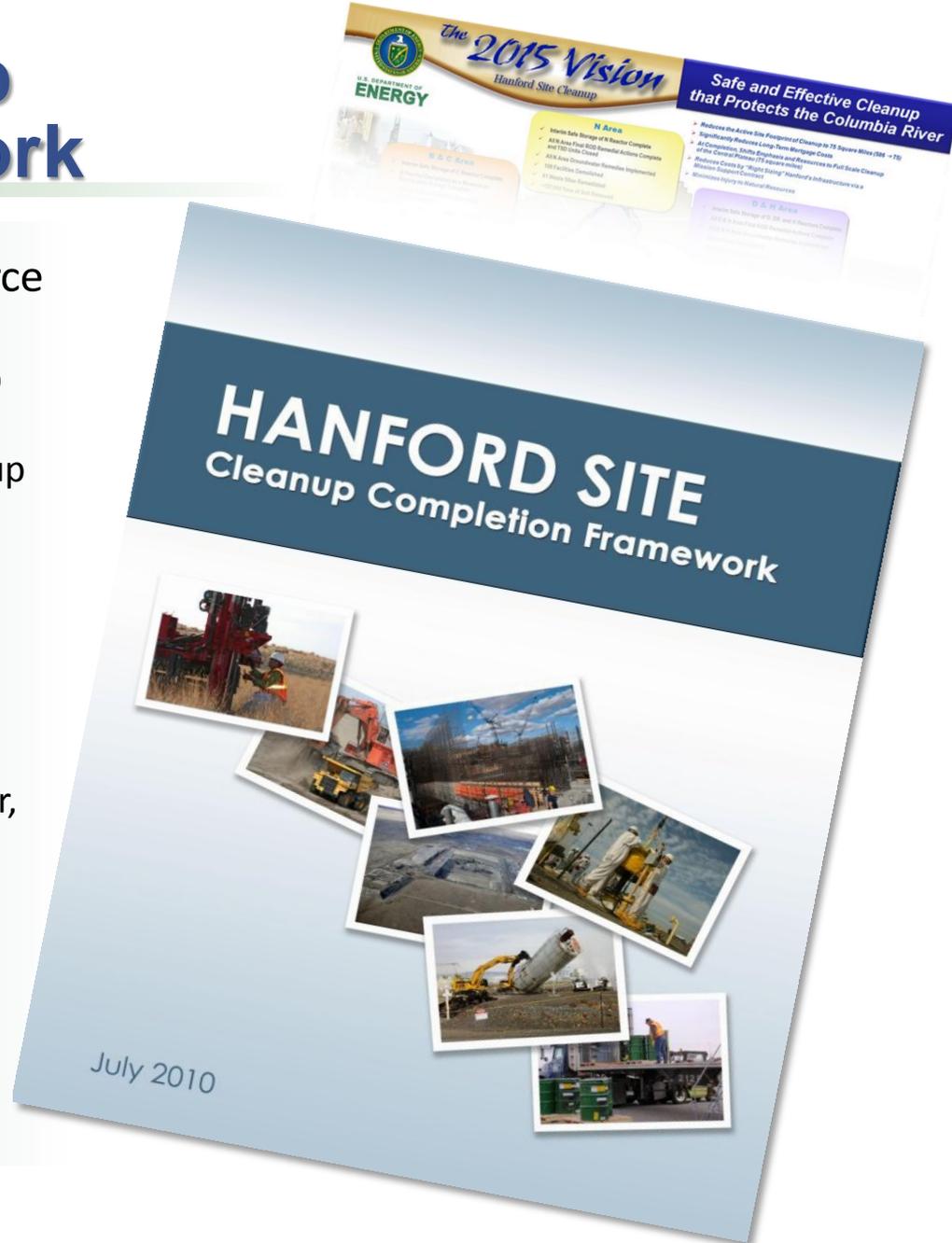
# HANFORD ADVISORY BOARD DOE-RL UPDATE

SEPTEMBER 8, 2011

*Matt McCormick*

# Hanford Site Cleanup Completion Framework

- Comprehensive Information Resource on Hanford Site Cleanup
  - Provides overview of Hanford cleanup strategy
  - Strives to make complexities of cleanup more understandable
  - Gives context for how individual activities support cleanup completion
- Content
  - Overarching goals for cleanup
  - Relationships between three main components of cleanup: River Corridor, Central Plateau and Tank Waste
  - Stages of cleanup completion building upon 2015 Vision, Central Plateau Strategy, new tank waste completion milestones
  - Cleanup challenges



# 2015 Vision

DOE vision is consistent with values of regulatory agencies, Tribal Nations, and stakeholders

- Complete River Corridor cleanup (220 sq. mi.)
- Demolish high-hazard Plutonium Finishing Plant
- Implement groundwater cleanup
  - Stop key contaminants from getting to the Columbia River
  - Contain and remediate key groundwater contaminants on Central Plateau



## Key Benefits

1. Reduces active cleanup footprint to less than 75 square miles by 2015
2. Reduces costs by "right-sizing" Hanford infrastructure
3. At completion, shifts emphasis and resources to full-scale cleanup of Central Plateau



# 22 Years of Cleanup

## *Continue momentum to reduce or eliminate environmental risks*

- Treated 5 billion gallons of contaminated groundwater, treatment in place along Columbia river and on Central Plateau; new treatment systems being deployed
  - 855 Million gallons in FY 11
- Cleaned up more than half of the total waste sites (568 of 1001) and demolished nearly half (265 of 522) of the facilities near Columbia River
  - 93 waste sites and 57 facilities in FY 11
- Sent 631 shipments of waste to national repository in New Mexico
- Disposed 6 of 10 reactors
  - 1 included in potential Manhattan Project National Historic Park
  - 3 reactors in process of interim safe storage or demolition
- Cleaned up 74 of 850 waste sites and demolished one-third (330 of 970) of the facilities on the Central Plateau
  - 39 waste sites and 59 facilities in FY 11
- Disposed more than 12 million tons of waste in Environmental Restoration Disposal Facility
  - 2 million tons in FY 11



# 2010 HAB Advice Overview

## Richland Operations Office

- Received 12 letters of advice, 9 pertaining to RL - appreciate the advice, value the discussions
- **HAB Advice #243: 200-SW-2, Radioactive Solid Waste Burial Grounds**
- **HAB advice #239 - Public Involvement Strategic Planning in the Community Relations Plan**
  - Proposed changes to TPA Community Relations Plan (CRP) incorporate many concepts and overarching principles from this advice
  - Several strategic approach suggestions from advice used in recent public meetings (200-SW-2, State of the Hanford Site and 200-PW-1/3/6 & CW-5)
  - Tri-Parties working on strategic planning tool to complement CRP
- **HAB Advice #241: Medical Support Contractor**
  - Provided useful, early input into process for developing draft Request for Proposals
- **HAB Advice #244: Cleanup Budget Priorities for Fiscal Year 2012, 2013 and Ensuing Years**
  - HAB participation in budget workshop and cleanup priorities identified in advice provided useful feedback for planning FY 2012 and FY 2013



# FY 11 Progress - Hanford Reach National Monument

- Completed cleanup of debris sites in the North Slope of the Hanford Reach National Monument, completing North Slope debris cleanup well ahead of the September 30, 2011 deadline
- 803 debris piles removed
- On schedule to complete 290 sq. mi. footprint reduction by September 2011



# FY11 Progress – River Corridor 300 Area

- Completed demolition of the 337 Technical Management Facility and 337-B High Bay Building
- Removed 309 Plutonium Recycle Test Reactor dome and started removing support walls
- Removed the 327 Post Irradiation Test Laboratory Lower SERF hot cell and Carousel and shipped to ERDF
- Completed deactivation of 320 Low Level Radiochemistry Building
- Completed shipment of 308 Plutonium Fabrication Pilot Plant gloveboxes & hoods to Perma-Fix for size reduction/packaging



# Remaining Challenge in the 300 Area

## 324 Building Soil Contamination

- Completed non-intrusive characterization of the new waste site (300-296) under B-Cell
- Collected soil samples below B-Cell awaiting lab analysis results



Equipment used to sample soil under 324



# FY11 Progress – River Corridor 618-10 & 11



**North Trench Excavation**



## 618-10

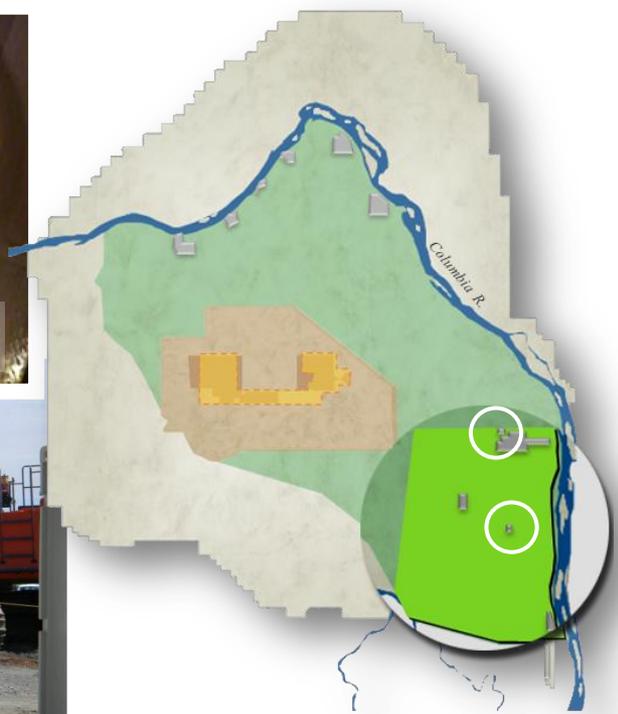
- Started excavation at 618-10 in April
- Excavated ~100,000 tons from waste trenches as of August 31
- Characterizing anomalies such as drums and bottles, implementing improved process for bottle disposition



**Aluminum Shaving Drum After Punching**

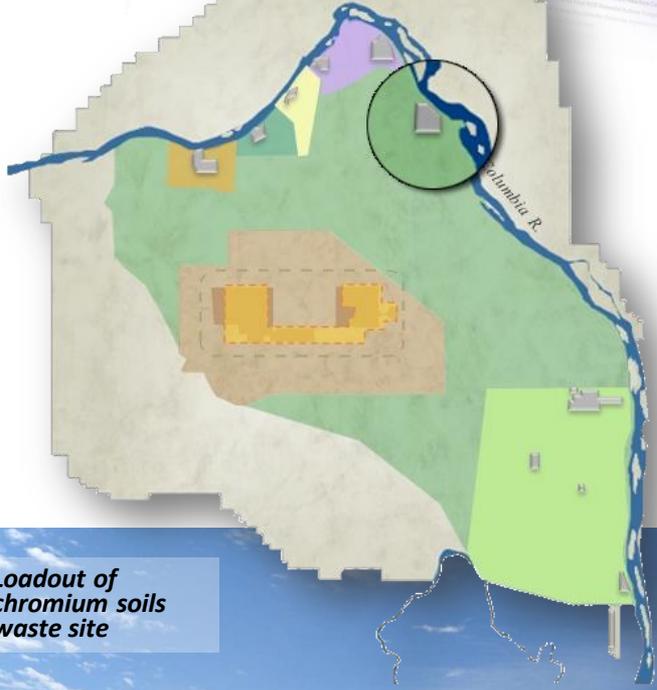
## 618-11

- Completed geophysics of caissons (5 caissons confirmed) and non-intrusive characterization of vertical pipe units
- Completed Vertical Pipe Unit removal technology development proof-of-concept testing
- Working with Energy Northwest to prepare License Amendment to allow remediation



**North Trench Concrete Drum**

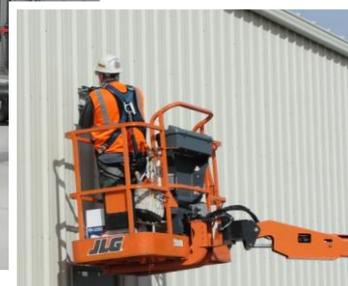
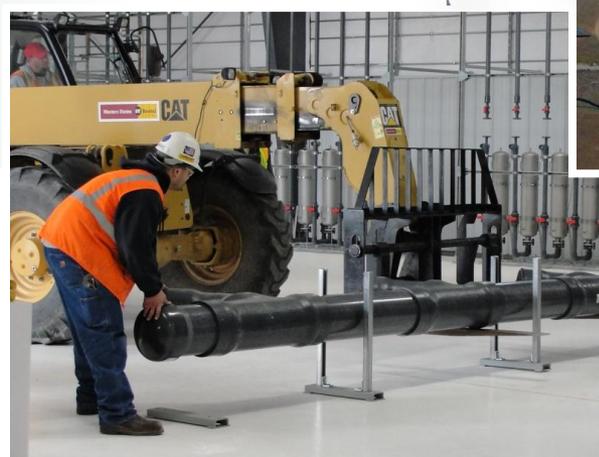
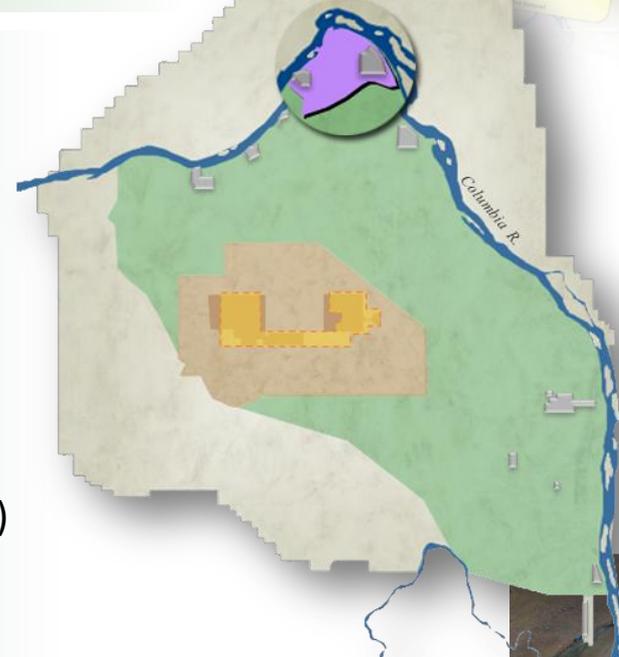
# FY11 Progress – River Corridor F Area



- Remediated 17 of 19 waste sites
- 137,473 tons of waste removed in FY 11
- Continuing removal of hexavalent chromium soils from 100-F-57 waste site

# FY 11 Progress – River Corridor D & H Area

- 43 waste sites remediated
- Initiated remediation of high priority chromium sites and found significant chromium source at 100-D-100
- 219,700 tons of waste removed in FY 11
- 100-DX Groundwater Treatment Facility**
  - Completed construction, began operations
  - Saved \$120,000 by using new and improved resin (requiring about 75 fewer resin changes)
  - Processed about 158 million gallons of water
- 100-HX Groundwater Treatment Facility**
  - Completing 100-HX system construction by September 30
  - Startup testing scheduled for October 1



Removing concrete debris and piping



Acid Trap from High Priority Chrome Site



# FY11 Progress – River Corridor N Area

- Completed ISS of 109-N Turbine Generator Building
- ISS of 105-N Reactor is over 90% complete and will complete Nov. 2011 – 10 months ahead of schedule.
- Completed Fuel Storage Basin above-grade demolition and started below-grade demolition
- Removed underground pipelines
- Removed sediment from inside river structures and started bench installation in the river to allow structure removal
- 518,300 tons of waste removed in FY 11

Prep for sediment removal



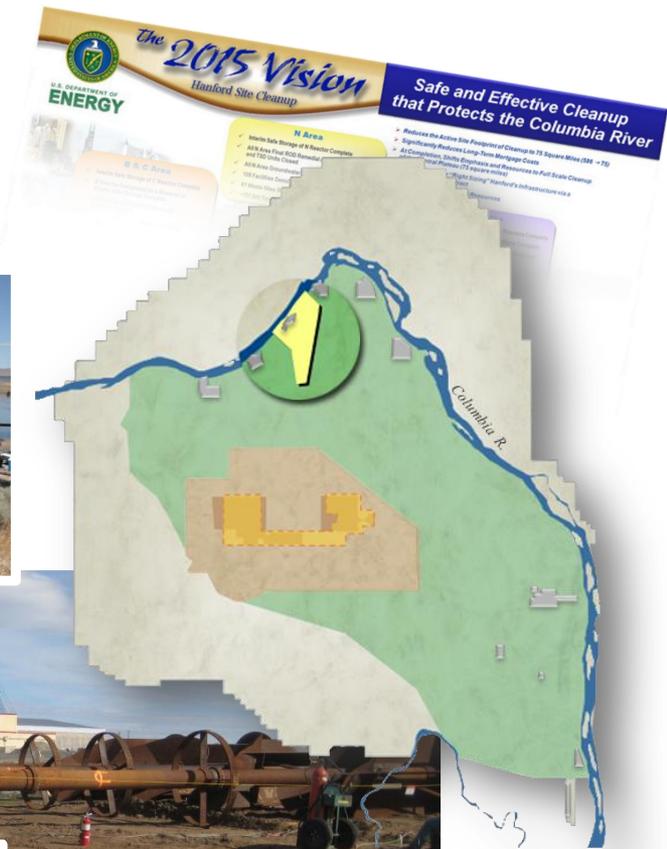
River Structure Pumps



Fuel Storage Basin Transfer Bay

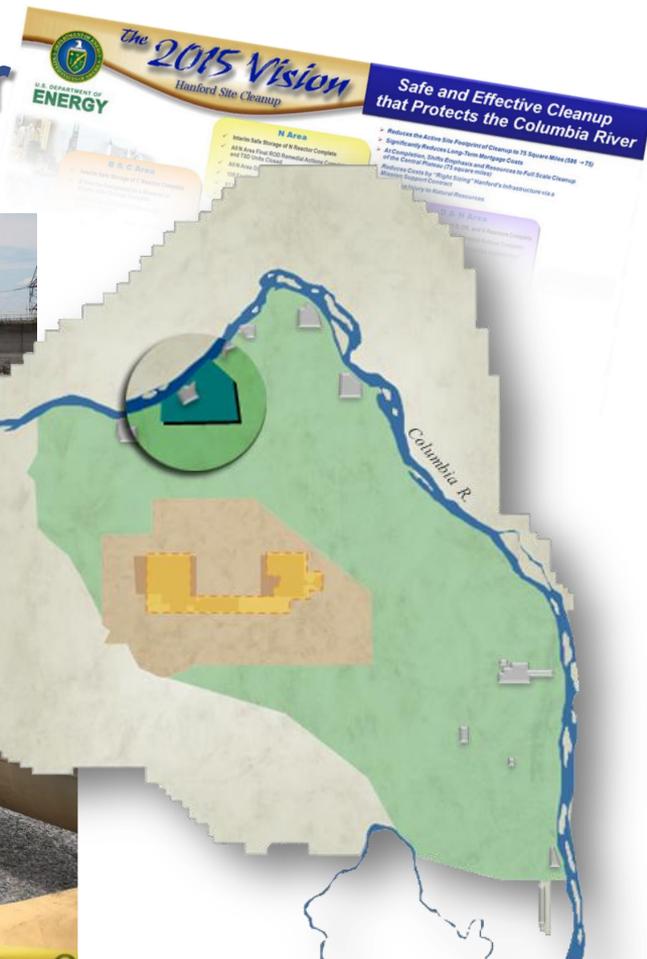


Safe storage activities at Fuel Storage Basin



# FY11 Progress – River Corridor K Area

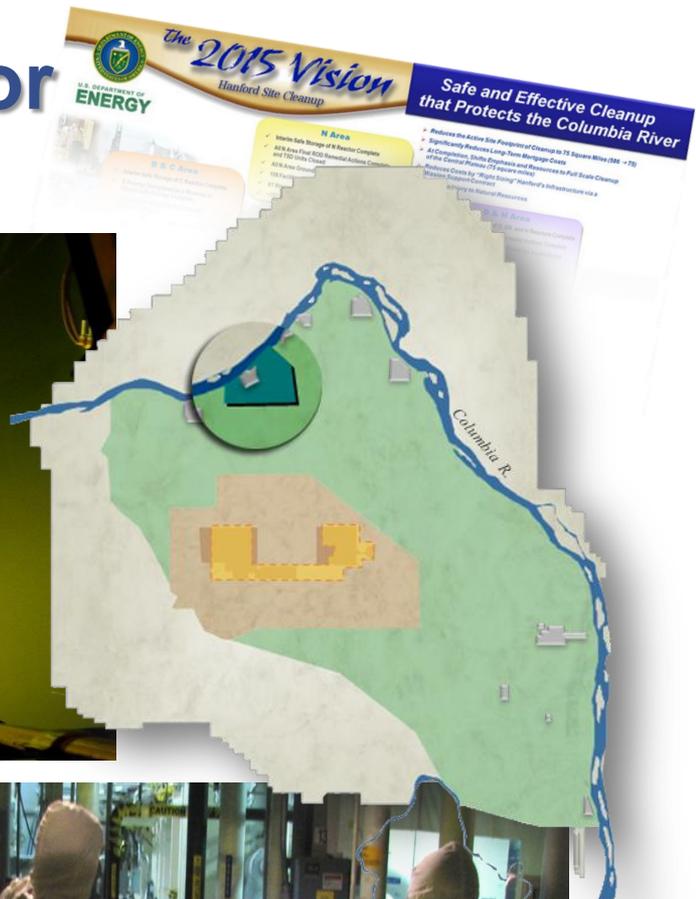
- Demolished 15 facilities with Recovery Act funding
- Completed demolition of the K West Sedimentation Basin
- Continued remediation of the 118-K-1 Burial Grounds and completed removal of 6 silos
- Concurrently demolishing:
  - Main pump house
  - K East and K West Clearwells
  - K East Filter Basins
  - K West River Pump House
  - K East River Pump House



# FY11 Progress – River Corridor K Area

## Sludge Treatment Project

- Took final samples of the radioactive sludge, transported samples to Pacific Northwest National Laboratory for analysis on January 4
- Completed K West Basin debris removal
- Completed Knock-Out Pot material pretreatment campaign
- Completed fuel-free verification of Basin areas on August 22
- Began demolition in August on 105 K West Annex to support modifications for sludge transport
- On target to remove sludge from the River Corridor by 2015



# FY11 Progress – River Corridor C Area

## Excavation 100-C-7:1



June 2011 Aerial

## 100-C-7

- Started remediation of 100-C-7 and C-7:1 chromium contaminated waste sites in January
  - Shipped over 210,000 tons of concrete to U Canyon for use as cap material
  - Remediated 100-C-7:1 to 45 feet with over 408,000 BCMs removed. Remediated 100-C-7 to 55 feet with over 209,000 BCMs removed.
  - Remediation expected to reach groundwater at both sites



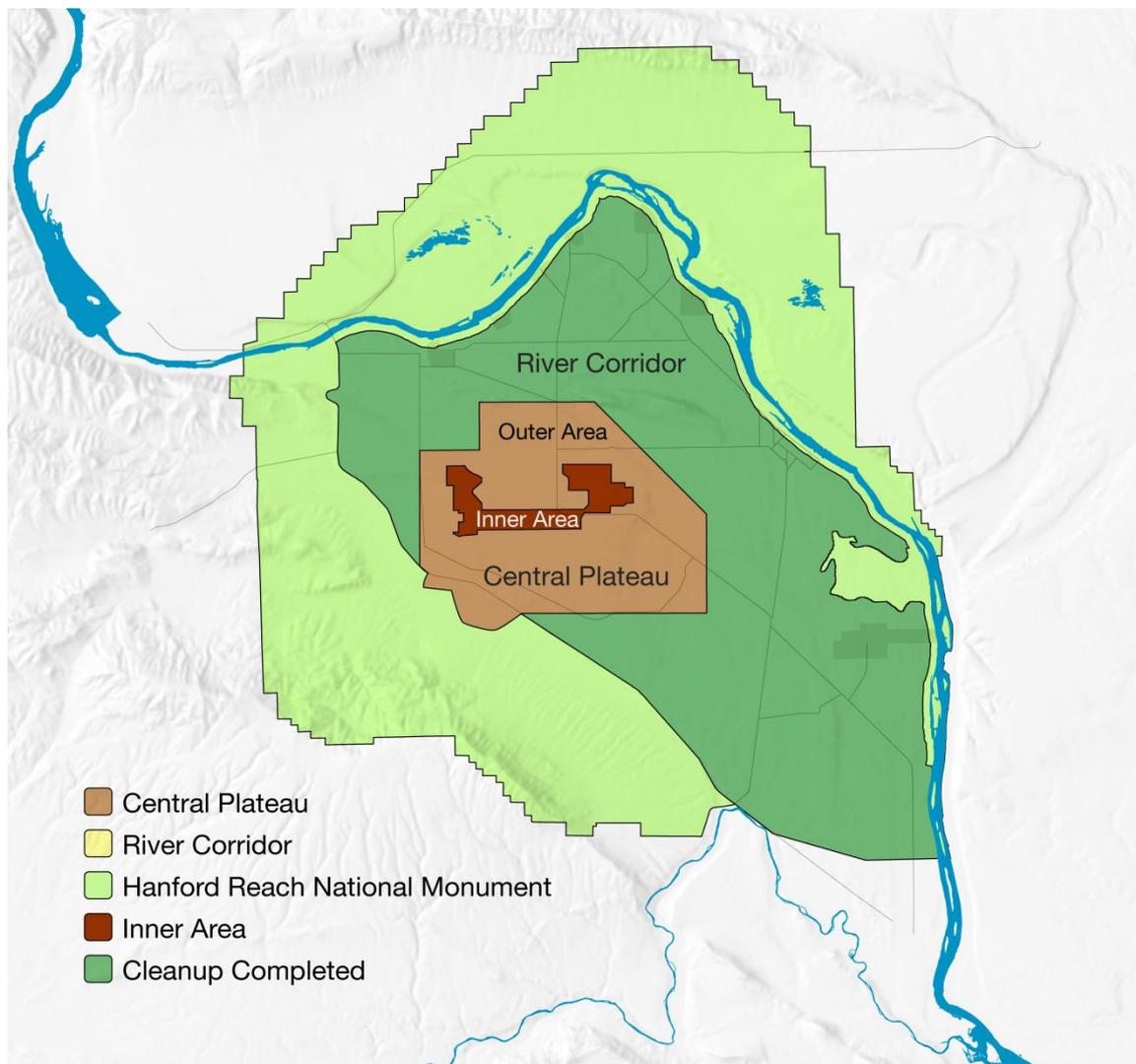
Cutting a Ramp – U-Canyon Loadout



# Stages of Hanford Cleanup



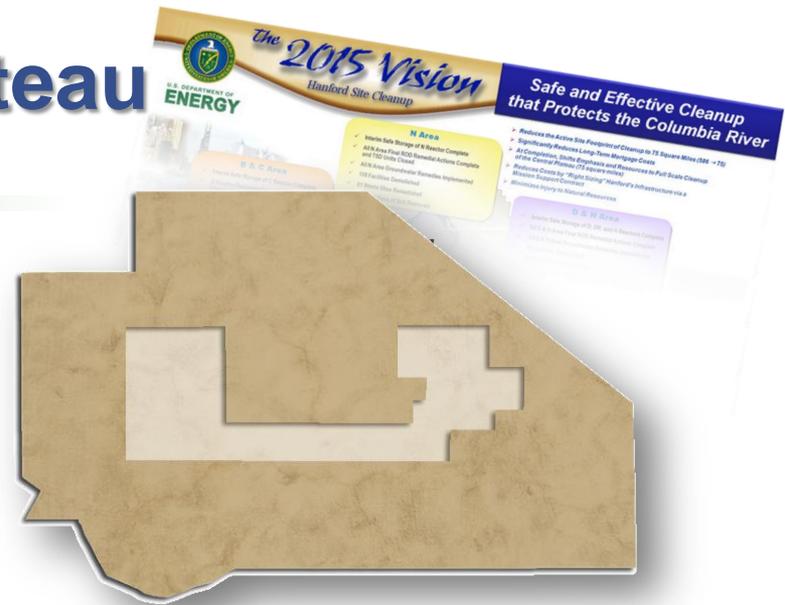
## Central Plateau: Outer & Inner Area



# FY11 Progress – Central Plateau Outer Area

## Outer Zone Soil Remediation

- Completed backfill, revegetation of 200 North Area waste sites
- Completed 36 outer zone waste sites with Recovery Act funding to date
- Currently taking public comment on NEPA Environmental Assessment proposed action to close Nonradioactive dangerous waste landfills/Solid waste landfills
- BC Control Area Remediation
  - 20,000 truckloads to ERDF
  - 480,000 + tons of contaminated soil
  - 140 acres cleared of contamination



BC Control Area - Before



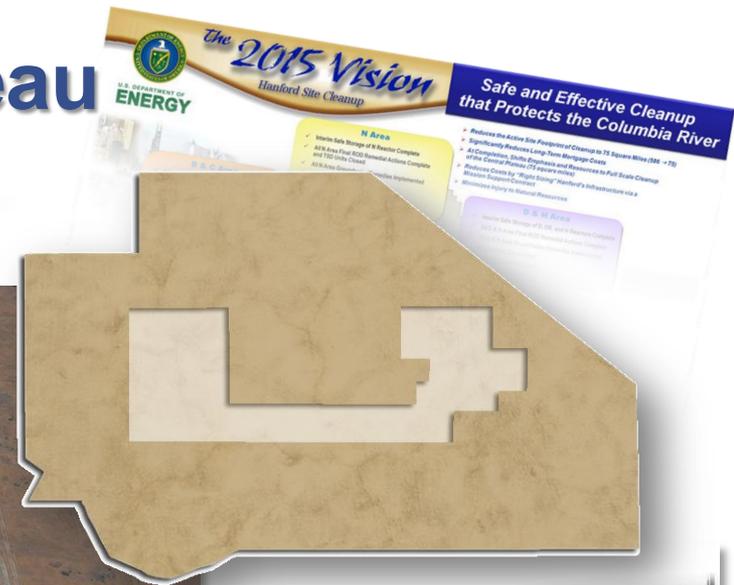
BC Control Area - After



# FY11 Progress – Central Plateau Outer Area

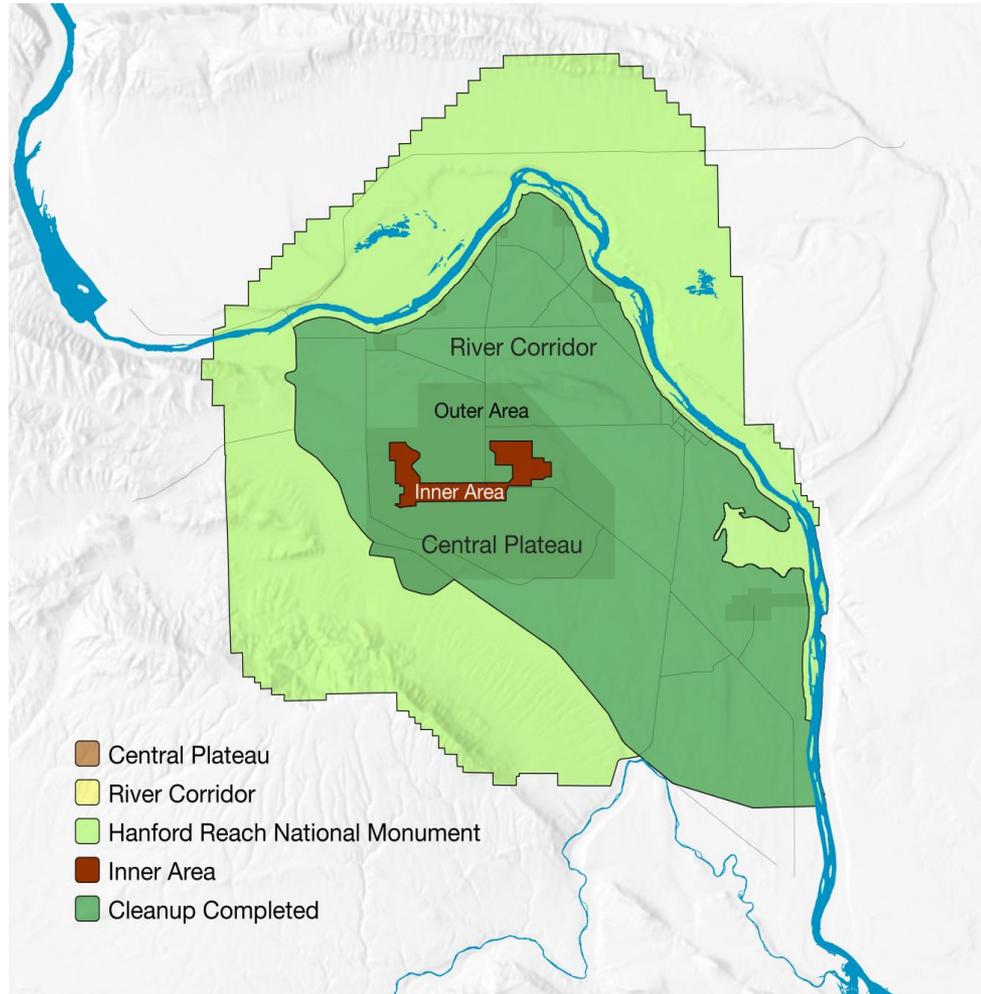
## Outer Area D&D

- Demolished 27 facilities with Recovery Act funding to date
- Removed 15 railcars from 212-N
- 4 relocated to B Reactor
- 11 disposed of at ERDF



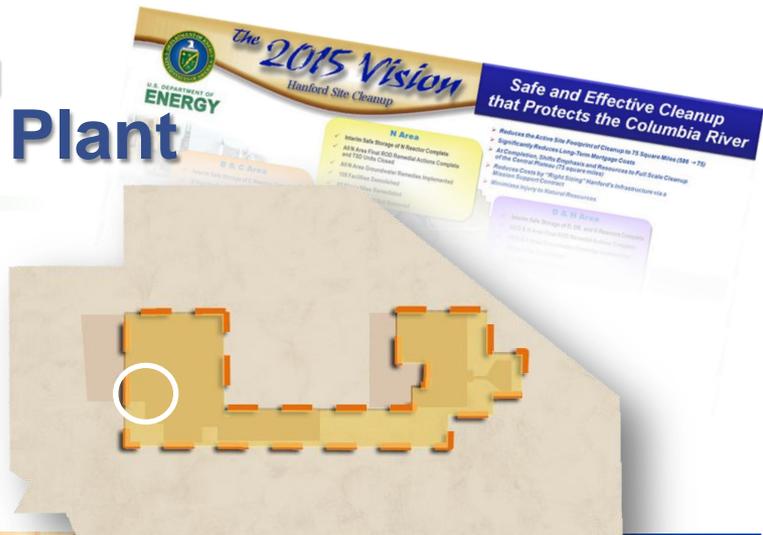
# Stages of Hanford Cleanup

Inner Area: <10 sq. mi; dedicated to long-term waste management and containment of residual contamination



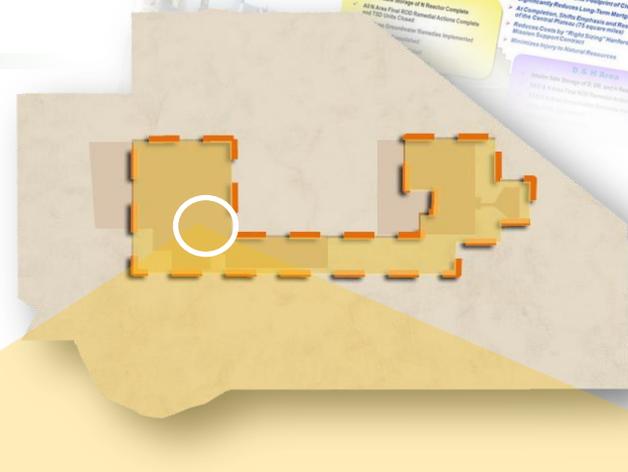
# FY11 Progress – Central Plateau Inner Area: Plutonium Finishing Plant

- 58 gloveboxes removed in FY 11
- Removed 158 gloveboxes (130 with Recovery Act funds) to date
- Completed removal of gloveboxes in laboratories
- Achieved “Cold and Dark” status for vault complex
- Removed 1,700+ feet of highly contaminated process vacuum system piping and process transfer line for disposal as transuranic waste to date
- Demolished 26 ancillary structures to date
- Removing 196 “pencil tanks” and other equipment from the Plutonium Reclamation Facility canyon; 15 complete



# FY11 Progress – Central Plateau Inner Area: U Canyon

- Completed core drilling to provide access to pour grout into process cells and void spaces
- Constructed, began operating grout batch plant
- Filled void spaces more than 50% with 20,318 cubic yards of grout
- Removed 7-foot-tall, 15,000-pound, radioactive Tank D-10 from Cell 30 to Central Waste Complex
- Hauled clean rubble from 183-KW site to U Canyon locale in preparation for the building's demolition



# FY11 Progress – Central Plateau Inner Area

## Demolishing Excess Facilities

- Demolished 22 facilities with Recovery Act funding to date
- Used explosives to lower four exhaust stacks, five baghouses, and two water towers
- Completed processing and loadout of debris from Power House demolition site
- Lowered 5 boilers and continued asbestos abatement at Power House
- Size reducing and removing 11 highly contaminated slab tanks from 209-E Criticality Mass Laboratory (nuclear facility)

## Waste Site Remediation

- Remediated 44 waste sites with Recovery Act funds
- Removed 231,565 tons of soil in FY11



# FY11 Progress – Central Plateau Groundwater

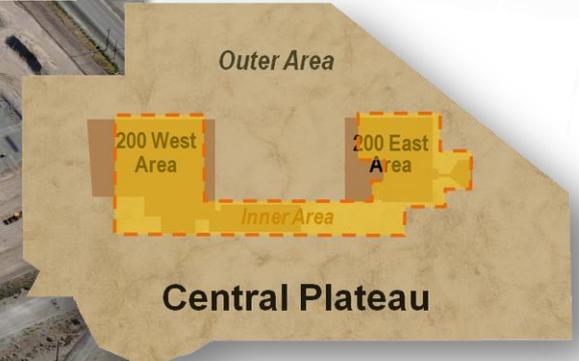


## 200 West Groundwater Treatment Facility

- Construction ~88% complete
- Construction Acceptance Testing (CAT) in progress for the facility's Radiological Building and Fluidized Bed Reactor in the Bio-Process Building
- Power supplied to Radiological Building

## Groundwater Treatment

- Ongoing treatment of Carbon Tetrachloride
- Soil vapor extraction
- T Farm pump and treat for technetium
- Drilled/installed 303 wells



# FY11 Progress – Central Plateau Inner Area: ERDF

## Environmental Restoration Disposal Facility (ERDF)

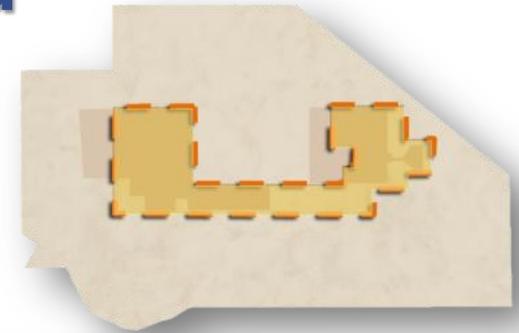
- Disposed of over 2,000,000 tons of waste in FY 2011. Over 12,000,000 tons disposed of since 1996.
- Increased average disposal rate from 200 canisters/day in 2009 to 500 canisters/day in FY 2011
- Completed construction of ERDF Super Cells 9 and 10 and placed in operation. Increased ERDF disposal capacity by 50% to 16.4M tons.
- Completed construction of new container and truck maintenance facilities



# Challenge on the Central Plateau Inner Area: Deep Vadose Zone

## DEEP VADOSE ZONE

- Announced Deep Vadose Zone Applied Field Research Initiative
- Completed soil desiccation test on June 30, 2011. Long-term monitoring in progress.
- Held stakeholder Technologies Information Exchange on DVZ remediation technologies
- Approximately 410 in situ instruments to monitor drying front – these instruments will continue to gather data for next five years
- Test data being evaluated and project team preparing test report
- Sensors in monitoring locations nearest injection well providing information on approaching desiccation front
- Project team now installing equipment for operation of the B-Farm Perch Water/Pore Water Extraction Project



# FY11 Progress – Infrastructure Reduction

## Mission Support Alliance (MSA) Role:

- Provide single integrated infrastructure and service for DOE-RL and DOE-ORP
- Modernize Hanford's infrastructure
- Drive innovation and cost savings

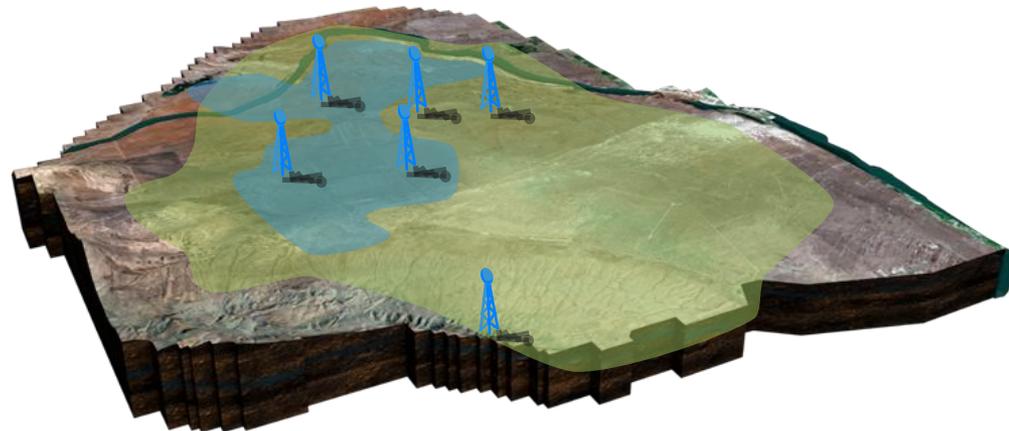
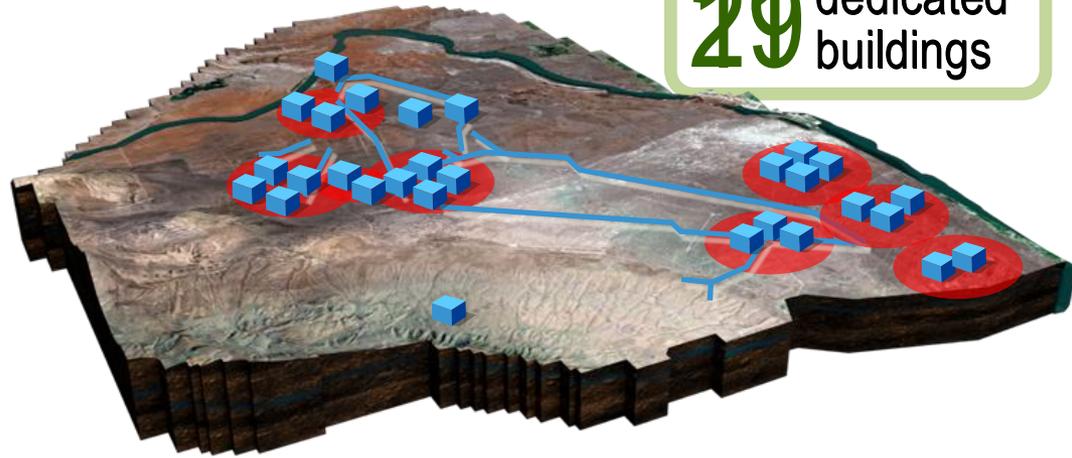
## Consolidating Services:

- Integrate site-wide input to determine current and future needs for site-wide services
- Consolidate and centralize services for site-wide efficiencies
- Partner with ORP to outline infrastructure future needs for Waste Treatment Plant

## Reducing the Footprint:

- Converged Information Technology (IT) infrastructure at Hanford – 2 communication networks (voice and data) to a single Voice Over Internet Protocol (VoIP) modernized network
- Expanded wireless by 400% for cleanup field work automation
- On target to achieve over 50% footprint reduction of infrastructure facilities

29 dedicated buildings



Actual Wireless Coverage (1359 sq. miles)



# FY11 Progress – Energy Efficiency

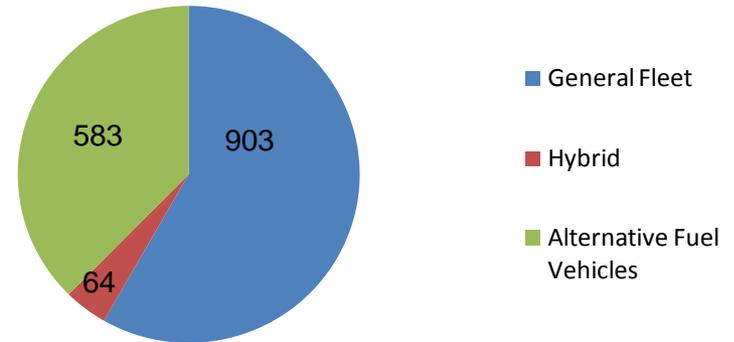
## Reduce Energy Consumption at the Hanford Site:

- Consolidate data centers, 50% energy reduction
- Migrate to Thin Client computer system – required 90% LESS energy than traditional desktop computer

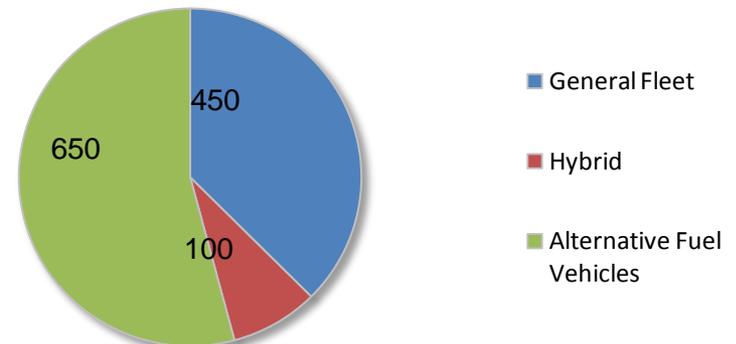
## Reduce Greenhouse Gas Emissions:

- Engage with site contractors to right-size vehicle fleet inventory
- Incorporate fuel efficient vehicles and alternative fuel vehicles into Hanford fleet
- Create infrastructure to support fully electric vehicles
- As vehicles are replaced, add new hybrid or alternative fuel vehicles
- Reduce overall fuel usage 25% by 2015

**2011 Hanford Vehicle Fleet**  
1550 Vehicles



**Forecast 2015 Hanford Vehicle Fleet**  
1200 Vehicles



# Getting the Word Out - *The Hanford Story*

- Overview chapter - April
  - ~9,000 views on YouTube
  - Nearly 3 million cable subscribers have viewing access
- Groundwater chapter – August
- Chapters in progress
  - ARRA
  - Future Uses
  - Tank Farms



# Outreach - Hanford Speakers Bureau



- 1,873 People in FY11
- 51 Presentations in FY11
- 325 People in FY10
- 12 Presentations in FY10

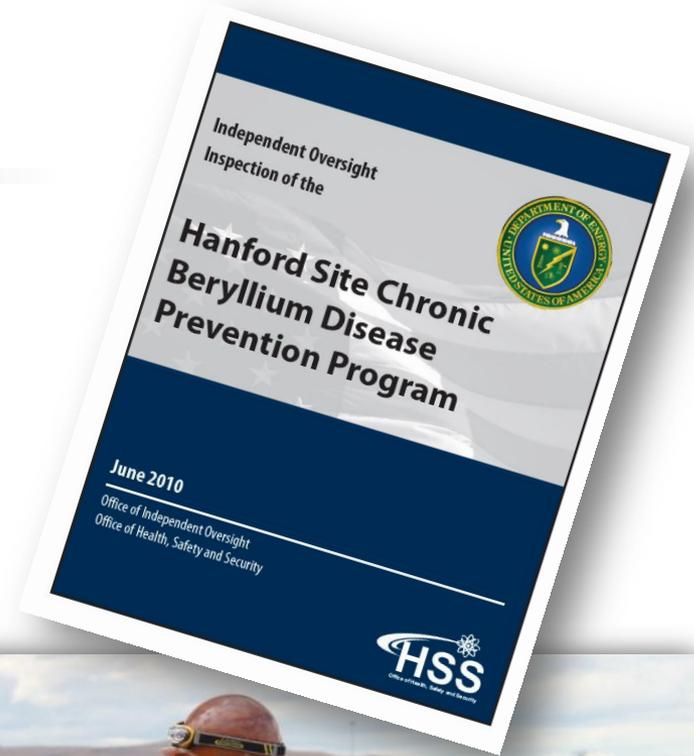


*Deputy Federal Project, Bryan Foley  
at Walla Walla Rotary Club*



# Focus on Safety

- BE Corrective Action Plan
- Site-wide Safety Standards
- FY12 Survey Assessments
  - Safety Conscious Work Environment
  - Will result in a Safety Action Plan
- Health Safety and Security Independent Assessment of Employee Concerns Programs



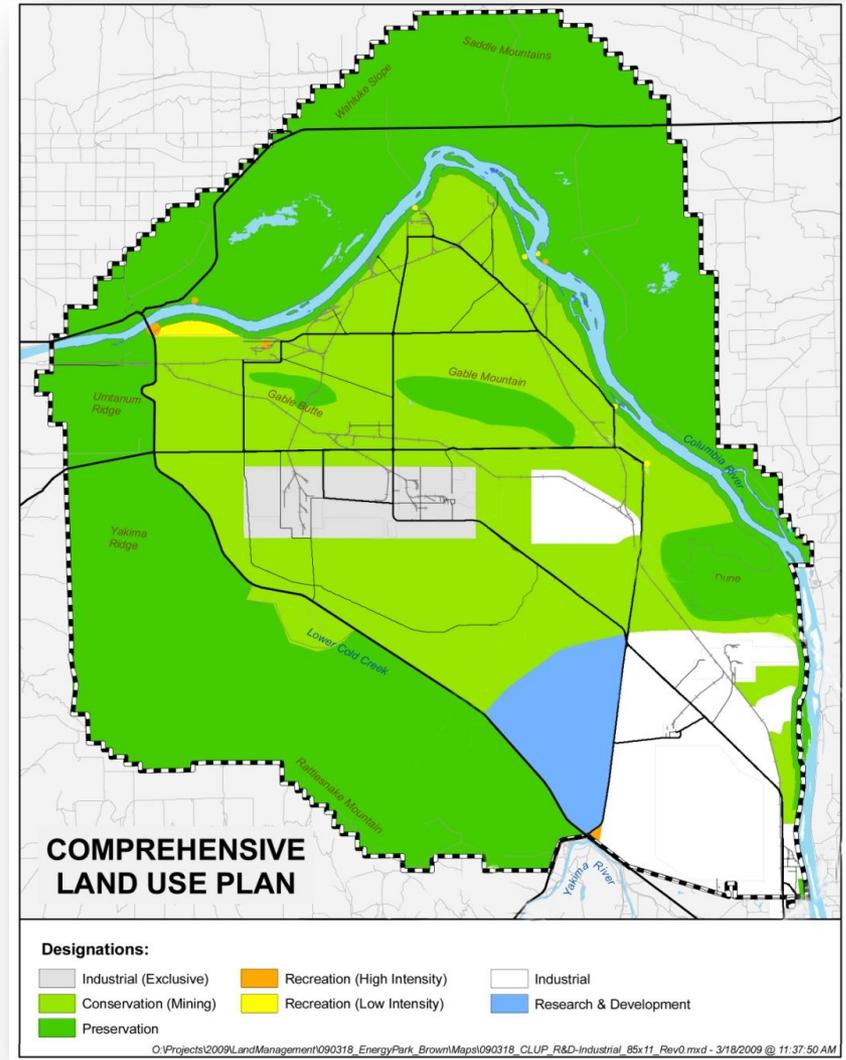
Safety planning at U Canyon



# Post-Cleanup Hanford

## Land Transfer considerations:

- Cleanup progress –cleanup footprint less than 75 square miles by 2015
- Responsibility to work with affected local communities as they transition away from economic dependency on Hanford
- Current administration direction to identify and eliminate excess properties to reduce economic burden on federal government
- DOE-RL received request from Tri-City Industrial Development Council (TRIDEC) to transfer 1,341 acres of land for economic reuse



# Post-Cleanup Hanford

## B Reactor

- Dept. of Interior recommendation to include B Reactor as part of Manhattan Project National Historic Park
- Chairman's Award for Achievement in Historic Preservation of the Advisory Council on Historic Preservation
- Improved visitor access
- 7,897 visitors, 221 tours in FY 11
- 18,915 visitors since March 2008
- Placed two historic locomotives and cask cars at B Reactor
- Recent Visitors: David Huizenga (EM-1), Dan Ashe (USFWS Director)



# Hanford Cleanup -- FY 2012 and Beyond

- In depth review completed by RL with HQ support to
  - Optimize cleanup dollars
  - Identify FY 2012 funding that could be applied to Plutonium Finishing Plant demolishing

Implementing results of the above review and the FY 2012 House mark of \$1.026 Billion supports RL 2015 Vision key components





# Continuing the Momentum and Building on our Shared Success

- Improved safety environment
- Alignment with regulators

## On track to complete major cleanup accomplishments:

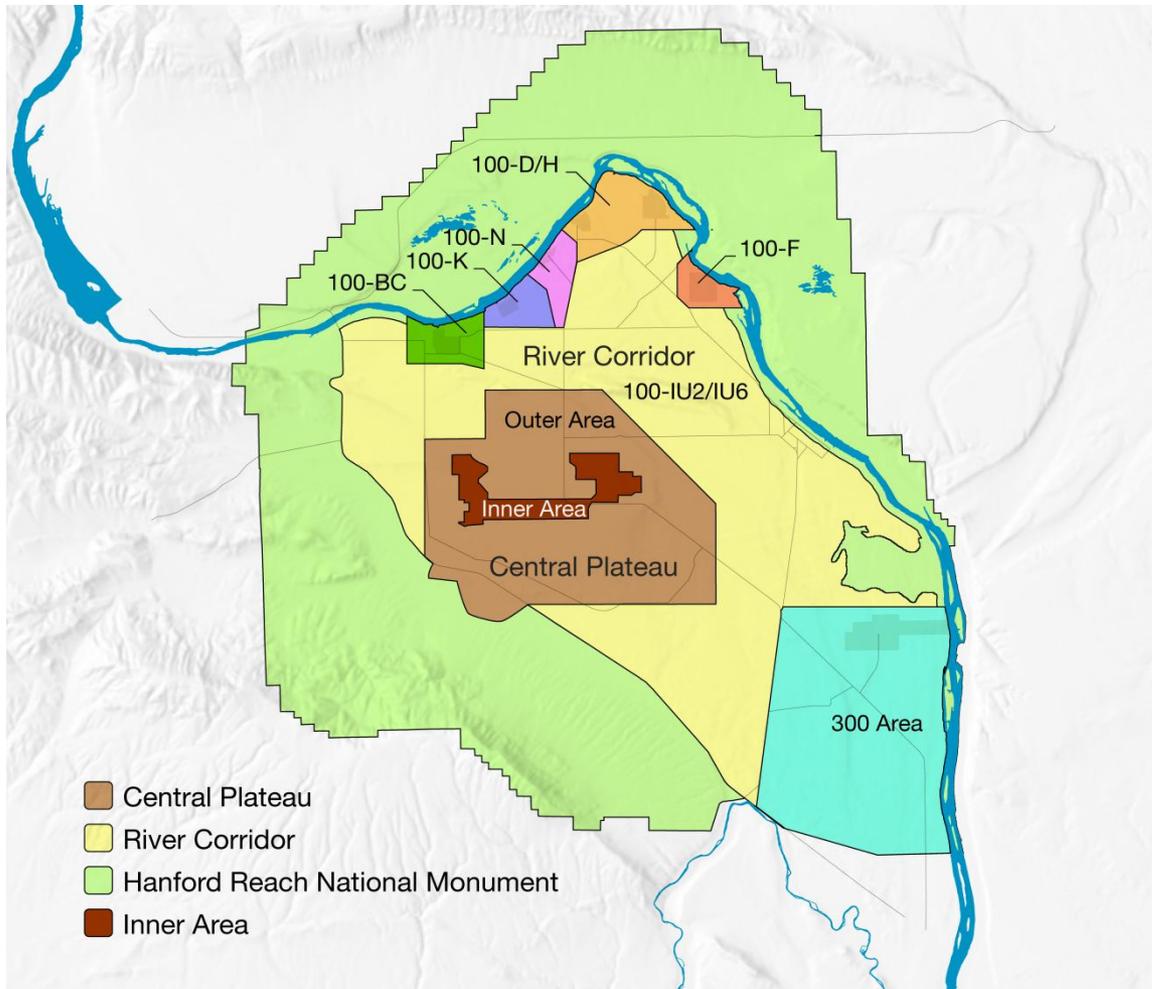
- Complete River Corridor Cleanup
- Demolish Plutonium  
Finishing Plant
- Implement remaining  
groundwater remedies

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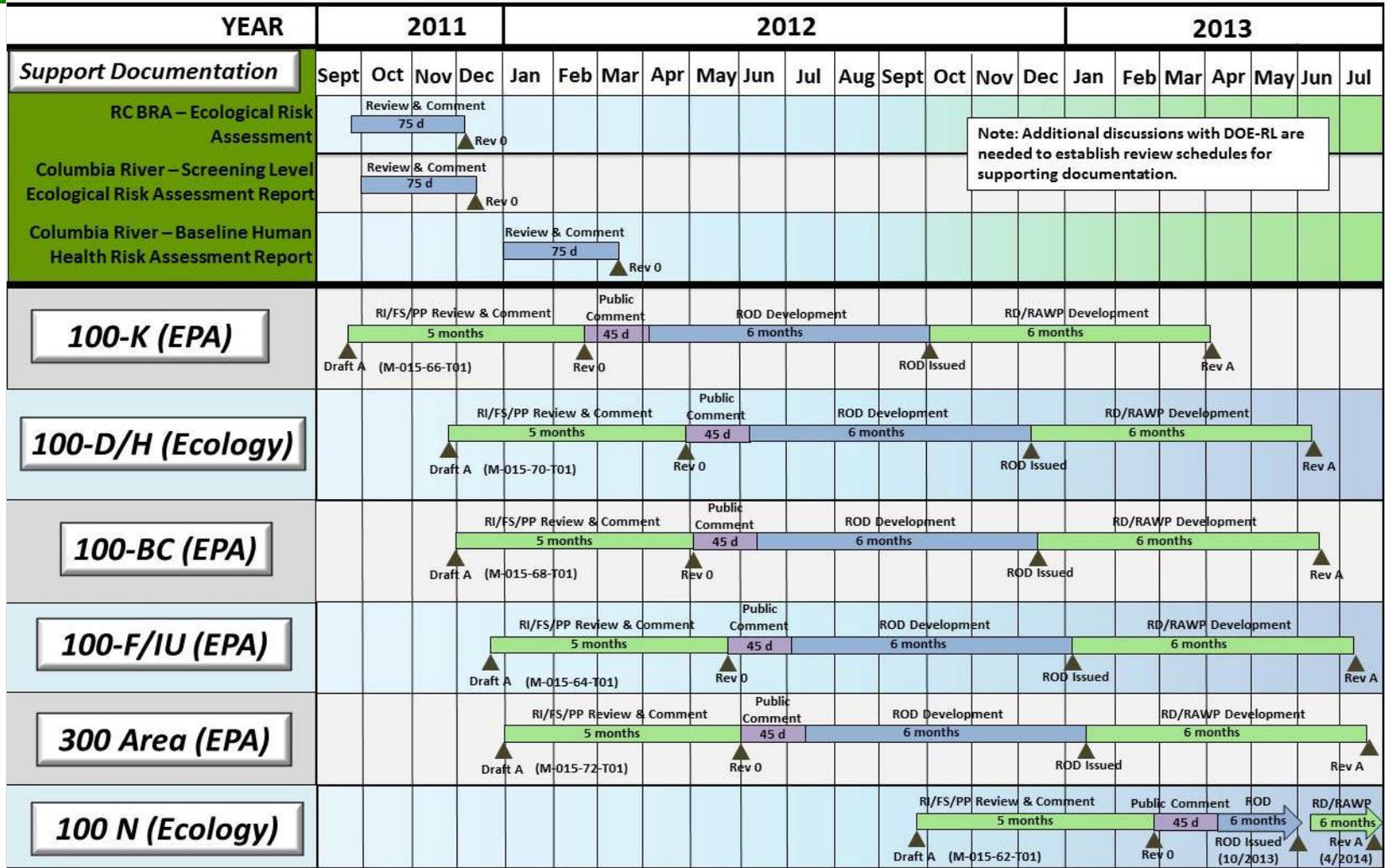
# BACKUP SLIDES



# River Corridor Decision Areas



# River Corridor Decision Documents



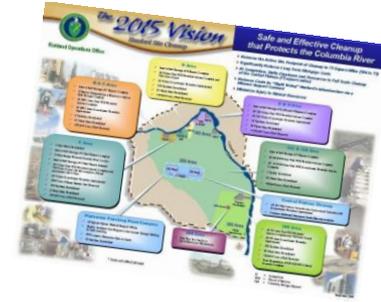
Note: Additional discussions with DOE-RL are needed to establish review schedules for supporting documentation.

Note: Schedules for the CERCLA documents are based on the most current versions of sections 7, 9 and 11 of the TPA.

**DRAFT**



# Key Cleanup Challenges for 2012 and Beyond



- Sustaining Funding to Maintain Cleanup Momentum
- Workforce Restructuring
- River Corridor
  - K West Basin Sludge
  - 324 Building
  - 618-10/11 Burial Grounds
  - Hexavalent Chromium at 100-D, 100-H and 100-K Areas
  - Strontium-90 Plume at 100-N Area
  - Uranium Plume at 300 Area
  - Final Disposition of Surplus Production Reactors
- Central Plateau
  - Sustaining Momentum for Plutonium Finishing Plant
  - Number, Variety, Complexity of Cleanup Actions
  - Deep Vadose Zone Contamination
  - Tank Waste Retrieval and Treatment
  - Tank Area Closure

