Cleanup Progress Update

Hanford Advisory Board

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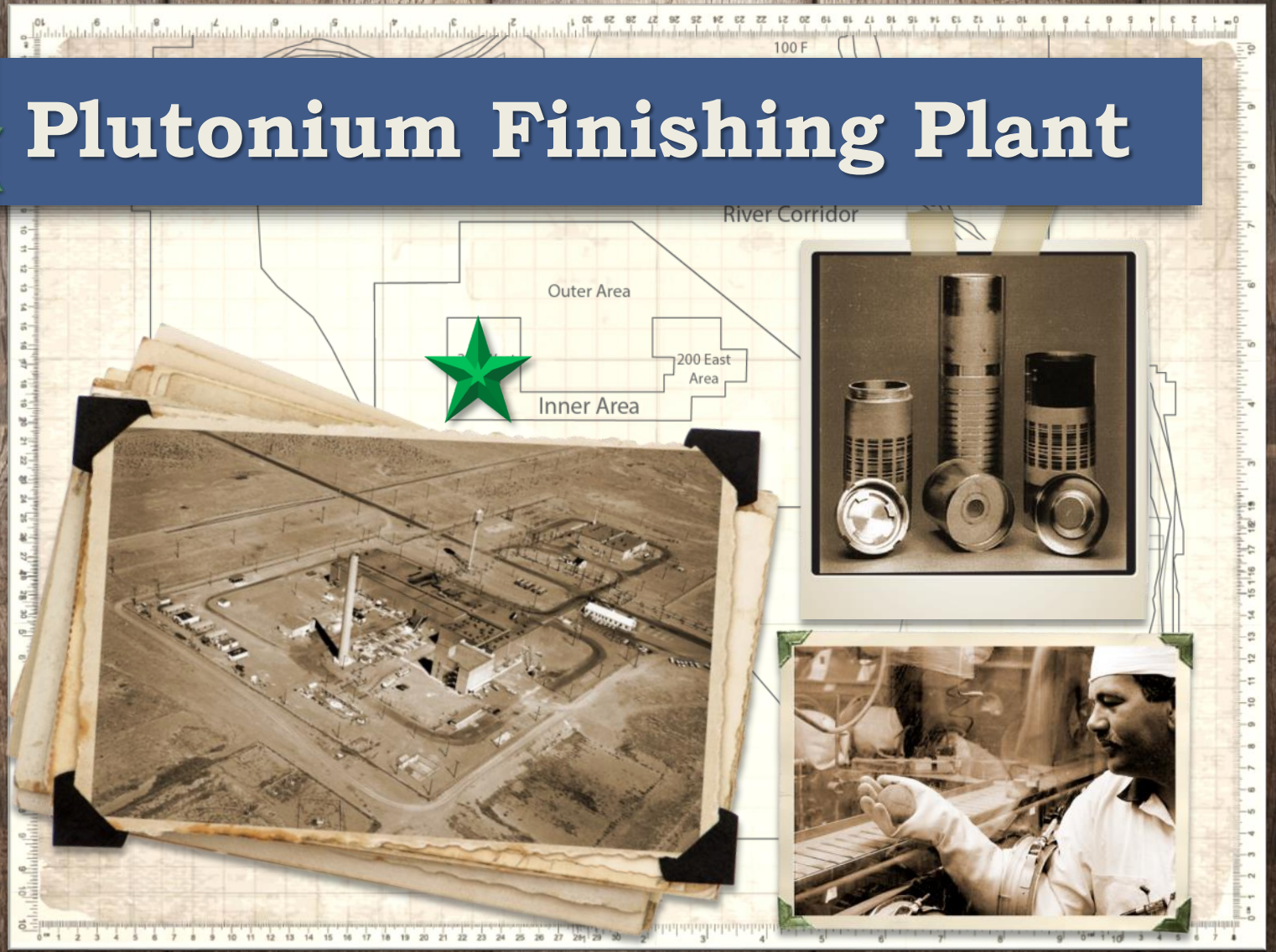
Department of Energy
Richland Operations Office

November 2014

A Look Back ...

Plutonium Finishing Plant



HAB Advice – PFP

"The Board urges DOE to complete PFP cleanup and stabilization. This will result in significantly reduced mortgage costs for DOE and greatly reduce risks."

FEBRUARY
1999

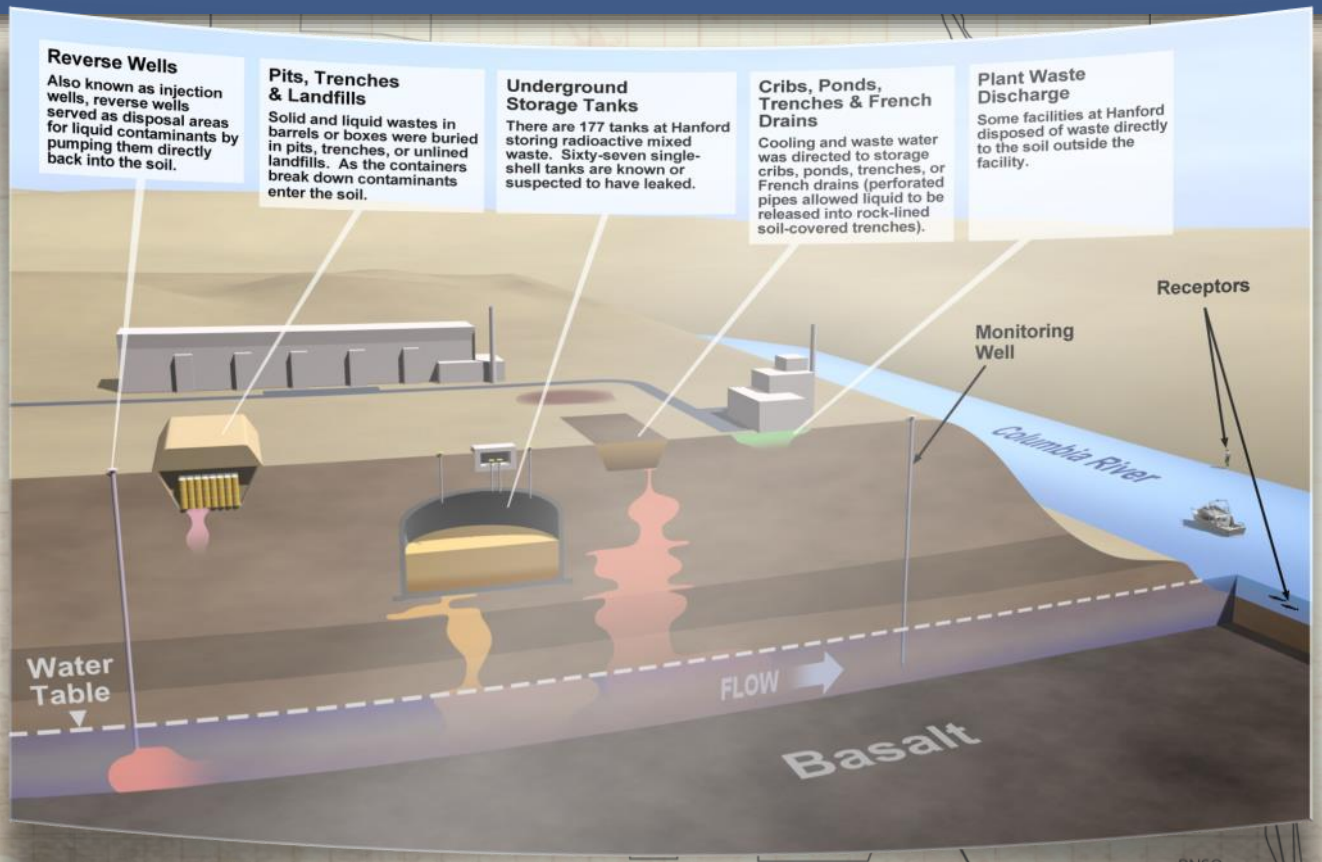
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28

Progress

63 of 81 buildings demolished

Removed 216 of 238 glove boxes; Removed 142 of 196 pencil tank units

Groundwater Remediation



HAB Advice – Groundwater Remediation

"The Board advises the Tri-Party Agencies to set specific goals and schedules for the characterization, remediation, and cleanup of all contaminated groundwater under the Hanford Site."

JUNE
2007

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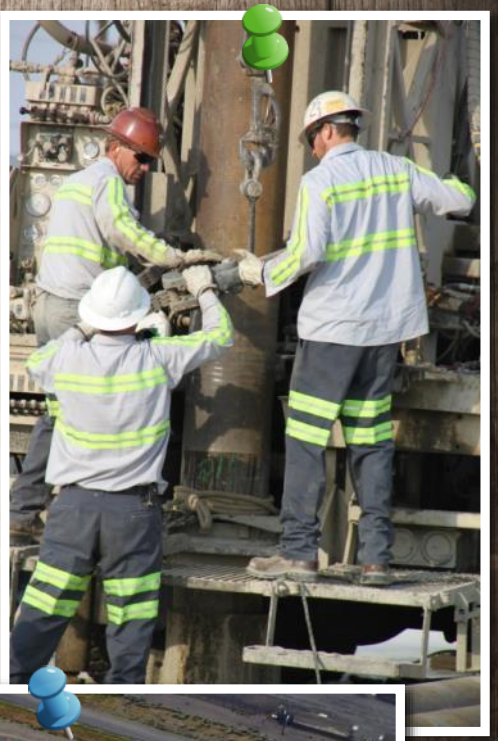
HANFORD ADVISORY BOARD 20 YRS

Progress



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Cocooning C-Reactor

HAB Advice – Cocooning C-Reactor

"The Board is supportive of the proposed approach to reducing the footprint of the facility and providing a much more secure, safe, and intrusion resistant facility having much lower surveillance and maintenance costs until final disposal occurs."

DECEMBER

1996

S	M	T	W	T	F	S
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Progress

C Reactor was the sixth of Hanford's nine reactors constructed. The reactor operated from 1952 through 1969.

In 1998, C Reactor became Hanford's first reactor to be placed in interim safe storage, a process known as "cocooning."

300 Area

River Corridor

Columbia River

Energy Northwest

PNSO Operation

HAB Advice – 300 Area

"The Board recommends DOE's approach to cleanup priorities in the 300 Area be based on risks to workers, the public and the environment with appropriate consideration to infrastructure and mortgage reduction issues."

FEBRUARY
2002

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Progress

1982

2014

Environmental Restoration Disposal Facility

1996

HAB Advice – Environmental Restoration Disposal Facility

July 7/8, 1994

There is a need for a disposal facility. The facility should be limited to waste from Hanford cleanup.

June 5, 2009

"The Board recognizes the critical role of ERDF for managing Hanford cleanup waste and supports ERDF expansion, so long as it can be done in a manner that is protective of human health and the environment in the long term."

JUNE

2009

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
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Progress – Expansion

A look at FY 2014

Richland Operations Office Cleanup Work

- Move buried waste, contaminated soil away from Columbia River
- Treat contaminated groundwater
- Deactivate and decommission facilities
- Isolate/contain contamination on Central Plateau
- Site landlord
- Approx. 4,300 of the 8,900 Hanford employees work for RL
  - River Corridor cleanup
  - Central Plateau remediation
  - Richland community & regulatory support

2014 Key Performance Goals

Making the 2015 Vision a Reality

Fiscal Year 2014 Key Performance Goals

HANFORD SITE

Complete all Tri-Party Agreement milestones on or ahead of schedule	AMRP
Perform oversight and take contract actions to proactively minimize the potential of a major occurrence that may negatively impact the public or environment	AMSE
Perform oversight and take contract actions to proactively minimize the potential of a significant accident, injury, or exposure	AMSE
Ensure the annual average Occupational Safety and Health Administration (OSHA) Total Recordable Case Rate is less than 1.1 and the annual average Days Away, Restricted, or Transferred (DART) rate is less than 0.6	AMSE
Implement 90 percent of the improvement actions in the RL Safety Culture Improvement Plan	AMSE
Evaluate the effectiveness of the Employee Concerns site wide process implementation and institutionalize improvements to the Differing Professional Opinion Process	DEP/ AMSE
Initiate implementation of beryllium corrective action plan products into the site's Chronic Beryllium Disease Prevention Program	AMSE
Finalize contract changes within 180 days of action[illegible] and ensur[illegible] approv[illegible] performance measu[illegible]ases to[illegible]aligned with the[illegible]act price	[illegible]B
[illegible]DOE [illegible]tua[illegible]d o[illegible]on [illegible]he Financial Statem[illegible]udit	[illegible]
Comp[illegible]0 percent o[illegible]iscal[illegible]k Plan Performance M[illegible]s by the appro[illegible]ue dates	A[illegible]S
[illegible]OE Hiring[illegible]m fill rate of 8[illegible]ays[illegible]ss	AMB
Comple[illegible]90 perce[illegible]view of the Ri[illegible]nd Int[illegible]anagement System (RIMS) descriptions, proces[illegible]procedu[illegible]rogram desc[illegible]ns and the service directory and complete necessary [illegible]	ALL
Conduct an annual "Min Safe" review	AMMS
Develop a plan to communicate the 2015 Vision and River Corridor cleanup accomplishments with employees, stakeholders, tribes and the public	OCE
Develop and initiate implementation of a phased plan for controlled, increased tribal use and public access to the River Corridor	DEP
Draft the Hanford Site Utilization and Management Plan for approval by EM and initiate discussions on the next-generation Hanford contracts	AMB

RIVER CORRIDOR

Complete remediation of 80 waste sites	AMRP
Complete cleanup of chromium contamination at the 100-D-30 and 100-D-104 waste sites	AMRP
Complete decontamination and demolition of the 11 remaining surplus facilities (except 324 and 100K)	AMRP
Complete demolition of the 326, 3730, 3760, 3790 and 183B facilities	AMRP
Oversee and approve the contract award for remediation of the 300-296 waste site under the 324 Facility	AMRP/ AMB
Complete removal/disposal of the 340 Vault	AMRP
Complete the removal/disposal of the Plutonium Recycling Test Reactor and complete above-grade demolition of the 309 Facility	AMRP
Complete cleanup of the 618-10 Burial Ground trenches	AMRP
Complete transition of reactors in interim safe storage (C, H, DR, D, N) to the RL Long Term Stewardship Program	AMMS
Complete a pilot study for the characterization of 5,000 acres of orchard lands	AMRP

CENTRAL PLATEAU

Complete removal of the remaining glove boxes associated with the PFP capital asset project	AMRP
Implement options to safely disposition PFP glove boxes, including foaming	AMSE/ AMRP
Disposition 25 PFP Pencil Tank Units	AMRP
Complete Effluent Treatment Facility (ETF) transition to campaign mode and develop a plan to transfer ETF to ORP by FY 2015	AMRP
Dispose of 1 million tons of waste at the Environmental Restoration Disposal Facility	AMRP
Complete the engineering design for the W[illegible] Encapsulation Storage Fa[illegible]y K3 ventilation system	AMRP

GROUNDWATER PROTECTION

Remediate [illegible]illion g[illegible]inat[illegible]our[illegible]er	AMRP
[illegible]d[illegible]o re[illegible]e 45,00[illegible]gra[illegible]f ni[illegible]	AMRP
Trea[illegible]undwa[illegible]o re[illegible]250 k[illegible]ms [illegible]rom	AMRP
Treat[illegible]ndwa[illegible]o re[illegible]gram[illegible]arbon tetrachloride	AMRP
Treat[illegible]ndwa[illegible]ren[illegible]1.1x10^{14} picocuries of technetium-99	AMRP
Install monitoring wells an[illegible]ifer tubes at 100-BC-5	AMRP
Obtain CERCLA Record of Decision for the 300 Area	AMRP
Submit Rev. 0 of the Remedial Investigation/Feasibility Study and the Proposed Plan for 100-F/IU 2 & 6	AMRP

RIGHTSIZE INFRASTRUCTURE

Analyze two areas for potential minimum safe efficiencies and possible small business prime subcontracting	AMB/ AMMS
Issue Request for Proposals for the 222-S Analytical Services Contract	AMMS /AMB
Develop a path forward regarding the Energy Northwest fire station and range use	AMMS
Complete the Hanford Fire Department baseline needs assessment and implement approved FY 2014 actions	AMMS
Identify FY 2014 Homeland Security Presidential Directive 12 (logical and physical access) RL/ORP actions and implement per approved schedule	AMMS
Complete improvement actions from DOE HSS security and emergency preparedness reviews per the approved schedule	AMMS
Replace 750 desktop computers site wide with Thin Client	AMMS
Issue the draft natural gas pipeline Environmental Impact Statement for public comment	AMMS
Issue the draft potential land conveyance Environmental Assessment for public comment and submit the draft 10 CFR 770 package to HQ	AMMS
Perform NEPA Supplement Analysis of the Hanford Comprehensive Land Use Plan Environmental Impact Statement	AMMS

U.S. DEPARTMENT OF ENERGY | Richland Operations Office

97% Complete

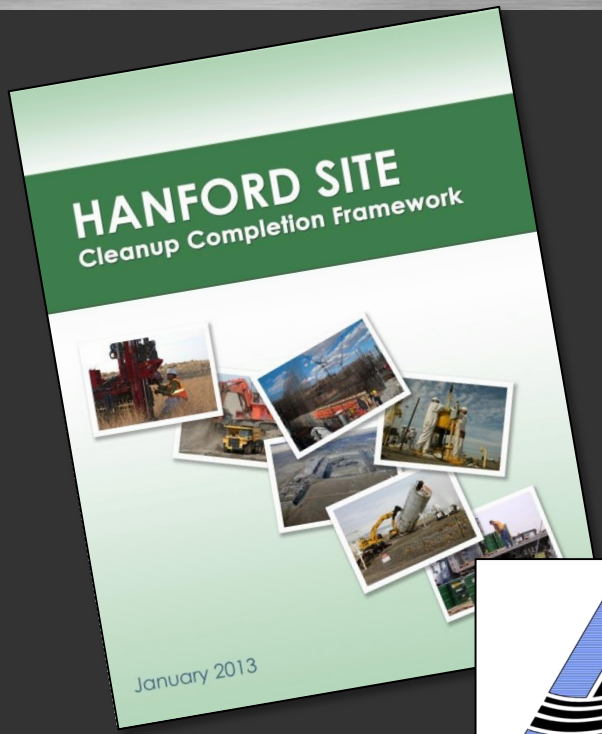
Richland Cleanup Priorities

- Maintain safe, secure and compliant activities, facilities and operations
- Continue Plutonium Finishing Plant deactivation, decommissioning and demolition
- Continue groundwater pump and treat operations, implement and optimize additional groundwater remedies
- Continue River Corridor cleanup, including remediation of 618-10 Burial Ground

Richland Cleanup Priorities

- Continue preparations for 324 waste site soil remediation (River Corridor)
- Move sludge from K-West Basin near the Columbia River to interim storage in the Central Plateau
- Move cesium, strontium capsules stored underwater in Waste Encapsulation Storage Facility into dry storage

Cleanup Strategies, Vision, Agreements



Tri-Party Agreement

U.S. Department of Energy
Washington State Department of Ecology
U.S. Environmental Protection Agency

Richland Prime Contracts

WCH Washington Closure Hanford	CH2MHILL Plateau Remediation Company	MSA
River Corridor Closure **RCC**	***Plateau Remediation Contract*** **PRC**	***Mission Support Contract*** **MSC**
Cleanup of 220 square miles along Columbia River: facility demolition, waste site remediation, operation of disposal facility	Facility and waste site cleanup, groundwater remediation, waste disposal	Cost-effective infrastructure and site services to support the cleanup mission
Awarded in 2005 Total Contract Value: $2.5 billion Cost-plus incentive-fee contract	Awarded in 2008 for 5 years, with 5 option years Total Contract Value: $5.7 billion Cost-plus award-fee contract	Awarded in 2008 for 5 years, with 5 option years Total Contract Value: $3.3 billion Cost-plus award-fee contract

HPM Corporation (HPMC) provides occupational medical services to DOE, Hanford contractors

- Awarded in 2012 for a two-year hybrid contract with four-one-year option periods that includes firm-fixed price with award fee, cost reimbursement, and Indefinite Delivery Indefinite Quantity (IDIQ) component
- Total Contract Value: $99 million

Safety and Health

Recent safety accomplishments:

Washington Closure Hanford received VPP Star status in 2009 and recertification in 2012; they have 4.5 million safe work hours

CH2M Hill Plateau Remediation Contract achieved VPP Star status and has reached 2 million safe work hours

Mission Support Alliance was awarded VPP Superior Star and VPP Star of Excellence

Richland Operations Office ($ in thousands)

PBS	PBS Title	FY 2014 Omnibus	FY 2015 President's Budget
RL-0011	NM Stabilization and Disposition - PFP	$142,670	$168,228
RL-0012	SNF Stabilization and Disposition	$98,369	$103,067
RL-0013	Solid Waste Stabilization and Disposition - 200 Area	$130,126	$112,371
RL-0030	Soil and Water Remediation - Groundwater/Vadose Zone	$141,500	$116,916
Subtotal	**Central Plateau Remediation**	**$512,665**	**$500,582**
RL-0041	Nuclear Facility D&D - River Corridor Closure Project	$337,642	$266,866
RL-0040	Nuclear Facility D&D - Remainder of Hanford	$70,992	$65,922
Subtotal	**River Corridor and Other Cleanup Operations**	**$408,634**	**$332,788**
RL-0100	Richland Community and Regulatory Support	$19,701	$14,701
RL-0020	Safeguards and Security	$69,078	$63,668
RL-0042	Nuclear Facility D&D - Fast Flux Test Facility Project	$2,542	$2,562
Total - RL	**Richland Field Office Funding Summary**	**$1,012,620**	**$914,301**

Cleanup Progress
618-10 Burial Ground

618-10 Burial Ground – one of Hanford's most hazardous burial grounds

Waste trench remediation

VPU remediation mockups/testing

Cleanup Progress – 300 Area

Massive Lifts!

Plutonium Recycle Test Reactor – 1,082 tons

340 Vault – 1,153 tons

309 underground demolition

Cleanup Progress – 324 Building

Cleanup Progress – N Reactor Area

Cleanup Progress – 100-C-7 waste site

Backfill and revegetation of waste site 100-C-7

New techniques result in a better natural habitat

K Basin Sludge Project

Nearing completion of construction of the K Basin Annex

Groundwater Remediation

Across the site, 2 billion gallons of groundwater treated and 62 tons of contaminants removed in FY14

Cleanup Progress
Plutonium Finishing Plant

Workers recently entered the highly hazardous McCluskey Room

Recently, crews completed demolition of eight support facilities

Public Outreach/Involvement Activities

- Current Tour Programs
  - Held 40 public tours – 1,985 visitors
  - B Reactor National Historic Landmark tours – 10,000 visitors per year
- New Tours in 2015
  - Tours of facilities in the historic pre-Manhattan Project town sites of Hanford and White Bluffs
- Speakers Bureau
  - 10 engagements, 600 attendees

HAB RL Advice 2014

- 100-F – RI/FS and Proposed Plan
- 100-D/H RI/FS
- 2015 President's Budget and 2016 Budget Request
- 2014 Lifecycle Scope, Schedule and Cost Report
- 100-N Proposed Plan, Draft A

HAB Work Plan 2015

- Deferred Maintenance (Critical Safety Systems)
- Area Management Plan
- 100-D/H RI/FS
- Next RL Vision
- Budget/Continuing Resolution Updates
- Employee Concerns Program
- Effectiveness of the Beryllium Program
- Central Plateau RI/FS Work Plans (3 total – SW-2/WA-1/DV-1)
- 618-10 VPU Methods Testing Update
- Progress on 242-Z facility at PFP (McCluskey Room)
- Progress on 324 waste site remediation mockup and design
- PFP (what's happening in 2015)
- Status on 300 Area ROD implementation
- Status of Cesium/Strontium Storage
- 200 Area Groundwater Treatment Update
- Status of River Corridor (overall)

Richland Operations Office Cleanup Work Scope

Complete any Remaining 2015 Vision Projects

1. Complete demolition of PFP to "Slab on Grade"
2. Complete transfer of the K West Basin sludge to the Central Plateau

Complete any Remaining River Corridor Cleanup

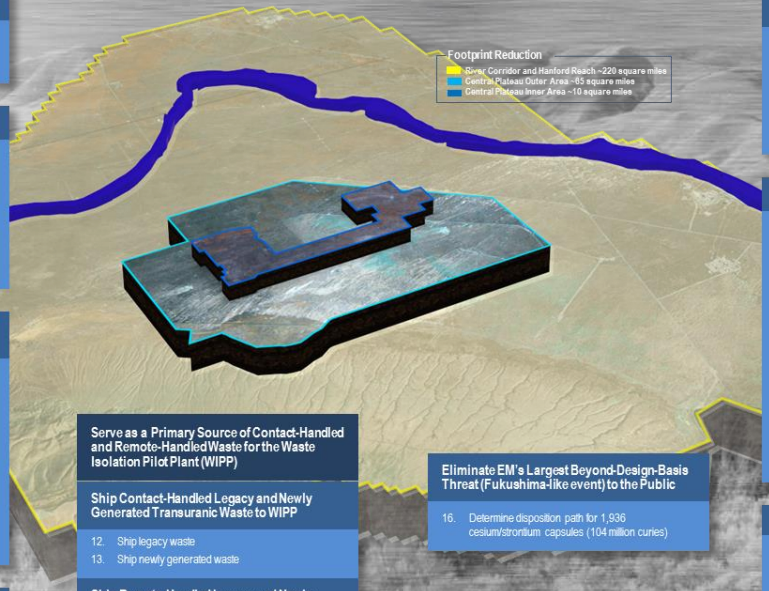
3. Complete the 324 Building and 618-11 Burial Ground
4. Conduct any additional soil remediation required by the CERCLA Records of Decision
5. Demolish the K West Basin and demolish/remediate remaining K-Area facilities and waste sites
6. Place the last two plutonium production reactors (K East and K West) into interim safe storage

Continue Groundwater Cleanup and Reduce Key Long-term Groundwater Threats

7. Contain key contaminants and treat over 1 billion gallons of contaminated groundwater each year
8. Implement additional groundwater remedies required by the River Corridor CERCLA Records of Decision (expand Cr+6, 100 N apatite barrier and 300 Area Phase I in situ treatment)
9. Implement 200 East groundwater remedies (BP-5/PO-1)
10. Complete data acquisition and treatability testing to determine feasibility of remediating the Deep Vadose Zone, contaminated by past discharge of more than 450 billion gallons of contaminated liquids directly to the soil

Provide Essential Infrastructure for Cleanup

11. Establish necessary infrastructure to support Waste Treatment Plant operations and Central Plateau cleanup



Serve as a Primary Source of Contact-Handled and Remote-Handled Waste for the Waste Isolation Pilot Plant (WIPP)

Ship Contact-Handled Legacy and Newly Generated Transuranic Waste to WIPP

12. Ship legacy waste
13. Ship newly generated waste

Ship Remote-Handled Legacy and Newly Generated Transuranic Waste to WIPP

14. Treat and ship K-Basins sludge
15. Retrieve, pretreat and ship transuranic waste stored in Alpha Caissons

Eliminate EM's Largest Beyond-Design-Basis Threat (Fukushima-like event) to the Public

16. Determine disposition path for 1,936 cesium/strontium capsules (104 million curies)

Reduce Security Costs by More than $20 Million Per Year

17. Ship category I irradiated fuel offsite (approximately 20 shipments)

Clean up the Central Plateau Outer Area and Shrink the Cleanup Footprint of the Hanford Site to Less than 10 Square Miles (98 percent reduction)

18. Complete RI/FS and obtain Record of Decision for outer area operable units
19. Remediate over 120 waste sites
20. Close the Non-Radioactive Dangerous Waste Landfill/Solid Waste Landfill by placing a barrier over the top
21. Complete small TSD closures

Clean Up Central Plateau Inner Area Waste Sites

22. Clean up 21 waste sites (PW 1, 3, 6 and CW5) contaminated with plutonium and cesium in the Central Plateau Inner Area
23. Complete RI/FS and obtain Records of Decision for inner area waste site operable units in the following priority
    - 200 West Inner Area and BC cribs and trenches
    - 200 East Inner Area and pipelines
    - 200 Area Deep Vadose Zone
    - 200 Area Burial Grounds
24. Complete Cleanup of the Inner Area per the CERCLA RODs
    - 200 West Inner Area & BC Cribs & Trenches
    - 200 East Inner Area & Pipelines
    - 200 Area Deep Vadose Zone
    - 200 Area Burial Grounds

Clean Up Central Plateau Inner Area Large Processing Canyons

25. Begin demolition of U Plant, clean up waste sites, design protective barrier and install Barrier
26. Complete RI/FS and obtain Records of Decision for Remaining Canyons (B Plant, PUREX, REDOX)
27. Complete Cleanup of Canyons (B Plant, PUREX, REDOX) per the CERCLA RODs

28. Demolish the Fast Flux Test Facility

Base Operations Needed to Support Cleanup

Operate key waste management facilities and maintain minimum safe operations and essential site services

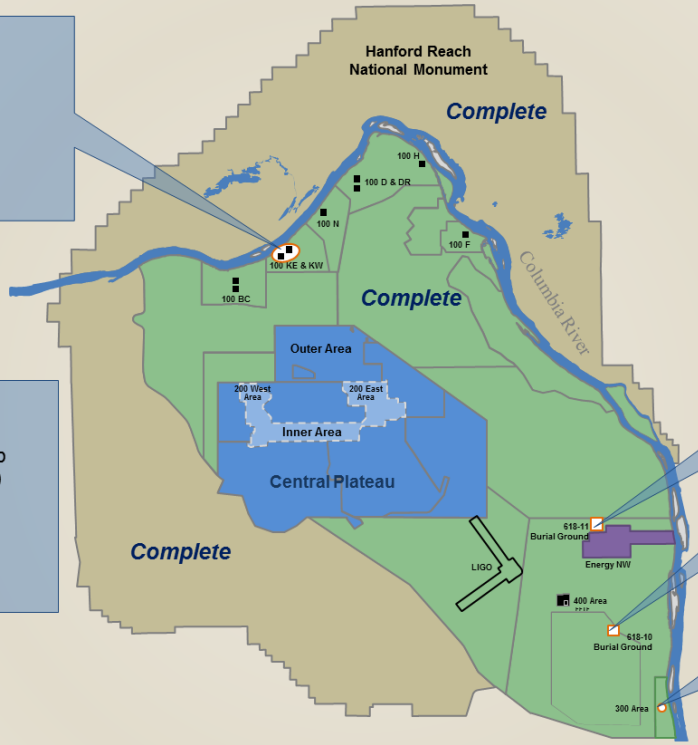
October 28, 2014

Today on the River Corridor

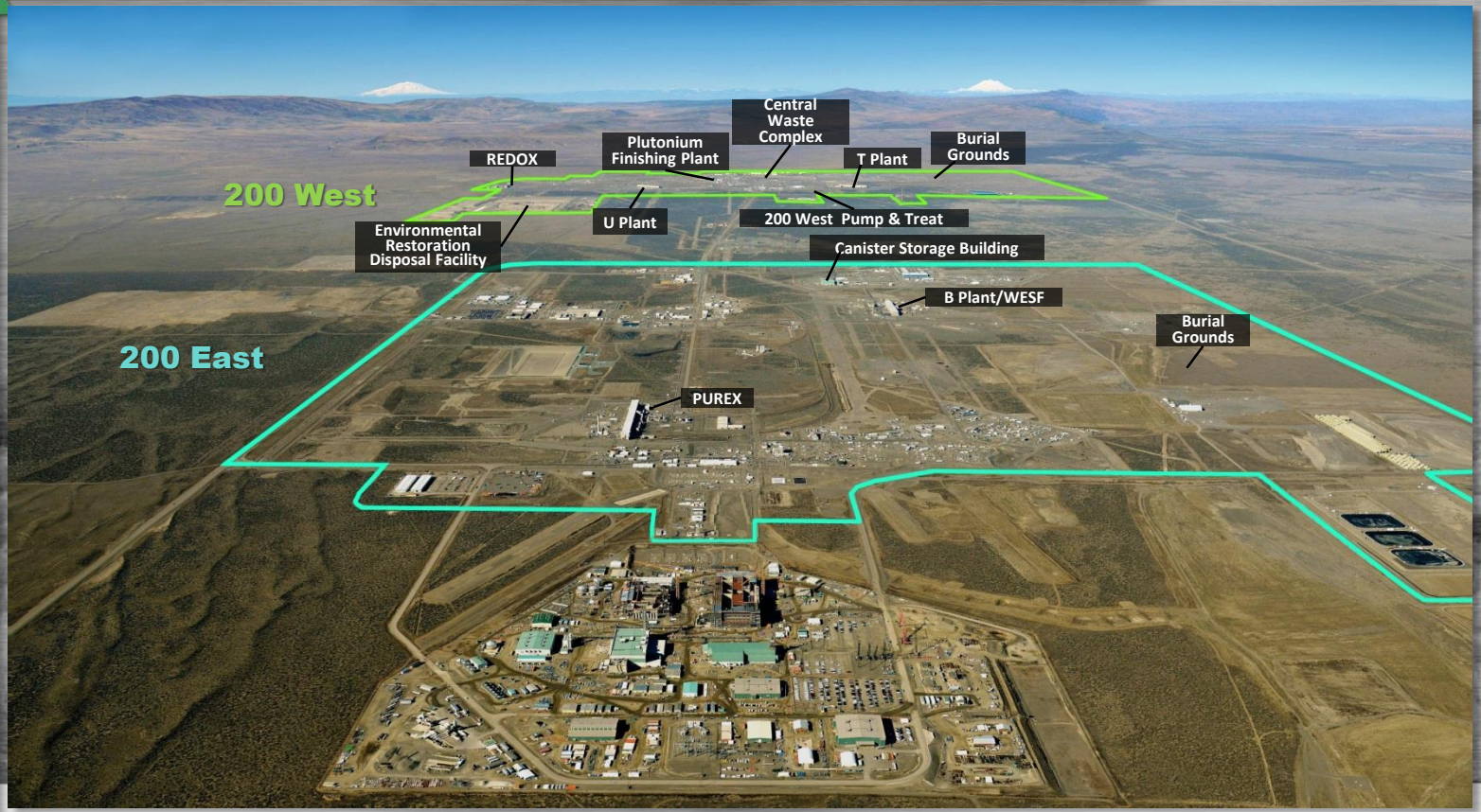
100 K-Area
- Transport sludge to Central Plateau for treatment
- Demolish facilities
- Remediate waste sites
- Put reactors in Interim Safe Storage

Continue groundwater treatment
- Hexavalent chromium pump and treat (D, H and K Areas)
- Strontium apatite barrier (N Area)
- Uranium sequestration (300 Area)

NOTE: Reactor removal and FFTF D&D Post 2030/2040



Today on the Central Plateau



Looking Ahead

- Vast majority of cleanup work scope in River Corridor complete
- All groundwater treatment facilities in place
- Plutonium Finishing Plant work in the final, most challenging stages
- Shifting main focus to Central Plateau

B Reactor 70th Anniversary

Thank you for your service!