

DOE Office of Environmental Management

Integrating New Initiatives and Executive Order 13514 into EM's Mission

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Outline

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EM Mission

“Complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development, production, and Government-sponsored nuclear energy research.”



- Largest environmental cleanup effort in the world, originally involving two million acres at 108 sites in 35 states
- Safely performing work
- In challenging environments
- Involving some of the most dangerous materials known to man
- Solving highly complex technical problems with first-of-a-kind technologies
- Operating in the world’s most complex regulatory environment
- Supporting other continuing DOE missions and stakeholder partnerships



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EM Mission: Program Priorities



- Essential activities to maintain a safe, secure, and compliant posture in the EM complex
- Radioactive tank waste stabilization, treatment, and disposal
- Spent nuclear fuel storage, receipt, and disposition
- Special nuclear material consolidation, stabilization, and disposition
- High priority groundwater remediation
- Transuranic (TRU) and mixed/low-level waste disposition
- Soil and groundwater remediation
- Excess facilities deactivation and decommissioning (D&D)

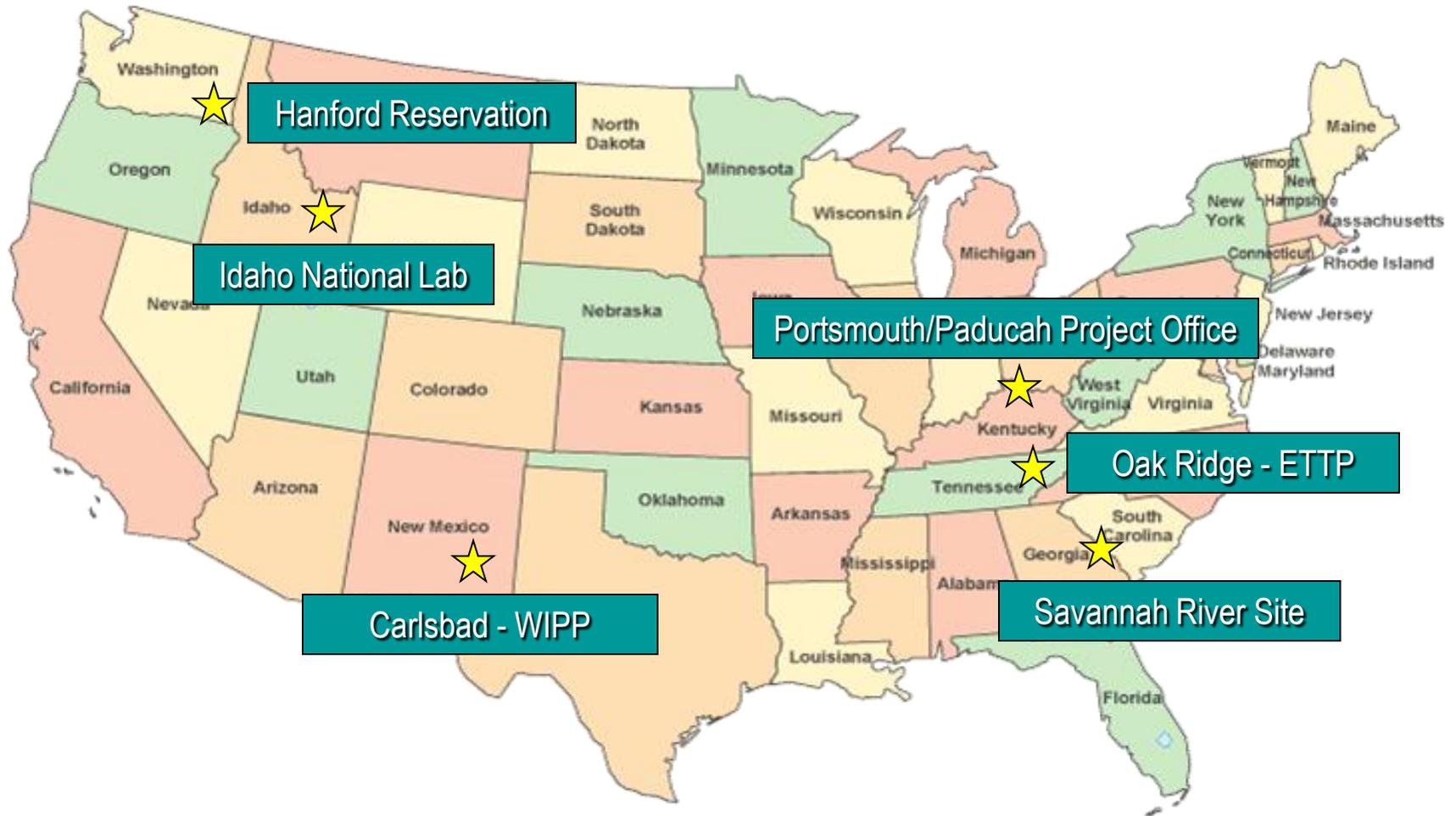


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Facilities: Locations of Major EM Sites



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Facilities: EM Real Property Assets

Real Property Assets	DOE ^a	EM ^b	
		(All)	(Operating Only)
Total Footprint Owned	121 MGSF	31.7 MGSF 26% of DOE	14.8 MGSF 12% of DOE
RPV Owned ^c	\$95.4 B	\$18.3 B 19% of DOE	\$11.6 B 12% of DOE
Number of Assets - Buildings and Trailers	19,283	2,532	1,952
Number of Assets - OSFs ^d		2,233	1,677
Total Number of Real Property Assets		4,765	3,629

^a Source: FIMS historical data for FY 2009. DOE assets reported include land and leased assets.

^b Source: FY 2009 FIMS historical data for FY 2009. Does not include leased property or land. Operating only facilities refers to those facilities designated in FIMS with a status code of Operating (1), Operating Standby (2), or Operating Pending D&D (6).

^c RPVs (Replacement Plant Value) across DOE complex updated in November of 2009. Many sites using FIMS asset models based on RS Means.

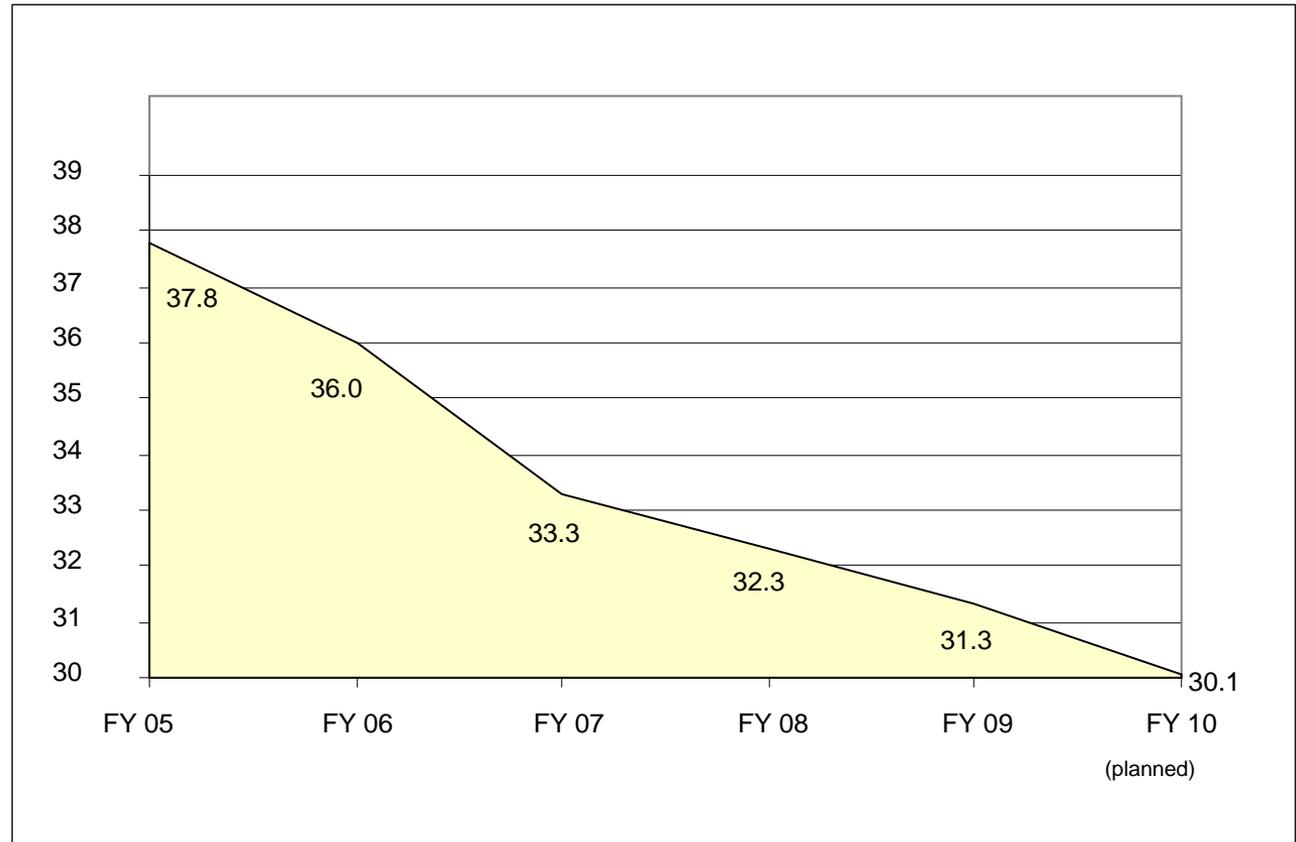
^d OSFs (Other Structures and Facilities) are assets not considered buildings (i.e. fences, paved surfaces, tanks, piping, and electrical systems).



EM Footprint Reduction to Date

EM Year End Total Building Inventory Millions of Gross Square Feet (MGSF)

EM leads DOE in facility disposal. 6.5 million gross square feet of building inventory has been eliminated since the end of FY 2004.



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EM Footprint Reduction to Date

Property Transfers

- Real Property
 - Transferred to the Community Reuse Organization of East Tennessee 290,499 sq-ft. of building space and 647 acres of land at the East Tennessee Technology Park (ETTP), saving \$12.9 M in demolition costs and \$4.2 M in annual maintenance costs. Further transfers are in process and planned.
- Personal Property
 - Transferred a 31-mile waterline to the City of Carlsbad, NM resulting in a secure water supply for WIPP and \$2.6 M in savings for DOE.

Deactivation and Decommissioning (D&D)

- The process of taking an active/excess/abandoned facility to a final disposition end state is called deactivation and decommissioning (D&D). Because of residual radioactivity, and other hazardous constituents, and the physical condition of EM's facilities D&D presents unique hazards that must be addressed from a safety, programmatic, environmental, and technological standpoint.

Deactivation and Decommissioning (D&D)

- These facilities contain many complex systems (e.g. ventilation), miles of contaminated pipelines, glove boxes, and unique processing equipment that require labor intensive deactivation and decommissioning methods.
- More information about DOE's D&D program:
D&D Maps document at:
<http://www.em.doe.gov/pdfs/DDMaps.aspx>

Savannah River Site – T Area Closure



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New Initiatives

- EM agreed to transfer of excess contaminated NNSA, Science and Nuclear Energy facilities – 63 facilities to be transferred in to EM
- At the Oak Ridge Integrated Facility Disposition Project – 223 facilities to be transferred in to EM for cleanup
- American Recovery and Reinvestment Act (ARRA) funding accelerated cleanup and footprint reduction

ARRA Funding

EM Received \$6 Billion in Recovery Act Funding - \$3.32 Billion Allocated to D&D



- Directed towards existing scope that can most readily be accelerated
 - Soil and groundwater remediation
 - Radioactive solid waste disposition
 - Facility decontamination & decommissioning
- “Shovel-ready” projects
 - Fully-defined cost, scope, and schedule
 - Established regulatory framework
 - Proven technology
 - Proven performance
 - Existing contract vehicles
- Focus on EM completion and footprint reduction
- Recovery Act funding will accelerate approximately 48 compliance milestones

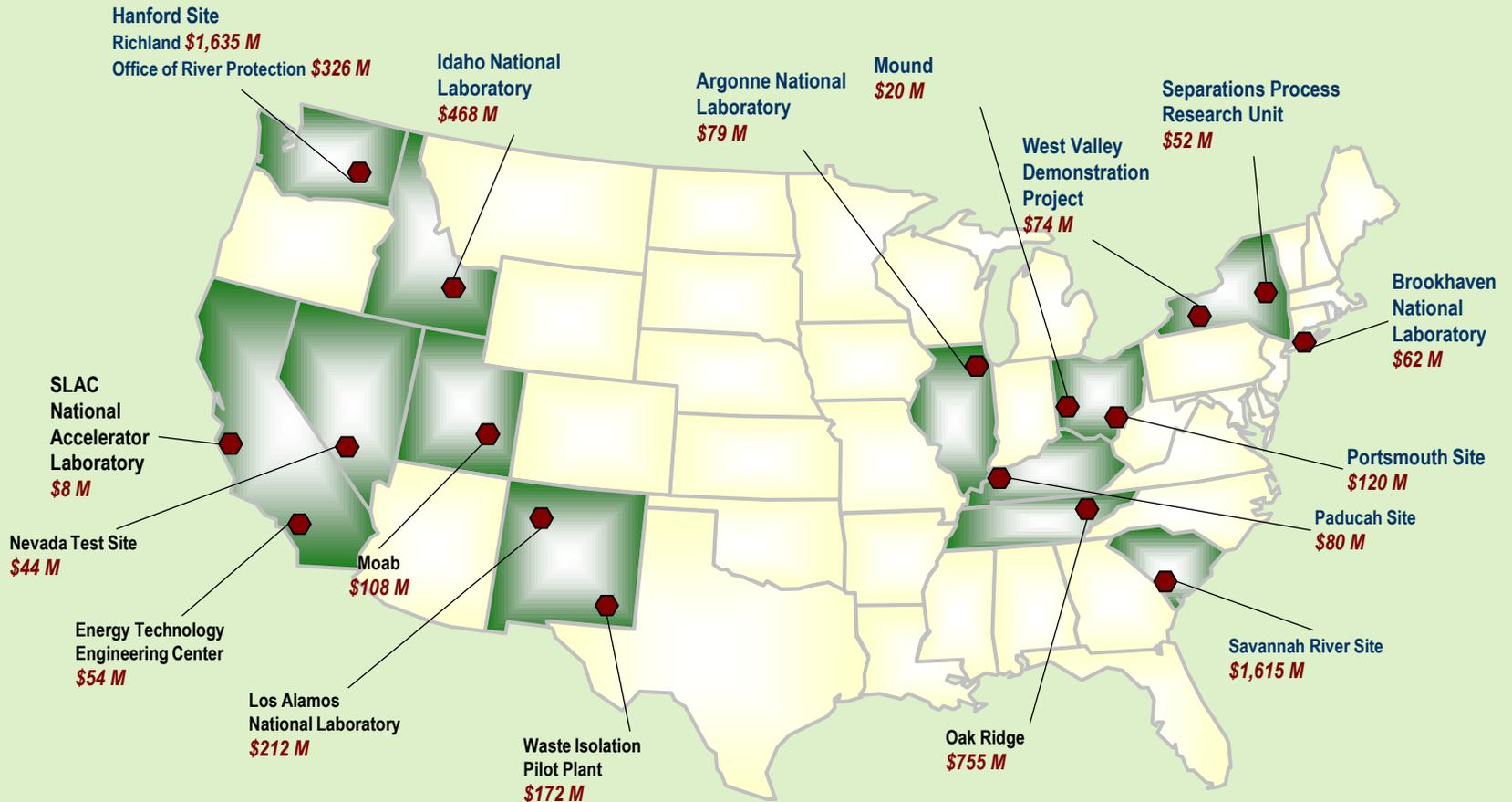


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ARRA Projects Across the Country



12 States, 17 Sites
Uranium/Thorium \$70 M
Management & Oversight \$46 M



ARRA: EM Recovery Act Benefits

- **Facility Cleanout**

- accelerate by 5-10 years clean out of 2.96 million square feet of obsolete nuclear research and production facilities (surplus materials and contaminated equipment)
- paves way for these to be demolished in the future

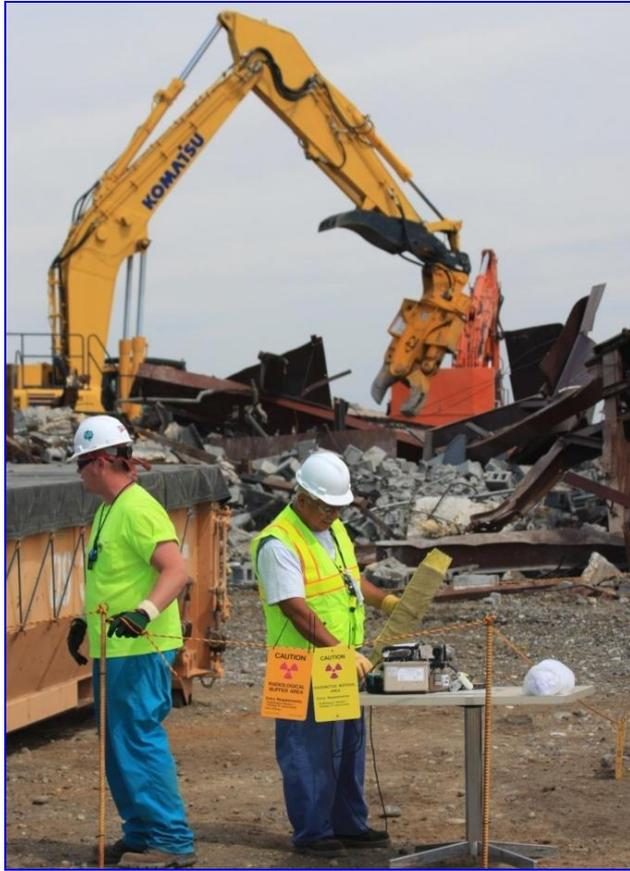


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ARRA: EM Recovery Act Benefits



- **Excess Facility Demolition**

- demolish 3.65 million square feet of excess facilities (approximately 265) and dispose of the resulting debris
- eliminating surveillance and maintenance costs of these facilities
- EM Recovery funding represents a three-fold increase in facility demolition over the next two years
- 16 excess facilities already demolished



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ARRA: Footprint Reduction



Recovery Act



Office of Environmental Management (EM)

EM Footprint Reduction, small site completions, and other investment opportunities

Energy Parks

Clean, Diverse Energy Sources

- Energy security
- Establish long-term site mission
- Sustainable jobs

Large tracts of land and infrastructure available



Jobs created



Lifecycle cost reduced



Environment protected



Footprint reduced

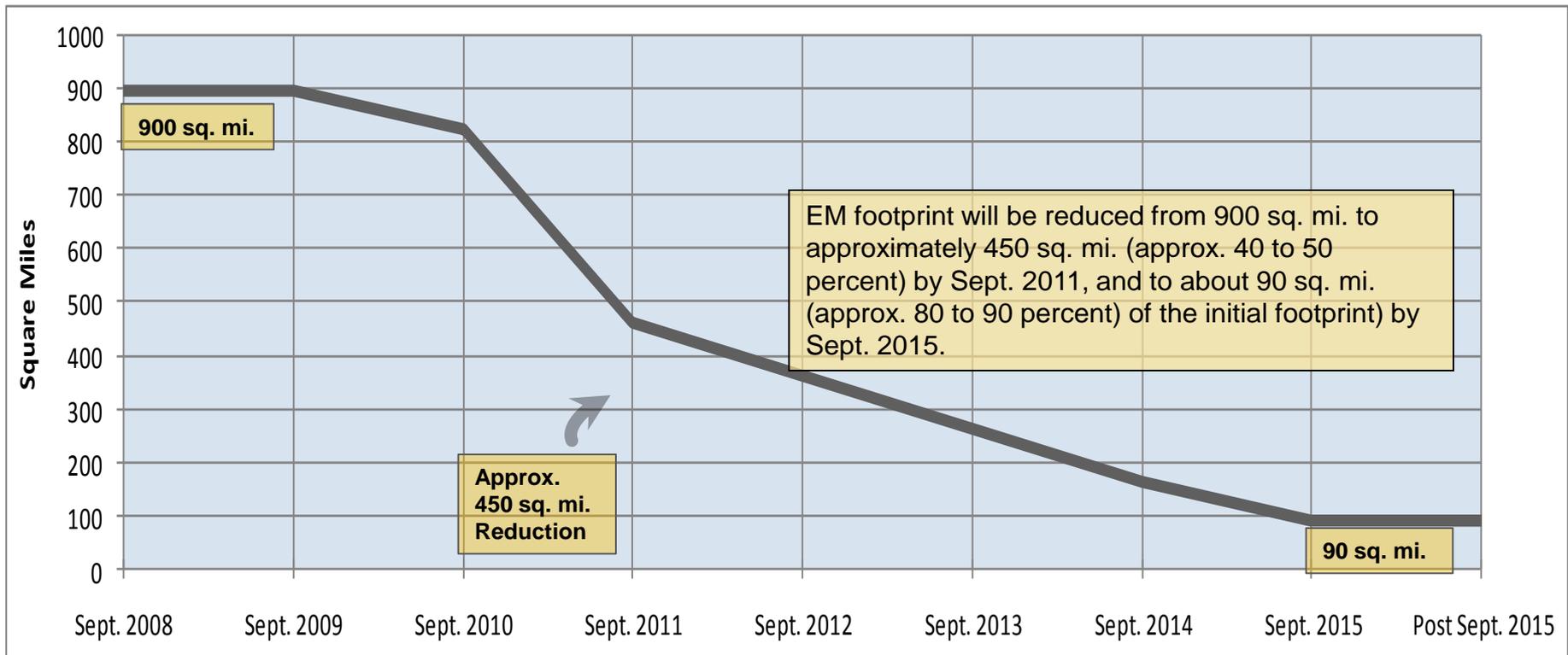


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ARRA: Footprint Reduction (cont.)

Footprint Reduction means that the active DOE EM mission is complete within a particular area in terms of decontamination and decommissioning, waste disposition, ground water remediation, soil removal, etc.



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ARRA: EM Major Achievements

- By December 31, 2010, permanently dispose of over 850,000 cubic meters (equivalent to 340 Olympic swimming pools) of demolition debris and remediated soil.
- By September 30, 2010, 1.5 million tons (equivalent to 10,400 rail cars) of uranium mill tailings will be removed from the pile in Moab, Utah, and permanently disposed. This is 75% of the total ARRA goal of 2 million tons.
- By December 31, 2010, a total of 140 excess facilities (equivalent to 1,500,000 square feet of buildings, or 26 football fields) will be deactivated and demolished.
 - 20 nuclear facilities
 - 50 radioactive facilities
 - 70 industrial facilities



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New Initiatives and FIMS

- EM Project Baselines imperfectly linked to FIMS
- New project scope is being cross walked with FIMS before coming into EM
- ARRA projects are being gradually linked to FIMS to support tracking
- Goal: link all EM baselines to FIMS

EM Challenges in meeting E.O. 13514

- New facilities coming on line before 2020 could increase CO₂ emissions at EM sites by more than 50%
- Post-ARRA EM budgets could be constrained and D&D may not be a high EM priority
- EM sites had significant Energy Savings Performance Contract investments in prior years - SR and RL had more than \$150 million in FY2009 – and future opportunities may be limited
- Meeting High Performance Sustainable Building Guiding Principles will be difficult – EM has many shut-down buildings that won't be demolished for many years.

EM Challenges: 2008 GHG Baseline

	mt CO2/yr	mt CO2/yr
EM FY 2008 Baseline Scope 1 and 2 Greenhouse Gases (GHG)	805,012	
EM potential GHG reductions from completion of West Valley and ETTP missions and completion of Portsmouth D&D by 2020	207,028	
EM projected GHG increases from new facilities coming on line by 2020	466,370	
• Hanford Waste Treatment Plant (WTP)		307,000
• Portsmouth DUF6		20,950
• Paducah DUF6		25,400
• Savannah River Salt Waste Processing Facility (SWPF)		5,020
• Savannah River Mixed Oxide Facility (NNSA)		108,000
New Facilities at EM Sites (total)		466,370



Waste Treatment and Immobilization

- 53 million gallons of radioactive and chemical waste, a legacy from the WW II and Cold War plutonium production eras, are stored in 177 underground tanks on the Hanford Site. An estimated one million gallons have leaked from at least 67 tanks, threatening the nearby Columbia River.
- To address this problem, the US DOE has designed and is building the world's largest radioactive waste treatment plant – the Waste Treatment and Immobilization Plant (WTP), also known as the “Vit Plant”, will use vitrification to immobilize most of Hanford's dangerous tank waste.



Waste Treatment and Immobilization (cont.)



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EM Opportunities in E.O. 13514

- Broaden our risk management considerations to include greenhouse gas emissions and resource consumption in our decision making
 - Consider green remediation where appropriate
 - In addition to potential reduction in fossil energy use, green remediation offers the potential for reduced water use, improved storm water management, and soil sequestration of carbon
 - Consider in situ decommissioning (entombment) where appropriate

In Situ Decommissioning

- In situ decommissioning (ISD) is the permanent entombment of a contaminated facility
- ISD Projects
 - Savannah River P-Area Production Reactor
 - Hanford U-Plant Canyon
 - Idaho National Lab
- ISD may be the best alternative for a significant number of DOE facilities

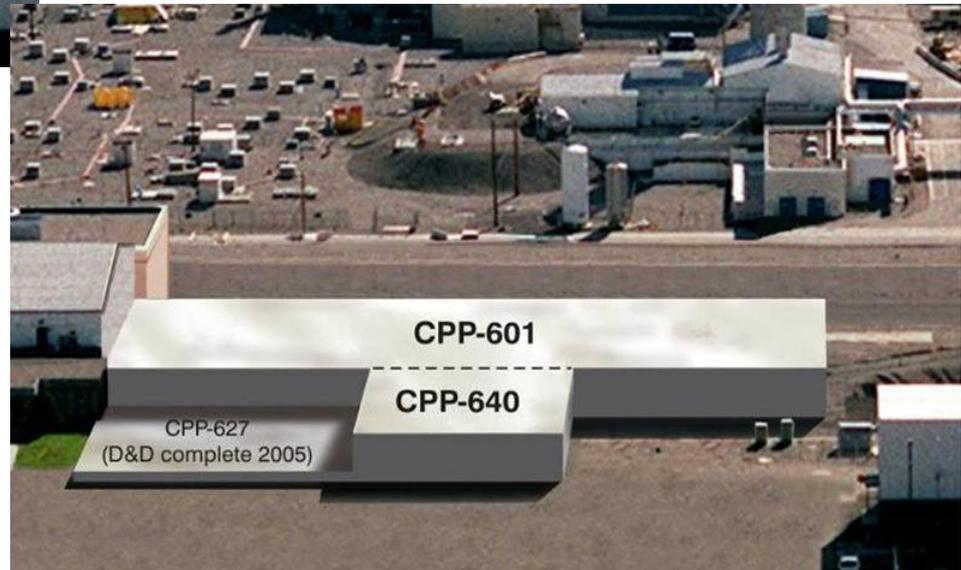
In-Situ Decommissioning



Before

- 125 Potential ISD Candidate facilities
- Total avoided cost approx. \$2 billion

After



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EM Strategies to meet E.O. 13514

- Enhance Culture to Promote Sound Long-Term Stewardship
 - Incorporate GHG considerations into decisions based on cost-benefit analyses
 - Ensure enduring EM sites have robust energy management programs
- Accelerate Clean-Up and D&D Activities
 - Prioritize completing SRS tank waste treatment, Portsmouth and West Valley D&D and ETTP closure on schedule, and accelerated D&D of additional energy consuming excess facilities
- Develop R&D and Apply New Technology
 - Promote ISD and green remediation where appropriate
- Use Alternate Energy Sources
 - RL and ORP are considering use of natural gas instead of diesel fuel for the Hanford Waste Treatment Plant steam plant
 - Promote and seek low-carbon and renewable energy supplies



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EM Strategies to meet E.O. 13514 (Cont.)

- Continue to use alternative financing mechanisms where appropriate for sustainability investments
- Conduct energy conservation evaluations and implement high value projects
- Consider expanded utility metering to identify opportunities for efficiency improvements and to prioritize D&D Projects
- Look for opportunities to reduce energy use at EM process facilities and consider seeking exemptions from GHG reduction target for process facilities such as WTP
- Link Project Baselines to FIMS for more effective planning
- Link Planning Process to Budget
- Continue coordination with Internal and External Partners
 - Field Office and HQ Cross Cutting Work Groups (MA, SC, EERE, HSS)



Questions

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Office of Deactivation & Decommissioning
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<http://www.em.doe.gov/EM20Pages/DDFE.aspx>
D&D Maps:
<http://www.em.doe.gov/pdfs/DDMaps.aspx>



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Summary

- EM's mission directly supports DOE's sustainability goals
- E.O. 13514 offers an opportunity for EM to broaden its risk and stewardship considerations to include GHGs and energy consumption