



DOE Office of Environmental Management

Analysis of Approaches for Supplemental Treatment of Low-Activity Waste at the Hanford Nuclear Reservation

Briefing to
National Academy of Sciences,
Engineering and Medicine

EM Overview

December 12, 2017



EM has a vital and important mission

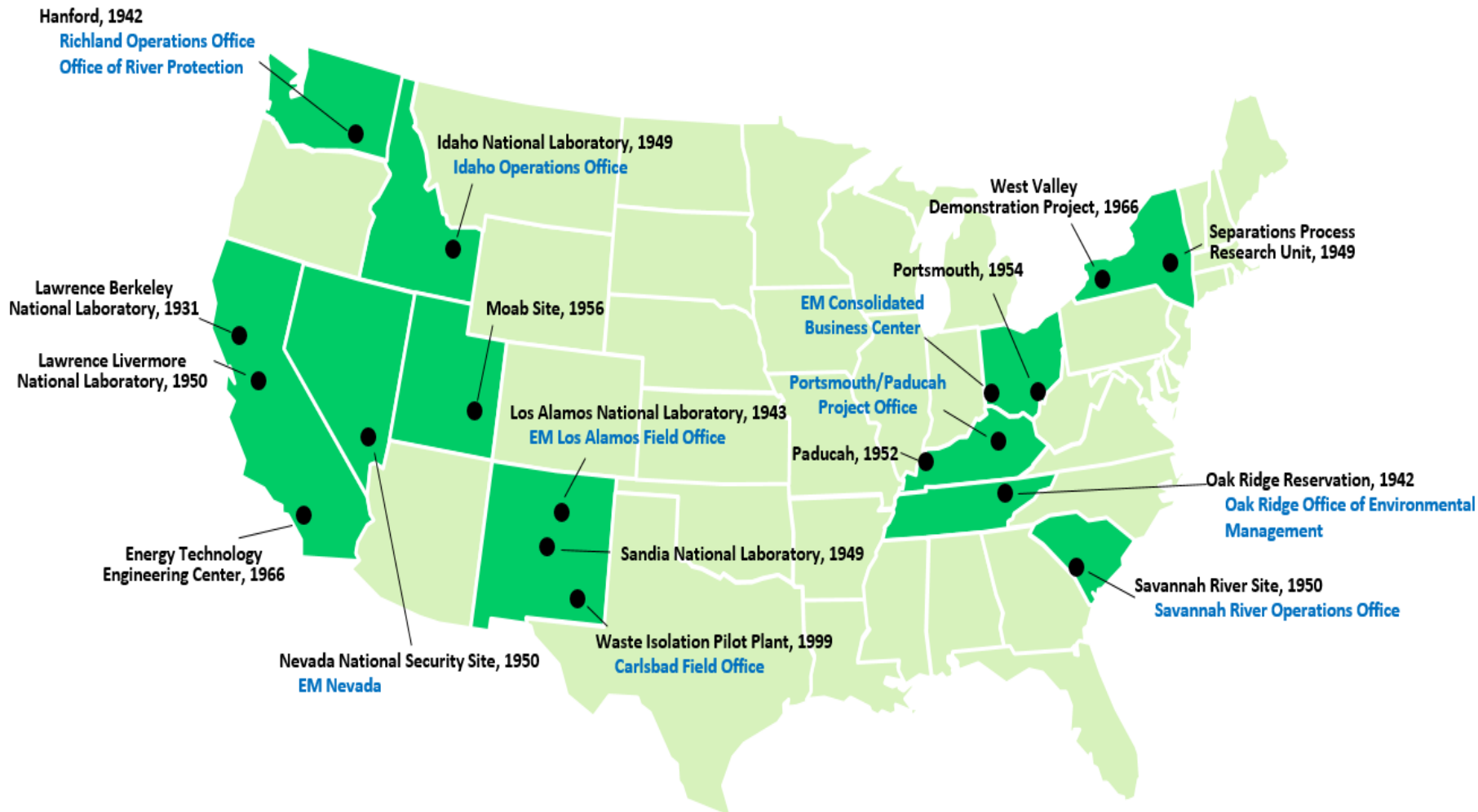
EM MISSION: Complete the safe cleanup of the environmental legacy brought about from decades of nuclear weapons development, production, and Government-sponsored nuclear energy research



- Cleanup includes facility decontamination and decommissioning (D&D), tank waste disposition; transuranic and low level waste disposal; groundwater and soil remediation; and storage, treatment and disposal of DOE spent fuel and other special nuclear materials
- Responsible for safely and successfully performing work in challenging environments
- Operates in a highly complex regulatory environment, with participation from stakeholders
- Enables NNSA, Science, and Nuclear Energy mission success



EM's remaining cleanup responsibilities cover sixteen sites in eleven states



Cleanup has been completed at 91 sites across the country



The EM cleanup challenge is immense



Disposition approximately 100 million gallons of highly radioactive tank waste



Deactivate and decommission (D&D) over 5,000 EM facilities



Protect and clean up more than 10,000 groundwater and soil sites



Tremendous progress has been made since the cleanup program was established in 1989

Major nuclear material production facilities closed

- *Rocky Flats – former nuclear weapons components production facility is now a National Wildlife Refuge (2006)*
- *Fernald – former uranium processing facility supporting is now a nature preserve (2006)*
- *Mound – former tritium recycling facility and weapons components production facility (2010)*

Tank waste stabilized

- Stabilized and isolated millions of gallons of radioactive tank waste at multiple sites
- In 1996, began operation of the first vitrification facility at the Savannah River Site
- From 1996 to 2002, completed vitrifying 275 glass logs of high-level waste (HLW) at West Valley



Rocky Flats Site in July 1995, prior to final cleanup



Rocky Flats Site in June 2007, two years after cleanup



Cleanup is prioritized according to risk and regulatory agreements

Radioactive Tank Waste

\$ 2,403M (37%)

Transuranic & Solid Waste

\$ 832M (13%)

Site Services

\$1,089 M(17%)



EM's FY 2018 Budget Request - \$6.508 Billion Total

Excess Facilities

Facility D&D

\$1,170 M (18%)

Special Nuclear Materials and Spent Nuclear Fuel

\$ 540M (8%)

Soil and Groundwater

\$ 474M (7%)



Savannah River
National Laboratory

Special Projects
Office

EM-1 Assistant Secretary

EM-2 Principal Deputy Assistant Secretary

**EM-2.1 Chief of Staff
DCOS**

- International Program
- Correspondence Center

**EM-4
Regulatory and Policy Affairs
APDAS**

**EM-4.1 Infrastructure Management and
Disposition Policy
Director**

- 4.11 Infrastructure and D&D
- 4.12 Subsurface Closure

**EM-4.2 Waste and Materials Management
DAS**

- 4.21 National TRU Program
- 4.22 Waste Disposal
- 4.23 Nuclear Materials
- 4.24 Packaging & Transportation

**EM-4.3 Regulatory Intergovernmental and
Stakeholder Engagement
Director**

- 4.31 Regulatory Compliance
- 4.32 Intergovernmental and Stakeholder
Programs

**EM-3
Field Operations
APDAS**

**EM-3.1 Safety, Security, and Quality Assurance
DAS
ADAS**

3.11 Field Operations Oversight/CNS

- 3.111 Safety Management
- 3.112 Operational Safety
- 3.113 Standards and Quality Assurance
- 3.114 Safeguards, Security, and Emergency
Preparedness

**EM-3.2 Technology Development
Director**

**EM-3.3 Chief Engineer
Chief Engineer**

- 3.31 Major Constructions and Modifications
- 3.32 Operations and Processes

Field Sites

- Carlsbad
- Idaho
- Los Alamos
- Oak Ridge
- Office of River Protection
- Portsmouth & Paducah
- Richland
- Savannah River Site
- EM Consolidated Business
Center

EMCBC Field Sites

- Moab
- ETEC
- SPRU
- West Valley
- LBNL
- Brookhaven
- EM-NV
- EM NNSA Sites (NNS, LLNL, SNL)
- HQ Field Liaisons

**EM-5
Corporate Services
APDAS**

**EM-5.1 Resource Management
Acting, DAS
ADAS**

- 5.11 Budget and Planning
 - 5.111 Budget
 - 5.112 Program Planning
- 5.12 Information Systems
- 5.13 Workforce Management

**EM-5.2 Acquisition & Project Management
DAS
ADAS**

- 5.21 Acquisition and Contract Management
- 5.22 Project Management

**EM-5.3 Communications
Acting Director**

- 5.31 External Affairs
- 5.32 Communications Services

EM is a field-centric organization.



Our relationship with stakeholders is key to success

- EM HQ collaborates with various state, local, and Tribal governmental agencies, supporting their national intergovernmental organizations with grants and cooperative agreements:
 - State and Tribal Government Working Group (STGWG)
 - National Governors Association (NGA)
 - National Association of Attorneys General (NAAG)
 - Energy Communities Alliance (ECA)
 - National Conference of State Legislatures (NCSL)
 - Environmental Council of the States (ECOS)
- EM's relationship with the Intergovernmental Groups
 - Provides EM with access to a diverse collection of opinions, perspectives, and values
 - Creates an opportunity for stakeholders to provide input on policy decisions
 - Helps avoid misunderstandings, potential conflicts, and litigation
 - Enables EM to make more informed decisions and allows for collaborative solutions to challenging problems
- There are 8 Site Specific Advisory Boards; each provides recommendations on site specific issues such as cleanup standards, waste management, and future land use





We are making significant progress at Hanford



Washington (\$2,304M proposed in FY 18)

Richland (\$800M)

- Continues K Basin sludge removal and supports operations and maintenance of K West Basin
- Supports safe storage of 1,936 cesium and strontium capsules in the Waste Encapsulation and Storage Facility, and continues planning activities to transfer the capsules to dry storage
- Continues integration of site-wide groundwater and vadose zone cleanup activities, groundwater monitoring, operations, maintenance, and necessary modifications of existing remediation systems
- Continues soil and waste site remediation along River Corridor

Office of River Protection (\$1,504M)

- Continues construction and commissioning activities for the Direct Feed Low Activity Waste approach at the Waste Treatment and Immobilization Plant
- Maintaining Tank Farms in a safe and compliant manner
- Conducting Single-Shell/Double-Shell Tank Integrity assessments
- Continuing tank vapors work and supports Single Shell Tank retrievals



Groundwater monitoring activities in Hanford, Washington



Waste Treatment and Immobilization Plant at the Hanford Site in Washington State