U.S. DEPARTMENT OF ENERGY | OFFICE OF ENVIRONMENTAL MANAGEMENT

Office of Site Restoration Overview

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Office of Site Restoration

Mission

- Identify and advance strategies to plan and optimize EM soil and groundwater remediation, deactivation & decommissioning and facility engineering projects, all within a risk-informed, sustainable framework
- Ensure optimized management of projects and technical practices and incorporate transformational technologies that improve efficiency
- Ensure technically-sound environmental and public health risk evaluations and performance assessments for selection of remedies and disposal sites
- Ensure environmental compliance and promote long-term protectiveness of human health and the environment across EM

Office of Site Restoration

Goal: ***Reduce life cycle cost and accelerate cleanup of EM's legacy waste sites in a sustainable manner***

- Perform strategic reviews of site cleanup approaches to ensure maximum return on taxpayer investment
- Work with regulators and stakeholders to develop a consensus vision of compliance and remediation endpoints
- Use risk-informed decision making to improve work prioritization
- Characterize, evaluate, and develop strategies to ensure EM's aging infrastructure can support mission needs
- Incorporate technology development and technical assistance
- Involve small businesses and academic partners; provide test beds; focus on crosscutting solutions
- Work with regulators and stakeholders to develop and implement sustainable remediation strategies

Hot Topics: Technology Development

Soil and Groundwater Remediation, Monitoring, and Modeling

- Testing a new groundwater monitoring paradigm at SRS F-Area using indicator parameters vs. full spectrum analysis
- Stabilizing treatments for elemental mercury contamination in soil at Oak Ridge
- Testing Biogeochemical and gas-phase treatment of technetium-99 in soil and groundwater
- Using Advanced Simulation Capability for Environmental Management (ASCEM):
  - Engineering treatments and monitoring at SRS F-Area
  - Performance assessment of flow paths for SRS H-Area Tank Farm
- Testing various methods for enhanced in situ attenuation of uranium including the addition of Humic acids
- Evaluating the optimal time to operate pump and treat systems

Hot Topics: Technology Development

Deactivation and Decommissioning (D&D)

- Testing a network of sensors at SRS C-Reactor, designed to be embedded in entombed contaminated facilities. This network is designed to provide early warning of breaches in the structure before these contaminants have a chance to migrate to the environment
- Developing technologies to aid in the characterization of contaminated facilities by detecting Tc-99 on the surface of structures
- Mitigating health and safety concerns for D&D workers by developing Advanced Fogging and Delivery Technology that controls mercury vapor
- Developing Radiation Resistant Polymers for use in waste containers
- Developing a database of thousands of robotic/remote controlled systems. D&D mangers will use this database to evaluate the most suitable remote systems that can be applied to their specific D&D challenges.

Hot Topics: Technology Development

3-D Simulation Technologies Improve D&D Work

- GrayQb is a non-destructive examination device that generates gamma radiation contour maps showing source locations and relative radiological contamination levels
- Prototype tested at SRS and at Canadian Nuclear Laboratories (CNL)
- Developed to improve the characterization of contaminated facilities

GrayQb™ SF Version 2

TRU Pad 17 Storage Barrel Cluster

Hot Topics: Technology Development

Crosscutting Technical Teams

- EM is working with other DOE programs on mutual technical challenges
  - Subsurface Technology and Engineering Research (SubTER)
    - Collaborative effort by EM, Office of Science, and DOE Offices of Fossil Energy, Geothermal Energy, Nuclear Energy and others
    - EM will focus on deep borehole waste disposal, universal canisters for cesium/strontium waste, innovative sensing and imaging technologies
  - Water and Energy Tech Team (WETT)
  - Advanced Computing Tech Team (ACTT)

Hot Topics: Aging Infrastructure and Excess Contaminated Facilities

- EM completed its program-wide Infrastructure Review – Parallel to DOE National Laboratory Review conducted in 2014 designed to provide a qualitative assessment of the ability of EM's infrastructure to support EM's operational and function needs

- EM is working with other DOE offices and the Undersecretary's Office to describe the challenge associated with all of DOE's high risk excess contaminated facilities, develop a risk informed prioritization method, and recommend a strategy for addressing priority facilities in an expedited manor

  - EM currently is responsible for more than 2,800 facilities and thousands of miles of buried and aboveground pipelines, most radioactively and/or chemically contaminated
  - An additional 238 facilities have been proposed for transfer to EM in the future (~$5-10B)
  - 1,000+ additional facilities likely to be proposed for transfer to EM by NNSA, SC, NE

Environmental Compliance

Special Topics and Updates

Environmental Compliance Overview

Compliance Drives EM's Mission

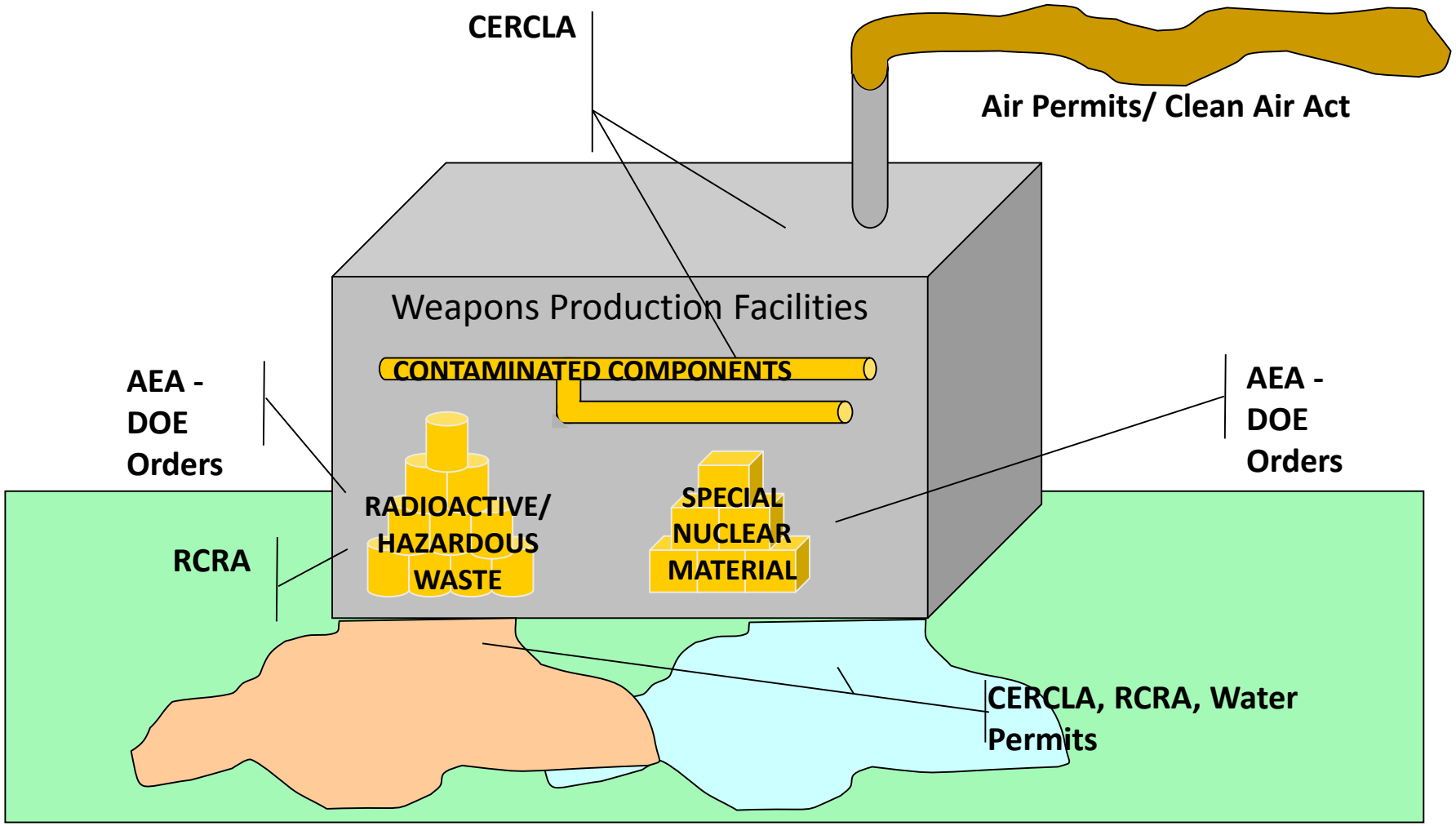
- EM's mission is governed by approximately 40 compliance agreements with state and federal regulatory agencies
  - As many as 200 major enforceable milestones annually
- Cleanup prioritization must be informed by human health and ecological risks
- We are working with regulators and stakeholders to align compliance requirements to maximize achievable risk reduction and program outcomes

Regulatory Overview - "Rosetta Stone"

- CERCLA – Comprehensive Environmental Response, Compensation and Liability Act ("Superfund"): *"If you put it in the ground in the past, dig it up."*
- RCRA – Resource Conservation and Recovery Act: *"If you're going to generate waste, know what you are going to do with it."*
- NEPA – National Environmental Policy Act: *"If you're going to do something, figure out what the environmental impacts are."*
- EA/EIS – Environmental Assessment/Environmental Impact Statement: *"If you figured out the environmental impacts, write it up."*
- ROD – Record of Decision: *"If you figured out what you're going to do, document it."* (CERCLA, NEPA)
- AEA – Atomic Energy Act: *"If it is radioactive waste, DOE can make the rules."* (DOE Order 435.1, Radioactive Waste Management)

Environmental Compliance Overview

EM Workscope with Regulatory/Compliance Drivers



Federal Facility Agreements & Consent Orders

- Most sites negotiated these in early 1990s among DOE, US EPA, States (e.g., Hanford Tri-Party Agreement)
- Establish milestones for DOE to come into compliance with U.S. environmental laws and regulations (e.g., Clean Water Act, Clean Air Act, Resource Conservation & Recovery Act)
- Most include **near-term enforceable** milestones (current year + 1/2/3 years) and rolling **out-year target** milestones (current year + 4/5/6 years)
- Some (e.g., Hanford TPA) include long-term enforceable milestones (e.g., through 2048)
- Stipulate fines and penalties if milestones are missed
- Include provisions for negotiating milestone changes and dispute resolution

National Environmental Policy Act

Overview

- Enacted in 1969
- Requires federal agencies to analyze environmental impacts of their proposed actions/alternatives
- Ensures agencies consider environmental information equally with economic, technical, and other factors – publicly, before make decisions
- Three levels of documentation
  - Categorical Exclusion (CX) – action does not pose significant impacts nor warrant detailed analysis
  - Environmental Assessment (EA)– action does not fit CX, or potential for significant impacts is unknown
  - Environmental Impact Statement (EIS) – actions will have significant impacts

Overview of Current EM Work and Compliance Agreements

- EM has work scope at 17 sites in 11 States
- EM has a variety of compliance agreements at 14 sites in 10 States

Current EM NEPA Activities

- Disposal of Greater-than-Class-C Low-level Radioactive Waste and GTCC-like Waste Environmental Impact Statement; (DOE/EIS-0375)
- Santa Susana Field Laboratory Area IV, CA; (DOE/EIS-0402)
- SA for return of Canadian liquid U.S.-origin uranium
- EA for return of U.S.-origin spent fuel pellets from Federal Republic of Germany
- EA for construction of municipal airport at Oak Ridge
- EA for Land Conveyance at the Hanford Site

Supplemental Environmental Projects

What Is A Supplemental Environmental Project (SEP)?

- Most federal actions for failure to comply with the environmental laws are resolved through settlement agreements
- As part of a settlement, an alleged violator may voluntarily agree to undertake an environmentally beneficial project related to the violation in exchange for mitigation of the penalty to be paid
- It does not include the activities a violator must take to return to compliance with the law

Supplemental Environmental Projects

Categories of Acceptable SEPs:

- Public Health
- Pollution Prevention
- Pollution Reduction
- Emergency Planning and Preparedness
- Assessments and Audits
- Environmental Compliance Promotion
- Other Types of Projects
  - Those that have environmental merit but do not fit within the categories listed above. The types of projects must be fully consistent with all other provisions of the SEP Policy and approved by EPA.

Supplemental Environmental Projects

DOE's Experience with SEPs and Similar Agreements

- Are on a case-by-case basis
- It is an option that is given serious consideration
- Is part of the negotiation process
- Has to make sense for the project and the site goals
- Total cost cannot exceed the amount of the fine
- Negotiated with State regulators and/or EPA

Supplemental Environmental Projects

Examples of SEPs

Richland:

- The purchase of emergency response equipment for local emergency response team (July 2008)
- A new design for HEPA breather filter (April 2008)
- Emergency response equipment for Tri-County HAZMAT (April 2008)
- Two boats for emergency response (November 2007)
- A greenhouse nursery for native plants at WSU-Tri-Cities (November 2007)

New Mexico

- Safer Roads, Improved Water Infrastructure, and Enhanced Emergency Response in New Mexico

Contacts

For more information

http://www.energy.gov/em/services/site-facility-restoration

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