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

Waste Management 2015
Hot Topics Panel

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Office of Site Restoration

Mission

- Identify and advance strategies to plan and optimize EM soil and groundwater remediation, deactivation and 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 at EM sites

Office of Site Restoration

Site Restoration offices

Site Restoration

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Bill Levitan

Environmental Compliance - Rob Seifert

Soil & Groundwater Remediation - Kurt Gerdes

D&D and Facility Engineering- Andy Szilagyi

Site Restoration Goals

Reduce life cycle cost and accelerate cleanup of EM's legacy waste sites

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

Site Restoration Goals, *continued*

Execute the EM mission in a sustainable manner

- Develop strategies to consider sustainable alternatives early in project development
- Continue to work with the Office of Management and Budget, the Environmental Protection Agency (EPA) and other regulators, communities, and other stakeholders to implement sustainable strategies

Environmental Compliance

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 enforceable milestones annually
- Cleanup prioritization must be informed by human health and environmental risks
- We are working with regulators and stakeholders to align compliance requirements to maximize achievable risk reduction and program outcomes

Environmental Compliance

Hot topics

- Conducting complex-wide and Hanford site-wide independent risk reviews
- Using the core team process to integrate regulatory and stakeholder interactions
- Strengthening communities of practice for remedy reviews, compliance, and risk/performance assessments

Environmental Compliance: Risk Reviews

Omnibus Risk Review

- Mandated in Fiscal Year 2014 "Omnibus" Appropriations Act
- Focuses on DOE and DNFSB's identification and use of risk information pertaining to human health, environment, and nuclear safety
- Review *does not* evaluate risks posed by specific facilities or contaminants or compare risks between sites

Hanford Site-wide Risk Review

- Goal: Identify and characterize potential risks to the public, workers, groundwater, Columbia River, and ecological and cultural resources
- Led by the Consortium for Risk Evaluation with Stakeholder Participation (CRESP) with support from Pacific Northwest National Laboratory and a core team from DOE, EPA, & Washington State
- Methodology document under stakeholder review since August 2014

Environmental Compliance FY 2014-2015

Recent accomplishments

- Completed new Interagency CERCLA Five Year Review streamlining tools and training guidance created by EPA, DOE, DOD and DOI; available March 2015
- Low Level Waste Disposal Facility Federal Review Group (LFRG) completed a review of the Special Analysis of the Salt Waste Disposal Facility at Savannah River and the proposed disposal facility at Portsmouth
- Completed regulatory compliance documentation to achieve a Secretarial Determination allowing SRS H Tank Farm closure
- Reinvigorated the Interagency Performance and Risk Assessment Community of Practice (P&RA CoP) to ensure technical consistency and promote best practices in performance assessments, composite analyses, and other health and environmental risk evaluations; technical Exchange Meeting held in December 2014

Soil and Groundwater Remediation

Site restoration activities remain at 16 sites

- Costs and risks increase over time
- Baseline remediation technologies may not be sufficient

Hot topics

- Incorporating systems-based approaches for remediation and monitoring
- Facilitating sharing of lessons learned in remediation
- Selecting remedies holistically and incorporating passive remediation when appropriate
- Improving predictive modeling to reduce unnecessary conservatism, define alternate remediation endpoints, and ensure that selected remedies protect human health and the environment

Soil and Groundwater Remediation FY 2014-2015

Technology development highlights

- Test of new monitoring paradigm at Savannah River Site (SRS) F-Area
- Stabilizing treatments for elemental mercury contamination
- Biogeochemical and gas-phase treatment of technetium-99
- Advanced Simulation Capability for Environmental Management (ASCEM):
  - Simulation of engineering treatments and monitoring paradigm at SRS F-Area
  - Performance assessment of fast-flow paths for SRS H-Area Tank Farm
- Humate amendments for enhanced in situ attenuation of uranium
- Pump and treat optimization and transition to closure

Soil and Groundwater Remediation FY 2014-2015

Site accomplishments

- **Los Alamos:** Investigation and interim remedy to address hexavalent chromium contamination
- **Paducah:** Optimization of Northeast Plume pump and treat system
- **Richland:** Above-target performance of 200 West Pump and Treat System

Hanford 200W Pump and Treat Performance, Nov. 2014

	Target	Actual
Million gallons treated	79.4	158.3
Contaminant removal:		
Chromium, kg	6.3	12.7
Carbon tetrachloride, kg	246	488
Nitrate, kg	5,458	10,764
Technetium, pCi	0.118×10^{12}	0.230×10^{12}

D&D and Facility Engineering

$47-60B completion cost (per FY 2016 Congressional Budget Request)

- More than 2,700 facilities and thousands of miles of buried and aboveground pipelines, most radioactively and/or chemically contaminated
- 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 by NNSA, SC, NE

Hot topics

- EM Infrastructure Review – Parallel to DOE National Laboratory Review conducted in 2014
- Excess contaminated facilities across DOE program offices
    - DOE IG and GAO reports on DOE's management of excess contaminated facilities recommended the development of a more comprehensive and integrated strategy

D&D Hot Topic: IG & GAO recommendations

IG recommendations

- Analyze and report critical information on contaminated DOE excess facilities that would assist policy makers in deciding how to address these facilities
- Based on this analysis, reconsider the current approach for facility disposition to ensure effective expenditure of limited funds and mitigation of risk to the extent practical

GAO recommendations

- Take steps to ensure data systems provide timely and complete data that support sound decision making
- Develop and document an approach to property transfer, including roles and responsibilities, consistent with policy to identify and transfer properties for economic development purposes
- EM should integrate into one prioritized list all NNSA facilities that meet EM's transfer requirements for disposition

D&D and Facility Engineering FY 2014-2015: Site accomplishments

Richland

- River Corridor: 495 of 578 facilities demolished and 1,156 of 1,329 waste sites remediated through FY14.
- Plutonium Finishing Plant: Significant progress; 201 of 238 gloveboxes removed. FY16 target for demolishing the plant to slab-on-grade.

West Valley

- High level waste canisters to be removed this year from Main Plant Process Building to interim, on-site storage facility; critical path work for building demolition.

Oak Ridge

- Deactivation of the K-27 facility is 62% complete and demolition of the K-31 facility is 55% complete; these are the last gaseous diffusion process buildings of East Tennessee Technology Park.
- K-25 Gaseous Diffusion Plant, once the largest building under one roof, was fully deactivated and demolished and all wastes removed.

Portsmouth

- Continuing the removal of contaminated process gas equipment from process buildings.

Paducah

- Complete demolition of the C-410 Complex.

D&D and Facility Engineering FY 2014-2015

Technology development highlight: GrayQb (SRNL)

- GrayQb is a non-destructive examination device that generates gamma radiation contour maps showing source locations and relative radiological contamination levels
- Prototype tested at Savannah River Site and at Canadian Nuclear Laboratories (CNL)

GrayQb™ SF Version 2

TRU Pad 17 Storage Barrel Cluster

Site Restoration Hot Topic: SEAB review of TD

Report issued by Secretary of Energy Advisory Board (SEAB) Task Force on EM Technology Development (TD)

- Secretary Ernest Moniz chartered Task Force to evaluate TD issues, including opportunities and barriers to implementation and funding
- Report recommended a coordinated portfolio of research and development investments for EM
  - Incremental TD
  - High-impact TD
  - Fundamental research addressing EM challenges
- Provides an opportunity to re-evaluate EM TD program structure
- EM will release its response shortly

Site Restoration Hot Topic: Technical Crosscuts

Crosscutting technical teams sanctioned by S-1

- 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)

Site Restoration Hot Topic: Workforce Development

Technical training for EM's future workforce

- DOE Traineeships will support graduate students in EM-relevant disciplines
- Minority Serving Institutions Partnership Program (MSIPP)
  - Supports competitive research and student internships
  - Facilitates collaborations between minority serving institutions and DOE national laboratories in EM mission areas
  - Conducts an annual research solicitation

SRNL Director Dr. Terry Michalske and Ms. Faith Kibuye, an EM-funded student at Benedict College

Conclusions

- Risk-informed decision making is critically needed to progress in site restoration (environmental compliance, soil and groundwater remediation, and facility D&D)
- Technology development is widely recognized as an important tool for reducing life cycle costs
- EM must use all available sources of expertise to meet the challenges
  - Sister programs in DOE (e.g., crosscutting initiatives)
  - Stakeholders and regulatory partners (core teams, communities of practice)
  - Universities, DOE laboratories, and small businesses (technology development, workforce development)

Contacts

For more information

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

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