U.S. DEPARTMENT OF ENERGY

RISK AND CLEANUP DECISION MAKING

Presented to
Environmental Management Advisory Board

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Topics

- How we got to where we are
- Existing environment and health risk analysis to support decision-making
- Considerations going forward

The Past Five Years

- FY2008 budget assumed ~$6 billion escalated for inflation over the following four years
- Re-baselined the program and in some cases renegotiated milestones and contracts to align with the budget profile
- Milestones were negotiated in good faith (~40 agreements/~200 major milestones/year)
- Recognition that approximately 50% of the EM budget is “min safe”
- New scope arose, projects were not executed according to plan
- National priorities have resulted in diminished discretionary funding
- ~$5.65 billion in FY2011 and FY2012; expected in FY2013
- EM has met more than 90% of its milestones, with ARRA funds and modifications

Environmental Management Priorities

- Activities to maintain a safe and secure posture in the EM complex
- Radioactive tank waste stabilization, treatment, and disposal
- Spent nuclear fuel storage, receipt, and disposition
- Special nuclear material consolidation, processing, and disposition
- High risk soil and groundwater remediation
- Transuranic and mixed/low-level waste disposition
- Soil and groundwater remediation
- Excess facilities deactivation and decommissioning

Risk, Compliance, and Priority Setting

- Environmental Compliance: One of EM's top program drivers
- Conflict of top down (Federal budget process and targets) and bottom up (site-specific needs)
- Risk prioritization: Existing processes provide the framework
  - Sequence and schedule – Federal Facility Agreements and Consent Orders
  - Remedy Selection – CERCLA Nine Criteria and Waste Determinations/Disposal Authorization Statements
- Decisions regarding cleanup priorities are

  Risk-INFORMED … NOT Risk-BASED

1996 Federal Facilities Environmental Restoration (Keystone) Dialogue Committee: "Process Recommendations"

- Developed by federal and state agencies, tribal nations, and stakeholder groups (http://www.epa.gov/fedfac/fferdc.htm)
- Provided the basis for several of EM's processes:
  - Early public and tribal involvement (e.g. Integrated Priority Lists)
  - Communication (recognizing the embargo period)
  - Coordination among multiple regulators
  - Transparency and confidence in the risk ranking methodology
  - Rolling milestones
  - Flexible fair share allocation of shortfalls
  - Predictable but not necessarily level funding

1996 Federal Facilities Environmental Restoration Dialogue Committee: "Risk Plus Other Factors"

- Future land use
- Cost effectiveness and relative risk reduction value
- Life cycle cost analysis
- Actual and anticipated funding
- Ecological impacts
- "Mortgage" reduction
- Support to other agency missions
- Technology

National Governors Association Federal Facility Task Force Principles for State and DOE Engagement

- States support a sustained, quality cleanup that protects human health, safety, and the environment and complies with state-DOE agreements.
- Open and transparent communication between states and DOE is essential for achieving successful cleanup.
  - Issues that have complex-wide implications should have complex-wide input and planning.
- State participation is a critical element of the DOE budget process and the establishment of environmental priorities.
  - States support a "risk plus other factors" approach to priority- setting, as defined in the Final Report of the Federal Facilities Environmental Restoration Dialogue Committee.
- Proactive engagement between DOE and states is crucial when milestones or other commitments may be in jeopardy.
  - In cases where one or more Federal Facility Agreement would be impacted by changes in another state's cleanup agreement, states will seek to develop a common understanding of the requested change.

NAS Study: Sustainability and the U.S. EPA

- NAS study completed for the U.S. Environmental Protection Agency (EPA) in September 2011.
- The committee recommended that EPA adopt or adapt a comprehensive Framework which requires a comprehensive approach including specific processes for incorporating sustainability into decisions and actions.
- EPA should incorporate upfront consideration of sustainability options and analyses that cover the three sustainability pillars (social, environmental, and economic), as well as trade-off considerations into decision making.
- Although the committee limited its recommendations to EPA, it felt that these recommendations are pertinent to the concerted effort of all federal agencies and sectors of society to meet the challenges of a sustainable future.

Risk Informed Prioritization Process

The Consortium for Risk Evaluation with Stakeholder Participation (CRESP) developed a risk-informed prioritization process/system (tool) for EM's Oak Ridge Office which enables users to assign a *Risk Rating* (to evaluation the severity of the associated human health and environmental risks) and a *Risk Management Rating* (to evaluate the effectiveness, capacity and efficiency of risk mitigation approaches) for specific Oak Ridge EM projects.

The risk-informed prioritization system:

- Provides balanced approach between
  - Protection and remediation of environmental resources
  - Treatment and disposition of radioactive waste and special nuclear materials
  - Deactivation and decommissioning of facilities
- Recognizes that human and environmental risks are key factors shaping prioritization
- Allows responsible parties (DOE, EPA and TDEC) to consider exogenous factors in addition to risk input

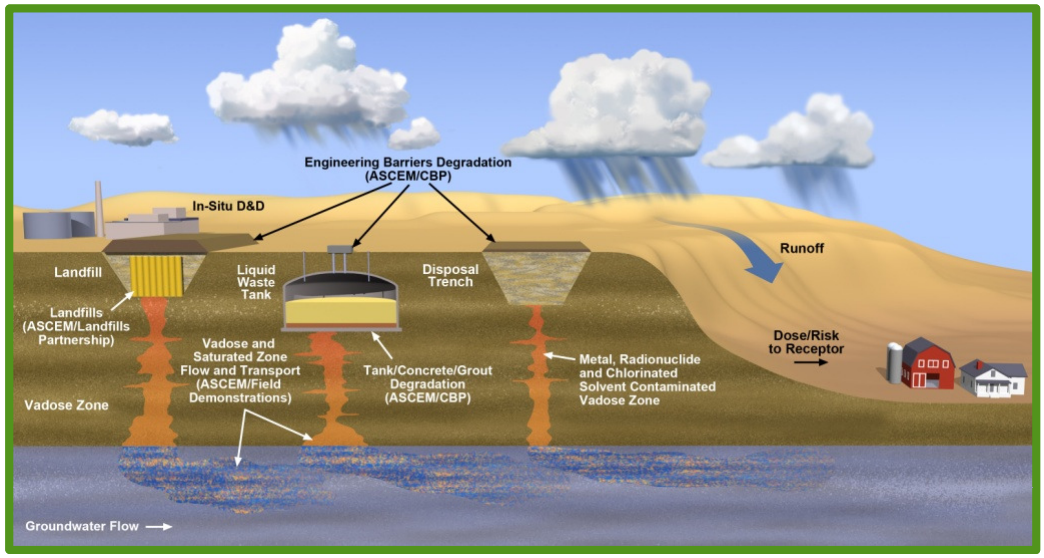
The goals of CRESP's risk informed prioritization process includes:

- enabling decision-makers to focus on *temporal* aspects of risk and risk mitigation strategies (including, significantly, the potential for risks to change with time and the need for sequencing and efficiency in project management
- ensuring *transparency* in the evaluation process for all concerned parties (DOE-HQ, regulators, stakeholders, etc.); and
- facilitating the consideration of *exogenous* factors (*e.g.*, funding availability, institutional priorities, existing contracts, *etc.*) in developing risk-informed prioritization rankings.

NAS Workshops for Next Generation, Risk-Informed Clean Up and Closure

NAS charged by EM to facilitate workshop series bringing together

- DOE, DOD, others
- EPA (regions and HQ), NRC
- State Regulatory Agencies and the Environmental
- Key Stakeholders
- SMEs from national labs and universities



- Holistic approaches for remediation of sites with multiple contaminant sources and multiple post-closure uses, including technically based point-of-compliance and point-of-use monitoring locations.
- Effective post-closure controls: monitoring, engineered controls and natural controls
- Assessing performance of site remedies and closures, especially technically advanced approaches that reduce performance uncertainties and need for post-closure controls on land use, resource management and intruder prevention.
- Risk-informed decision-making

Considerations Going Forward

- Many DOE sites are large with federal presence over the long-term
- Institutional controls: future use, long-term stewardship, monitoring, Five-Year Reviews
- Location of points of compliance (risk envelope)
- Alternate cleanup levels other than drinking water standards for groundwater
- EM Internal Remedy Reviews
- Coordinate with the Department of Defense's cleanup program
- DOE Order 435.1 Radioactive Waste Management processes (performance-based)
- Advanced simulation capability
- Integration of Natural Resource Damages considerations
- Application to RCRA and NEPA decision-making
- Case studies: Oak Ridge, Hanford Central Plateau, Los Alamos above-ground TRU, Savannah River tank farms

Background: CERCLA Nine Criteria

THE CERCLA NINE CRITERIA ARE NOT ALL EQUAL:

Threshold Criteria

1. Overall protection of human health and the environment
2. Compliance with ARARs (applicable or relevant and appropriate standards)

Primary Balancing Criteria

3. Long-term effectiveness and permanence
4. Reduction of toxicity, mobility or volume
5. Short-term effectiveness
6. Implementability
7. Cost

Modifying Criteria

8. State acceptance
9. Community acceptance