

U.S. Department of Energy

REPORT TO THE ENVIRONMENTAL MANAGEMENT ADVISORY BOARD

Incorporating Risk and Sustainability into Decision Making

Submitted by the EMAB Risk Subcommittee

Background:

In December 2011, Acting Assistant Secretary, David Huizenga, U.S. Department of Energy (DOE) Office of Environmental Management (EM) asked the Environmental Management Advisory Board (EMAB or Board) to establish a Risk Subcommittee and in February 2012, approved the Subcommittee's Work Plan. Under the Work Plan, the purpose of the Subcommittee is to evaluate "risk-informed decision making" and its potential to assist EM leadership in developing EM funding priorities.

The Subcommittee was asked whether the prioritization tool developed by the Consortium for Risk Evaluation with Stakeholder Participation (CRESP) for use at the Oak Ridge Reservation (Oak Ridge) is one that should be applied at other EM sites, and if so, to provide specific recommendations as to how this could be implemented, "while making this process more transparent to, and engaging its stakeholders."

Additionally, the Subcommittee was asked to evaluate how EM can incorporate sustainability into the planning and decision making of environmental cleanup, while actively engaging stakeholders, specifically analyzing the Environmental Protection Agency's (EPA) "sustainability toolbox" and the National Academy of Science's (NAS) Reports, "*Sustainability and the U.S. EPA*" and "*Sustainability for the Nation: Resource Connection and Governance Linkages*."

In June 2013, the Subcommittee presented an interim report to the full EMAB. This report is the final report addressing these charges.

Risk-Informed Decision Making

As of May 2014, there is no final CRESP report on the work completed at Oak Ridge, so the Subcommittee will present its findings based on the last draft reviewed. With the consideration of lessons learned from the Oak Ridge CRESP report the Hanford Site-Wide Risk Review will develop a Hanford site-wide assessment of human health, nuclear safety, environmental and cultural resource risks from former defense operations with participation by the State of Washington (Departments of Ecology and Health), US Environmental Protection Agency (EPA) and DOE with additional input from tribal nations, Defense Nuclear Facilities Safety Board (DNFSB), elected officials and a broad set of stakeholders.

The results of this review will include a cataloguing of environmental and nuclear safety hazards and risks, along with a foundation for incorporating national sustainability objectives and focusing optimization efforts for cleanup.

The study is an independently led (CRESP) site-wide evaluation and listing of nuclear safety and environmental hazards and risks at the Hanford Site. The risks will be evaluated both in the context of current and potential impacts to human health, environmental, ecological and cultural resources. The focus of the review is on risk characterization, along with other factors associated with risk management, future waste management and remedial decisions. The review will also consider the safety hazards and risks in context with nearby land uses and activities that have a potential to impact risk and natural resources. The goal is to develop a site-wide risk review that would result in a common understanding of environmental hazards and risks that would provide a basis for discussions among DOE, regulators, stakeholders and the public.

The intention is for the study to produce a summary level technical set of Hanford site environmental and nuclear safety hazards and risks. The technical summary would include a narrative of each problem (e.g. waste management facility/unit, plume, tank waste etc.) for grouping and understanding like elements and locations; radionuclide or contaminant inventory; pathway identification; timeframes or events associated with risks; severity of risk if exposures occur; and current planned or approved remedial objectives. This would result in a qualitative evaluation that would provide a “risk rating” or relative risk binning – not a risk ranking. It could be used as a tool for identifying opportunities for improved cleanup decisions or optimization of cleanup or for pointing out disconnects between remedial objectives, sustainability objectives and identified risks.

Sustainability:

The Subcommittee has reviewed NAS’s report, “*Sustainability for the Nation: Resource Connections and Governance Linkages*.” The National Research Council (NRC), which is part of the NAS, was charged with providing an analytical framework, which incorporates the linkages of sustainability into decision making. Specifically, the NRC was asked to:

- Identify impediments to interdisciplinary, cross-media federal programs;
- Recommend priority areas for interagency cooperation on specific sustainability challenges; and
- Highlight scientific research gaps as they relate to these interdisciplinary, cross-media approaches to sustainability.

The report defines a ‘sustainable society’ as “one that can persist over generations; one that is far-seeing enough, flexible enough, and wise enough not to undermine either its physical or its social system of support.”¹

¹ *Sustainability for the Nation: Resource Connections and Governance Linkages*, National Academies of Sciences(2013), quoting, Meadows, D. H., D. L. Meadows, and J. Randers. *Beyond the Limits*. White River Junction, VT: Chelsea Green Publishing (1992).

The report determined that federal agencies' sustainability efforts are inconsistent with the cross-cutting nature of sustainability challenges.² The connection of social-ecological systems and the link between government institutions and organizations is important when addressing sustainability issues.³ Although, tradition has dictated that federal agencies work independently of one another, even when that work is interconnected, a systems approach is important in working towards sustainability goals.⁴ The report recognizes that there are challenges to a systems approach, but successful governance depends on strong organizational interaction and collaboration.⁵ There are significant barriers to this, including, but not limited to, legal limitations, funding, a lack of coordinated research, and an absence of incentive to work together.⁶ Funding challenges are a significant barrier. Agencies typically undertake activities only when funds are appropriated for an activity, and because of this cross-cutting agency work is not undertaken. But, the report argues that data sharing between agencies could prove to be a way for agencies to actually cut costs and promote efficiency, and that by reducing these barriers it would allow for greater collaboration among the agencies and organizations.⁷

The report recommends a new decision framework that considers the connections among government institutions and other organizations, identifies the key players, and determines what should be done.⁸ The recommended framework has four phases:

- Preparation and Planning. This phase will consist of framing the issue, identifying the players, and creating a management plan.
- Design and Implementation. This phase will consist of determining goals, creating an action plan, and implementing the action plan.
- Evaluation and Adaption. This phase will consist of realizing short term outcomes, assessing outcomes, and adjusting actions.
- Long Term Outcomes. This will consist of tracking the goals that were identified in the first phase.

It was designed to aid federal agencies in examining the tradeoffs, consequences, synergies and operational benefits of sustainability-oriented programs, while creating a flexible and streamlined approach that enhances the legitimacy and relevance of the government's process.⁹

The report found that:

- The connection of environmental, economic, and social issues makes sustainability difficult to address.
- The federal government is not organized to deal with the complexity of sustainability.

² *Sustainability* at 1.

³ *Id.* at 1.

⁴ *Id.* at 3, 26.

⁵ *Id.* at 4.

⁶ *Id.* at 4.

⁷ *Id.* at 5.

⁸ *Id.*

⁹ *Id.* at 7.

- There are examples of collaborative networks that transcend organizational and resource boundaries.
- Success of sustainability issues in the federal government is dependent on: the engagement and agreement of stakeholders on important issues; the integration of the environmental, economic, and social dimensions; and a strong science base linked with decision making.

The report stated that effectively implemented sustainable efforts would improve the efficiency of government actions, and minimize unintended consequences.

The reports final recommendations are that federal agencies should:

- Adopt the prescribed framework;
- Adopt a National Sustainability Policy to give agencies clear guidance on how to address governance linkages on complex sustainability issues.¹⁰ A National Sustainability Policy would assist with fragmentation of issues, and increase collaboration among agencies and promote transparency.¹¹
- Identify key administrative, programmatic, funding and other barriers and develop ways to reduce these barriers;
- Legitimize the activities of individuals who engage in crosscutting sustainability initiatives, both at staff and management level;
- Support long-term interdisciplinary research on sustainability; and
- Support scientific research that incentives collaboration.

Additionally, NAS organized a workshop series examining “*Best Practices for Risk-Informed Remedy Selection, Closure, and Post-Closure Control of Contaminated Sites*” with Federal agency representatives, state regulators, key stakeholders, and technical experts. The first workshop, held in October 2013, examined the challenges to regulatory flexibility and risk-informed decision making, and the holistic approaches that could be taken to overcome these barriers. It also examined ways to incorporate sustainability into site remediation.

The second workshop, held in January 2014, explored risk-assessment and decision making, the assessment of long-term performance of site remedies, and post-closure and long term stewardship. A workshop summary and report is pending. EMAB Risk Subcommittee members participated in both workshops.

Findings and Observations:

In December 2012, the Subcommittee submitted an interim report that deferred making any recommendations, while two critical documents were completed: the final CRESP report, and the results of NAS’s Sustainability Linkages study.¹²

¹⁰ *Id.* at 11.

¹¹ *Id.* at 70.

¹² *First Interim Report to the Environmental Management Advisory Board, “Incorporating Risk and Sustainability into Decision Making.”*

The interim report recognized the increased pressure on the EM program, as a result of the reduced funding level. Despite this, the Subcommittee observed that EM's obligations under Federal Facility Agreements (FFAs) should be negotiated first and only then if funding is not received should DOE and the States negotiate revised cleanup milestones.¹³ The interim report also noted that if delays in meeting milestones and other priorities occur that information on risk be made available to the public, and that stakeholders be involved in the evaluation of risk and project priorities. The report, also, documented the importance of the facilitation of a neutral party, while determining project priorities.

The Subcommittee made these observations following review of the CRESP model, NAS's report, "*Sustainability and the U.S. EPA,*" and additional relevant information both internal and external to EM; and by conducting meetings and teleconferences with CRESP and EM personnel.

To supplement the work of the previous report and in preparation for this report, the Subcommittee has reviewed the CRESP led Oak Ridge Site-Wide Risk Review site-wide evaluation and NAS's "*Sustainability for the Nation: Resource Connection and Governances Linkage;* participated in NAS's "*Best Practices for Risk-Informed Remedy Selection, Closure, and Post-Closure Control of Contaminated Sites*" workshops and conducted teleconferences to discuss these items.

Following the first NAS workshop, the panel made the following broad reflections:

- It is important to understand the difference between restricted and unrestricted use.
- There is a need to define what end use is.
- There is flexibility in existing processes.
- Adaptive management is essential.
- Everything needs to be on the table at the same time.
- The sequence of work is important.
- Risk communication is essential.

The Subcommittee supports these reflections and agrees with the general sentiment of NAS's workshops on "Best Practices" in the broadest sense. Specifically, the Subcommittee supported the following concepts:

- CERCLA is more flexible than thought.
- Compliance is a major driver for EM.
- Process must be transparent and must give stakeholders an opportunity for participation.
- Outside resources should be brought in to do independent risk assessment.
- The goal is to manage risk to acceptable levels.

The Subcommittee recognizes there are elements of the CRESP report that may be useful to

¹³ Interim Report

DOE-EM. As the report suggests, a transparent process is important. It is essential to involve stakeholders from the beginning of the decision-making process and to allow them to see the progression of a DOE-EM decision, especially given the impacts of these decisions and the current budget restrictions. The methods of the CRESP report could be helpful to DOE-EM to explain to the public the decision-making process.

Recommendations:

To further aid the Assistant Secretary in efforts to improve risk-informed decision making, the Risk Subcommittee offers the following recommendations:

Recommendation 2014-01:

The Subcommittee acknowledges that reaching consensus on the definition of risk is difficult, but that a prioritization of resources based on risk and other factors may necessitate it. The lack of a concrete definition makes establishing risk prioritization difficult. A workable definition of risk and a value system should be created to determine risk prioritization.

Recommendation 2014-02:

DOE-EM should not adopt the CRESP processes in their entirety, but use CRESP as a mechanism to incorporate additional factors, outside the normal factors of risk, such as the impact on culture, into decision-making. DOE-EM may also use these processes to communicate to the public why some projects are chosen, while others are delayed.

Recommendation 2014-03:

The Subcommittee is aware that different sites will require different techniques to communicate risk to the public, based on the varying capabilities at each site. CRESP's techniques at Oak Ridge may not be appropriate at every site. Some sites lack the capabilities of Oak Ridge, and for those sites that do lack those capabilities, even a simple breakdown of risk concerns that go into decision-making would be beneficial.