

**FIRST INTERIM REPORT TO THE
ENVIRONMENTAL MANAGEMENT ADVISORY BOARD**

Incorporating Risk and Sustainability into Decision Making

Submitted by the EMAB Risk Subcommittee
December 3, 2012

Background:

In December 2011, then Acting Assistant Secretary for Environmental Management David Huizenga, asked the Environmental Management Advisory Board (EMAB or Board) to establish a Risk Subcommittee. In February 2012, the Subcommittee's Work Plan was approved. Under the Work Plan, the purpose of the Subcommittee is to evaluate "risk-informed decision making," specifically 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. If it is, the Subcommittee is tasked to make recommendations on how the CRESP developed tool should be implemented. Additionally, the Subcommittee is requested to consider how a risk-informed approach for priority setting at EM sites might be accomplished "while making this process more transparent to, and engaging its stakeholders".

Secondly, the Subcommittee is tasked with reviewing "incorporating sustainability into the planning and decision making for environmental cleanup projects building on what EPA has developed". The Subcommittee was referred to the National Academy of Science's (NAS) Report, "*Sustainability and the U.S. EPA*" for review and requested to include as part of its inquiry how stakeholders might be actively engaged in any process developed for incorporating sustainability.

As a backdrop for the Work Plan, the Subcommittee was referred to the Special Report issued in November 2011 by DOE's Inspector General (IG) Gregory H. Friedman on DOE's Management Challenges for Fiscal Year 2012.¹ One of the challenges identified is environmental cleanup. In his report, the IG recommended that DOE consider "revising its current remediation strategy and instead address environmental concerns on a national, complex-wide risk basis". According to the IG, the current strategy centers on commitments made in 37 site-specific individually

¹ Environmental cleanup is listed as a challenge in the IG's most recent report. See *Management Challenges at the Department of Energy – Fiscal Year 2013*, October, 2012.

negotiated Federal Facility Agreements (FFA) involving at least 350 milestones and funding is targeted based on ensuring those milestones are met. But, the IG proffered that this strategy may be unsustainable in the current budget climate. As a path forward, the IG urged DOE to place risk as the driver for targeting scarce resources, so that “only high risk activities that threaten health and safety or further environmental degradation” are funded.²

At its spring meeting, the Board was briefed on risk and cleanup decision making. The presentation made clear that the Fiscal Year 2008 assumption of annual baseline funding at \$6 billion, escalated for inflation, is no longer valid. Congressional priorities have changed and discretionary funding for EM cleanup projects has diminished, evidenced in the decrease to \$5.65 billion in baseline funding for Fiscal Years 2011 and 2012. Cleanup priorities were set based on the higher funding level. Managing risk with less funding that neither the sites, nor EM can control, poses challenges. EM is concerned about the tough choices that likely must be made in the near future as it adjusts to the altered funding paradigm.

While the Subcommittee appreciates DOE’s concern for the overall reduction of the federal budget, the Subcommittee also is aware of the inherent, site-specific nature of the legal obligations created under federal cleanup statutes. The predominant applicable cleanup statute, the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA),³ created the mechanism of FFAs through which the CERCLA portion of cleanup compliance schedules is determined at each site. This federal statute, and not state governments, requires that the cleanup process be based on agreements reached with states. The “model” provisions contained in most of the DOE FFAs require DOE to plan and seek budget allocations which comply with milestones, not to set milestones based on anticipated shortfalls in funding.

Other significant agreements controlling cleanup are the Site Treatment Plans for “mixed wastes,” part of the 1992 Federal Facilities Compliance Act (FFCA)⁴ amendments to the Resource Conservation and Recovery Act (RCRA) statute.⁵ Inasmuch as the established milestones in either an FFA or another compliance agreement, such as a Site Treatment Plan, may require greater funding levels than Congress may provide in a given year, there is flexibility to re-negotiate at the site level in the event of insufficient funding.

The Subcommittee opted to proceed by reviewing available information from relevant sources both internal and external to EM. This has included conducting meetings and teleconferences with acknowledged experts. Additionally, all relevant EM program areas have ensured access to information requested by the Subcommittee.

² See *Management Challenges at the Department of Energy – Fiscal Year 2012*, Exhibit 4, p. 10.

³ 42 USC §103 (1980).

⁴ P.L. 102-386 (106 STAT 1505)(1992).

⁵ 42 USC §6901 et seq. (1976).

Discussion:

Risk-Informed Decision Making

CRESP is multi-disciplinary consortium of universities whose objective is to advance environmental cleanup by finding ways to improve the scientific and technical basis for management decisions at EM sites and foster public participation in the search. CRESP has conducted various studies across the EM complex for at least a dozen years. Recently, CRESP completed a draft pilot that involved DOE-EM's Oak Ridge office, the Environmental Protection Agency (EPA), Region 4, and Tennessee Department of Environment and Conservation (TDEC) on the development of a "risk-informed prioritization system" for implementation at Oak Ridge.

The impetus for the pilot was the recognition that stable funding was no longer assured and that this instability was placing in jeopardy the agreed upon cleanup milestones at Oak Ridge. So, rather than focusing on enforcement to obtain compliance, the regulatory agencies along with DOE-EM voluntarily agreed to work together on an alternative strategy on cleanup priorities. CRESP designed a risk prioritization template or model that would allow all three agencies to assess and rate the level of risk for a particular project element, which could then be used to make risk-informed judgments about the projects evaluated.

CRESP's model is a multi-step process. The first step includes a project definition, a summary or narrative of the current state and risk of the project. The second step evaluates the severity of human health and environmental risks posed against defined metrics. Three factors are evaluated and rated: hazard identification and characterization (e.g., special nuclear materials, wastes); pathways or routes to human and ecosystem exposure and natural resource degradation; and consequences (where current and potential future human and ecosystem exposures or injuries and degradation of natural resources are considered). The evaluation for each of the three factors is based on answers provided to several questions, which are used to assign a risk rating of very high, high, medium, or low for each factor. The "risk" factors described above were defined by CRESP, DOE, and the regulators. The next step of the evaluation is to incorporate risk management factors into the overall prioritization process. The focus is on the effectiveness of risk reduction with management considerations as modifiers. Under CRESP's model, the evaluation of risk management factors is completed only for the highest risk categories and consists of two parts. The first part is an evaluation of the risk reduction effectiveness of the mitigation option or options selected to reduce the human health and environment risks posed by the problem being addressed. Again, individual project elements are rated based on the answers provided to specific questions, which are used to assign a rating of very high, high, medium or low for risk reduction effectiveness.

The second part in the overall risk management judgment is an assessment of the timeline and efficiency for implementation. To make a determination, two items are taken into account: capacity (workforce availability and disposition path availability) and efficiency (project

sequencing requirements for completion, project cost, mortgage reduction, and the cost of delay). After answering specific questions, projects are rated as discussed above for capacity and efficiency.

The last step in the CRESP model is for DOE-EM Oak Ridge's office, EPA, and TDEC to use both the risk ratings and the risk management ratings to be considered in establishing priorities for specific activities taking into consideration input gathered from stakeholders and other outside sources that could influence decisions, such as congressional mandates. CRESP's model envisions that the project narrative, risk rating and risk management ratings would be used as communication tools. The City of Oak Ridge asked to provide input into the original process, but was told that the study would only include the three named parties.

As part of the development of the template for project evaluation as discussed above, CRESP teams held several workshops and meetings with the three agencies and helped complete evaluations of seven project areas at Oak Ridge. Considerable time was spent on each evaluation to ensure that all relevant documentation on the project was located and reviewed. Each evaluation also includes a list of references and supporting documentation. Additionally, the evaluations were written using consistent concepts, terms, and language to help ensure transparency in evaluation and so that they could later become a tool for communicating with Congress and other stakeholders and outside groups.

Several challenges emerged during this phase of the pilot, such as the difficulty CRESP had in obtaining information needed to describe and evaluate selected projects. The information may not be available and when available sometimes it was not easily identifiable or was not filed and archived consistently across project types (e.g., waste processing and environmental restoration). Additionally, access restrictions to data (such as "official use only") at times impeded efforts to ensure all potentially relevant data could be obtained and reviewed.

CRESP's work on the model, and involvement as a neutral participant, facilitated discussions and helped evaluate selected projects. The CRESP template developed aided in the successful renegotiation of certain milestones enforceable under Oak Ridge's FFA. As part of the negotiation, the agencies agreed that funding for cleanup priorities would remain stable for three years and their corresponding milestones would be enforceable for three years as well. A report of CRESP's work is being finalized.

Local communities and tribal governments have made it clear that any risk-based analysis must include the affected local governments, tribes and stakeholder involvement. According to a 2007 analysis prepared by the Energy Communities Alliance (ECA) on cleanup work completed at various EM sites, discussions, which need to take place throughout the process, must also include the question of technical risk and perceptions of risk, recognizing perceptions of risks

posed do not always align with the technical risk.⁶ Successful environmental cleanups are not limited to only reducing risk and thus minimizing the federal government's liability.⁷ Success is also predicated on substantively incorporating the local community and applicable tribal governments' values into the risk-based decision making as part of the cleanup process.⁸ Excluding these groups from a process that defines risk can have an adverse impact on the acceptance of risk without the integration between tolerated and non-tolerated risk.

As for risk communication, ECA has indicated that this issue is vitally important to understand, especially for those parties charged with implementing and regulating cleanup.⁹ A party's acceptance of risk most often breaks between tolerated risks and non-tolerated risks, and does not necessarily track quantifiable, scientific risk.¹⁰ For this reason, one of the critical lessons learned from the success and challenges at EM sites is the importance of developing and implementing a risk communication process.¹¹ According to ECA, it is through such a dialogue that the various parties have the greatest chance to reconciling differing perspectives on the question of risk and thus reaching agreement on difficult cleanup decisions.¹²

As part of its evaluation of CRESP's tool, the Subcommittee has analyzed how EM and other agencies define "risk" as well as a review of the tools used to make judgments about risk. An example, the National Research Council (NRC) of the NAS has defined "risk" as "a hazard, a probability, a consequence, or a combination of probability and severity of consequences."¹³ The Subcommittee's review to date has revealed that EM has adopted various definitions of "risk" cited in guidelines and policy documents. Two examples of the definitions that EM has used include:

Risk: Probability of a specific outcome, usually adverse, given a particular set of conditions.¹⁴

Risk: A concept used to give meaning to things, forces, or circumstances that pose danger to people or what they value. Descriptions of risk are typically stated in terms of the likelihood of harm or loss from a hazard. They usually include an identification of what is "at risk" and what may be harmed or lost, what causes the harm, and the likelihood of the harm. Examples of what

⁶ Energy Community Alliance, Seth Kirshenber, Paul Kalomiris, Sara Szynewski & David Abelson, *The Politics of Cleanup: Lessons Learned from Complex Federal Environmental Cleanups*, 32 (2007).

⁷ *Politics of Cleanup* at 36.

⁸ *Politics of Cleanup*, at 36.

⁹ *Politics of Cleanup*, at 7.

¹⁰ *Politics of Cleanup*, at 7.

¹¹ *Politics of Cleanup*, at 7.

¹² *Politics of Cleanup*, at 7.

¹³ National Research Council of the National Academy's Committee to Review the OMB Risk Bulletin, Scientific Review of the Proposed Risk Assessment Bulletin from the Office of Management and Budget, Washington DC: National Academy Press, 2007, on Page 26

¹⁴ *Presidential/Congressional Commission on Risk Assessment and Risk Management*, 1997.

may be harmed or lost are: health of human beings, health of an ecosystem, personal property, quality of life, and economic harm.¹⁵

In other EM documents, the term “risk assessment” is defined:

Risk Assessment: The probability that something will cause injury, combined with the severity of the potential injury.¹⁶

Risk Assessment: Scientific and/or technical document that assembles and synthesizes scientific information to determine whether a potential hazard exists and/or the extent of possible risk to human health, safety or the environment.¹⁷

In the past, EM has utilized the EPA guidance on the *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, when implementing risk assessment.¹⁸ The guidance clarifies what baseline risk levels require a remedial or removal action, and what situations require action despite the fact that the baseline risk levels are acceptable.¹⁹ When determining the baseline risk assessment, the current and potential threats to human health and the environment are examined.²⁰ Chemical specific standards and potential noncarcinogenic effects may also be used to make a determination of potential risk.²¹ Based on these assessments, a determination is made of whether Section 104 or 106 of CERCLA applies.²² The Record of Decision (ROD) should include the baseline risk assessment, making sure to incorporate any non-standard exposure factors that require remedial action, despite the fact that the baseline risk standard is met.²³ The ROD should also document any decision not to seek remedial action, or when seeking remedial actions, the ROD should record the remediation goals and the risk level for each “chemical of concern.”

Another source of guidance reviewed by the Subcommittee derived from the states on the Federal Facilities Task Force of the National Governors Association (NGA). In May 2012, in

¹⁵ *Understanding Risk Informed Decisions in a Democratic Society*, NAS, 1996.

¹⁶ *Risk Report to Congress*, 1995.

¹⁷ The Risk Management Task Force of the National Research Council (NRC) Office of Management and Budget, Proposed Risk Assessment Bulletin, 2006, Page 8, quoting, National Research Council *Risk Assessment in the Federal Government: Managing the Process*, Washington DC: National Academy Press, 1983. Office of Management and Budget, Proposed Risk Assessment Bulletin.

¹⁸ See United States Environmental Protection Agency, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* (1991).

¹⁹ See United States Environmental Protection Agency, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* (1991).

²⁰ See United States Environmental Protection Agency, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions* (1991).

²¹ See United States Environmental Protection Agency, *Role of the Baseline Risk Assessment in Superfund Remedy Selection Decisions*, Page 3, (1991).

²² *Id.* at 4.

²³ *Id.* at 2.

consultation with DOE-EM, they approved a set of four principles to guide “the planning and prioritization of cleanup projects while the available budget for cleanup is constrained”.²⁴ The principles are:

- 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.
- State participation is a critical element of the DOE budget process and the establishment of environmental priorities.
- Proactive engagement between DOE and states is crucial when milestones or other commitments may be in jeopardy.

The Subcommittee also is aware that affected local communities seek the ability to provide input and have expressed concern about whether there is room to renegotiate cleanup schedules as a result of diminished budgets “without compromising health and safety”.²⁵

Sustainability

The Subcommittee has reviewed NAS’s report prepared at the request of EPA. The NRC subgroup of NAS was tasked to provide a framework which would incorporate sustainability into the regulatory responsibilities of EPA. Specifically, NRC was asked to investigate the following questions:

- What should be the operational framework for sustainability for EPA?
- How can the EPA decision-making process rooted in the risk assessment/risk management (RA/RM) paradigm be integrated into this new sustainability framework?
- What scientific and analytical tools are needed to support the framework?
- What expertise is needed to support the framework?

In the report, the following premise regarding sustainability is accepted: “Everything that humans require for their survival and well-being depends, directly or indirectly, on the natural environment. “ Additionally, the report did not spend time defining “sustainability”; rather it

²⁴ See letter dated July 5, 2012 to David Huizenga from Dan Crippen, Executive Director, NGA

²⁵ See Energy Communities Alliance, Seth Kirshenber, *Executive Director’s Message: Here we go again---DOE and the Risk Discussion*, 2012

turned to NEPA's²⁶ goals and the following definition: "to create and maintain conditions, under which humans and nature can exist in productive harmony, that permit fulfilling the social, economic, and other requirements of present and future generations".²⁷

The report recommends that EPA's operational framework should be: transparent and clear, practical to implement, lead to goals and objectives that can be measured, provide flexibility to deal with scientific, technical, and economic development for long time frames, work consistently with current risk assessment/risk management paradigms, and facilitate decision making.

The recommended framework is now being rolled into a broader NRC study, *Sustainability Linkages in the Federal Government*. This is designed to develop a decision framework to help all federal agencies examine the consequences, tradeoffs, synergies, and operational benefits of sustainability-oriented programs. The framework will include social, economic and environmental dimensions of sustainability. The second objective is to identify and describe the most critical linkages between domains, with potential sustainability impacts. A series of meetings have been held across the country and the study is expected to be completed in the Spring 2013 timeframe.

Additionally, the NAS has organized "a series of workshops on best practices for risk-informed remedy selection, closure and post closure control of radioactive and chemically contaminated sites that cannot be remediated for unrestricted release". A workshop held in October 2012 explored "risk-informed decision-making that incorporates a sustainability framework into site remediation, closure, and post-closure control of contaminated sites". Workshop participants included federal agencies with cleanup programs such as DOE and the Department of Defense, federal regulatory agencies, stakeholders, states, and subject matter experts. A workshop summary and report of all workshops will be published.

Interim Observations:

The Subcommittee believes it must defer making recommendations until such time as two critical documents are completed and available for review: the final CRESPP report on the work completed at Oak Ridge and the results of the Sustainability Linkages study currently underway at NAS. The Subcommittee, however, does offer the following interim observations based on the activities undertaken to date:

²⁶ The National Environmental Policy Act of 1969, 42 U.S.C. § 4321 et seq (1970) as amended (Pub. L. 91-190, 42 U.S.C. 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, § 4(b), Sept. 13, 1982)

²⁷ See Executive Order 13514, 2009

- Budget trends continue to indicate increasing pressure on program direction. Annual baseline funding for environmental cleanup complex wide is no longer at the \$6 billion level and may not remain at the current level of \$5.65 billion.
- EM assumes that 50 percent of the budget is “minimum safe” and not negotiable as the “mortgage” or “landlord” costs are static. As such, cuts to EM’s budget will affect ability to clean up. It would be appropriate for the “minimum safe” definition to be evaluated on a site-by-site basis to determine how to better achieve complex-wide consistency and identify budget efficiencies.
- Environmental compliance with FFAs and relevant federal laws, such as CERCLA and NEPA is a key program driver, but diminishing budgets for cleanup will lead to unavoidable delays in meeting site specific cleanup milestones and other commitments.
- Rather than decry or ignore the very existence of the FFAs created by federal law and milestones under the FFAs, which have been negotiated in good faith, DOE first should request funding to meet the milestones in all the site-specific agreements. In the event funding is not provided by Congress after DOE has made its most persuasive case for funding, which is supported by the States, DOE and the States should cooperate to revise cleanup milestones. States are not merely negotiating milestones to achieve a set level of funding, but are identifying actions necessary to achieve cleanup at a schedule that will require a set level of funding in order to maintain compliance.
- To make informed judgments on project priorities, the information needed to describe and evaluate risk must be readily identifiable and consistent across project types (such as by using a common information base). Additionally, providing a project summary with an appendix that lists all references and supporting documentation increases understanding of what parties are discussing.
- Having a neutral party involved in facilitating discussions on the evaluation of projects for the purpose of setting project priorities is helpful as long as all parties participating in the discussion voluntarily agree to use such a neutral party.
- Involvement by states, host communities, tribes, and other stakeholders means better decisions will be made about project priorities at EM sites.
- Any future model would need to be rolled out and shared with parties with a deliberate end date in order for the activity to be meaningful.