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CTDEEP

Thank you for the opportunity to comment on *Evaluation of Risk-Based Decision Making – Final Report prepared for CTDEEP, dated 29th August 2014.* I applaud CTDEEP initiating this endeavor, which will significantly enhance Connecticut DEEP's Remediation Transformation package to be delivered to the legislature in October. The authors of the report provided a thorough scientific review and analysis of risk-based decision making in other state, federal and international programs within a short period of time.

Because my expertise is in ecological risk assessment, my comments focus on primarily Section 7 Best Practices in Ecological Risk Assessment and Ecological Risk Management. My comments are structured following the outline of the report's recommendations described in the Executive Summary.

Third, we suggest that (i) DEEP fully and electronically document all of the underlying assumptions, models, exceptions, and other aspects of each default criterion in the RSRs; (ii) DEEP consider updating these criteria, per British Columbia's criteria, to account for risks to soil invertebrates and to plants as well as for risks to public health; and (iii) to the extent that legislative involvement is currently required before criteria are updated, this requirement be modified to grant DEEP the requisite authority.

Adopting standards based on invertebrates and plants similar to British Columbia is not recommended, since there is always uncertainty associated with the derivation of ecologically-based criteria. Default criteria intended to be protective of terrestrial biota are often defined as chemical concentrations in soil below which toxic effects are not observed. Typically sensitive test organisms are selected for soil toxicity tests used to derive these ecologically-based criteria. Sensitive test organisms may not be representative of similar terrestrial species inhabiting a contaminated site.

An alternative approach is recommended for the derivation of site-specific soil criteria protective of invertebrate and plants indigenous to the habitats identified on the site. This approach would be applied in a screening-level ecological risk assessment (SLERA). The selection process of the ecologically-based soil criteria could be described in an ecological risk assessment guidance document. These criteria are widely used in screening-level ecological risk assessments. In 2003, EPA developed a process to derive a set of risk-based ecological soil screening levels (Eco-SSLs) for many of the soil contaminants frequently of ecological concern for plants and animals at hazardous waste sites and provides guidance for their use. [USEPA, 2003 Guidance for Developing Ecological Soil Screening Levels]

Fourth, we suggest that DEEP adopt and, as needed, adapt the successful ecological risk assessment and ecological risk management programs already in place in Massachusetts and in British Columbia.

I support this recommendation. In 1996, I participated in the Massachusetts DEP Ecological Risk Assessment Working Group where decision trees were developed for both terrestrial and aquatic habitats. Sites that offered minimal habitat value were eliminated early in the site investigation process. In 2001,

the Texas Commission on Environmental Quality also established a workgroup comprised of technical experts from industry, government,

consulting firms, and academia to assist in developing ecological risk guidance. This is an excellent example of ERAG, which was created through a collaborative process. The “Final Report” recommends habitat evaluation checklists that are used in Texas, Ohio (EPA), and Oregon (DEQ): truly negligible sites are screened out with a checklist/site visit (e.g., indicating no habitat, receptors, or complete pathways). A habitat evaluation checklist could be readily incorporated into the CTDEEP’s Site Characterization Guidance.

I learned from reading the CDM Smith’s report that DEEP has two DRAFT documents under development:

- *A DRAFT Ecological Risk Assessment Guidance, Connecticut Department of Energy and Environmental Protection; and*
- *Connecticut DEEP Screening Level Ecological Risk Assessment Guidance Document, DRAFTDOCUMENT.*

The completion of these draft documents would justify convening an external working group consisting of industry, government, consulting firms, and academia to assist in the development of the final documents.

It is recommended that CTDEEP also create an internal multidisciplinary committee to establish “Best Practices” for natural resource or ecological valuation that could be used as a tool for CTDEEP site managers for ecological risk-based decision making.

This also suggested to USEPA. *“Local and regional regulatory processes are conditioned by community values and economic objectives as well as by ecological conditions. Therefore, aligning the decision and the supporting risk and economic analyses with “what matters to people” is essential to achieve acceptable risk solutions that can be easily and effectively communicated to the public. To achieve such alignment, EPA should increase its understanding of and capacity to utilize ecosystem valuation methods in conjunction with such decisions”*[Advice to EPA on Advancing the Science and Application of Ecological Risk Assessment in Environmental Decision Making: A Report of the U.S. EPA Science Advisory Board]

“Because ecological risk assessments often fail to identify and prioritize uncertainties that may affect the quality of risk management decisions, uncertainties that profoundly affect the results and outcome of risk assessments should be identified and acknowledged during problem formulation. Furthermore, the use of adaptive management with iterative triggers for action offers promise as a way of dealing with uncertainties in ecological risk assessments”

Fifth, we suggest that DEEP encourage the use of advanced, site-specific risk assessments for sites where application of RSR default criteria may be inappropriate.

As a risk assessor with 20-year plus experience, site-specific risk assessments help mitigate uncertainty associated with default criteria such as RSRs, provide better transparency of the risk analysis process and allows for more scientifically-defensible risk management decisions.

Finally, sixth, for potentially carcinogenic site contaminants, we suggest that DEEP adopt risk management goals for the reasonably maximally exposed individual (RMEI) of up to 1 in 100,000 per chemical, and up to 1 in 10,000 per site.

I agree with the recommendation 1 in 100,000 per chemical, and up to 1 in 10,000 per site. The calculation of site cancer risk includes the use of chemical-specific cancer slope factors.

“Slope factors generally represent an upper bound on the average risk in a population or the risk for a randomly selected individual but not the risk for a highly susceptible individual or group. Some individuals face a higher risk and some face a lower risk. The use of upper bounds is generally considered to be a health-protective approach for covering the risk to susceptible individuals, although the calculation of upper bounds is not based on susceptibility data.” [EPA/630/P-03/001F March 2005 Guidelines of Cancer Risk Assessment. Risk Assessment Forum]

Because the numbers of individuals who would be reasonably maximally exposed at contaminated site in Connecticut cannot be in the millions or tens of millions, allowable individual risk estimates should not be as stringent as 10⁻⁶. Approximately 20 years ago, U.S. EPA considered the development of the 10⁻⁵ and 10⁻⁴ "acceptable" risk levels, using a number of models that were more realistic, since they more readily addressed the uncertainty associated with the use of Modifying Factors and Uncertainty Factors in the development of chemical toxicity values for Carcinogens and also the average 10%+ error commonly associated with reporting analytical data findings at the time. As an environmental professional and a Connecticut resident, I hope that CTDEEP continues to evaluate risk-based decision making beyond what has been presented in this report for the Remediation Program. Other critical aspects of the Remediation Program such as short term exposure risks (significant environmental hazards) were not evaluated. However, the report serves as a good launching point, although more needs to be done.

Sincerely,

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