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Detour or Road Map? DEEP's Risk Based Decision Making Assessment Study Report and What's Next for the Remediation "Transformation" Process

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For several years, the Connecticut Department of Energy and Environmental Protection has been engaged in an ambitious effort to revamp the way the state remediates contaminated sites. Under the banner of "transformation," DEEP convened stakeholder meetings in 2011 and 2012 to ponder challenges ranging from the types of sites that fall within regulatory scrutiny to options for streamlining site closure and transition of myriad existing programs to a "unified" release-based system. DEEP has attempted to integrate the results in increasingly detailed conceptual expressions of a future remediation system. In a state challenged by the brownfield legacy of its industrial past – a challenge magnified by the cost, delay and uncertainty associated with current approaches to site characterization and remediation – this effort is of vital interest.

On August 29, 2014, DEEP released "Evaluation of Risk-based Decision Making," a report intended to be taken into account in framing legislative proposals due in October 2014. But the very genesis of this "RDM Report" sheds light on the challenges facing the transformation process – and its conclusions reflect the competing priorities that must be reconciled, both in program and implementation, to achieve true "transformation."

Origins: the Significant Environmental Hazard Controversy of 2013.

The RDM Report was mandated by a legislative compromise late in the 2013 General Assembly session – a compromise that emerged from the ongoing transformation process as it stood at the time.

By November 2012, DEEP had made clear in concept that in a unified release-based system, any new release or discovery of historical contamination would trigger affirmative obligations. This represented (and would still represent) a dramatic departure from existing law, under which such obligations arise in limited circumstances – for example, upon transfer of properties or businesses classified as "establishments" under the Transfer Act, or upon discovery of contamination classified as a "significant environmental hazard." Because of the increased volume of regulated releases, not least the potential influx of historically contaminated "brownfield" properties, DEEP's concept also involved expanding remedial options to expedite and simplify compliance, for example by allowing tiered closures tied to a range of exposure and use scenarios. In short, expanded reporting obligations would be matched by streamlined, flexible "off ramps."

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These concepts did not advance to proposed legislation in the 2013 session. But DEEP did introduce a proposal analogous to the expanded reporting component of the emerging unified system. Senate Bill 1082 included a provision that would have reduced the reporting threshold for the "significant environmental hazard" ("SEH") program, Conn. Gen. Stat. § 22a-6u, under which discovery of contamination triggers affirmative reporting and mitigation obligations. In particular, subsection 22a-6u(d) sets the threshold for certain substances at levels greater than thirty times those defined by the Remediation Standard Regulations ("RSRs"), R.C.S.A. § 22a-133k-1 *et seq.* In S.B. 1082, DEEP proposed to reduce the threshold to a factor of ten under some circumstances. Though not integral to emerging "transformation" concepts, this proposal would have had a similar effect in expanding the universe of sites subject to regulation. DEEP actually presented this as a benefit to human health and the environment.

There ensued what might diplomatically be termed a vigorous discussion about whether sound risk assessment science justified the change and the resulting burden on regulators and the regulated community. The result was a two-part compromise in Public Act 13-308:

- Sections 31 and 32 of P.A. 13-308 set forth a scaled-back expansion of the SEH program that lowered the threshold to factors of ten and fifteen, but under narrower circumstances than originally proposed. This requirement the final Act deferred to 2015 – two full years after adoption.

- Section 28 of P.A. 13-308 directed DEEP to engage outside experts to conduct an independent review of risk-based decision making. This implicitly acknowledged the unsettled technical foundation of the SEH proposal. The bill directed DEEP to conduct the review by August 2014 and to report to the legislature in time for the 2015 legislative session – before the SEH changes took effect.

The RDM Report: Six Characters in Search of an Author?

The resulting RDM Report provides a thoughtful, thorough discussion of risk assessment concepts, in general and in site remediation processes and programs. From this foundation it derives six broad recommendations:

1. Improve integration of risk assessment with site remediation by transferring responsibility for human health and ecological risk assessment to DEEP from the Department of Public Health.

2. Expand opportunities for property owners, local governments and other stakeholders to present nonstandard, locally-supported remedial solutions.

3. Document assumptions, models, exceptions and other aspects of RSR criteria, expand criteria to protect soil invertebrates and plants as well as public health, and grant DEEP authority to revise criteria without legislative approval.

4. Adopt ecological risk assessment and management models based on Massachusetts and British Columbia programs.

5. Improve use of advanced site-specific risk assessment where application of default RSR criteria may be inappropriate.

6. For carcinogenic contaminants, adopt risk management goals based on "reasonably maximally exposed individual" (RMEI) up to 1 in 100,000 per chemical and up to 1 in 10,000 per site, versus 1 in 1,000,000 cancer risk.

The third, fifth and sixth recommendations go the heart of the scientific or technical basis for RSR criteria, which serve both to drive remediation obligations and to define "how clean is clean" – and will continue to do so in any "transformed" program.

In this sense, recommendation 6 is of particular interest: it poses a challenge to ask not simply "how clean is clean," but "how clean is clean enough." Explicitly or not, this challenge is central to any remediation framework – and setting an unnecessarily high bar carries real costs. As the RDM Report notes, "strict reliance on RSR default criteria [may lead to] site actions that are wasteful of resources and not likely to produce actual improvements in public health or ecological health." [RDM report, page 1-7] The most trenchant risk assessment statement in the RDM Report thus may be the one explaining this recommendation: "For the vast majority of contaminated sites, the size of the affected population is small, the risks are theoretical, and the concatenation of conservative assumptions inherent in risk assessment methods results in intentionally, but too often extremely, worst case estimates." [1-7] The report elsewhere elaborates that "the numbers of people who would be reasonably maximally exposed at a local site cannot be in the millions or tens of millions," so "allowable individual risk estimates .. should not be as stringent as 10^{-6}." [6-24]

These comments give form to the impression, prevalent in at least some quarters, that the daunting expense of dealing with brownfield properties is at least in part the product of overly conservative risk assumptions underlying the numerical RSR criteria. They provide a tantalizing hint that sound risk assessment has the potential to improve the way Connecticut approaches site assessment and remediation without compromising real protectiveness.

Despite this hint, the RDM Report largely does not apply these concepts to systematic analysis of Connecticut's current or contemplated remediation program. Instead, it takes a more ad hoc approach.

With regard to numerical criteria for direct exposure to contaminants, it compares Connecticut and Massachusetts criteria for 78 compounds both states regulate. Finding 18 identical and 62 within a factor of

five, the report concludes that Connecticut's criteria "are not systematically more or less conservative." [3-12] The report approves the formulas DEEP uses to derive direct exposure criteria for carcinogenic and non-carcinogenic compounds, but notes that DEEP overstates risk by inappropriately summing adult and child exposures in the non-carcinogenic residential risk scenario. [3-13 to 3-15]

For pollutant mobility criteria, the report observes that the RSRs implicitly assume a worst case in which a given level of contamination supports an equilibrium groundwater concentration over an arbitrarily large area. But "[a]t many sites, actual soil contamination is not enough to sustain the[se] assumptions," with the result that remedial measures can be "unnecessarily over-protective and highly cost-ineffective." Conceptually, the report notes that greater site-specific flexibility could be achieved by refining formulae and assessing actual pollutant mobility by direct measurement of groundwater concentrations. [3-16 to 3-17].

These evaluations are perhaps most noteworthy for what they do not do. Benchmarking comparisons with other jurisdictions shed no light on the objective risk assessment justification of existing criteria. Comments on numerical standards reflect ways of thinking about how RSR criteria are derived and imply that many should be rethought, but this is only the starting point for such an analysis. The RDM Report does not attempt a systematic risk-based evaluation of the numbers.

With respect to Connecticut's existing remediation framework overall, the RDM Report similarly relies on a benchmarking methodology developed for the purpose. The methodology is both thoughtful and provocative: it uses ten distinct attributes of remediation programs along with numerous sub-attributes as the basis for "scoring" and then ranking programs in Connecticut and other jurisdictions. On this basis, the Connecticut framework "scores" in the middle of the pack. But only some of these attributes involve risk assessment considerations. Others measure effectiveness and implementability in practice, the scoring and ranking are qualitative, and the methodology overall, however interesting, is ad hoc. To take only one example, it weights all ten attributes equally in the scoring. Highlighting this point at the public information session on September 10, 2014, staff of DEEP's contractor observed that a policy decision to give greater weight to some attributes would alter the scoring.

Perhaps the most striking omission is evaluation of the SEH program. The RDM Report mentions it only with the tautological observation that it and a contemplated category of "imminent hazards" involve "sites posing risks of an urgent nature that, thus, would dictate a correspondingly urgent response." [3-3] But it provides no technical evaluation of the threshold of "urgency" for the new, more stringent SEH reporting threshold – or, for that matter, for the existing "thirty times" threshold.

So Where Were We: On the Road Again Toward Transformation?

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In the multi-year trek toward "transformation," delivery of the RDM Report concludes a detour precipitated by the 2013 SEH controversy. The question now becomes how this new information can or should influence development of a reimagined remediation framework.

In a sense, this question presents the dilemma of the square peg and the round hole. The report relates to the subject matter of the transformation process but does not map to its themes or particulars. This of course reflects its genesis in a legislative directive related only tangentially to the ongoing "transformation" process.

The concepts laid out in the RDM Report nevertheless seem highly relevant to the ongoing "transformation" process. The report itself acknowledges that the contemplated "release-based" program will "capture a broader set of sites or release areas (both new and historical)." [3-2] Plainly a larger volume of sites can be processed if standards and modes of implementation focus more sharply on achieving meaningful protection of human health and the environment. The report provides a valuable frame of reference for deciding what is "meaningful" – and conversely, what is unnecessary – on the basis of sound risk assessment.

But these same points also embody a pervasive tension in any dialogue about remediation, which is where and how to strike an appropriate balance on protectiveness. This tension was at the core of the controversy over the 2013 SEH proposal. It exists within the formal structure of a program, in ways the RDM Report discusses and that have been part of the ongoing transformation discussion. And it recurs in a dimension no regulation can fully address, which is how a remediation program is implemented in practice.

In this crucial respect, the RDM Report sets a potentially revealing test by proposing that sound risk assessment principles would justify setting acceptable cancer risks at a level of one in 100,000 or even one in 10,000. This proposal is the opposite of the 2013 SEH proposal. The latter was based on a judgment – apparently subjective, for all that appears in the legislative record – that if a 30-times threshold is protective, a 10-times threshold must be more protective. The former requires a technically grounded policy decision that while 10^{-6} cancer risk may be protective, 10^{-5} or even 10^{-4} would be adequately protective under proper circumstances. In other words, property meeting the resulting criteria would be "clean enough."

Such decisions are pervasive in implementing a remediation program. A particularly fraught example in Connecticut environmental practice is deciding whether site conditions have been adequately defined by investigation. This decision requires professional judgment about when conditions are adequately understood. But even working within DEEP's "Site Characterization Guidance Document," reasonable minds can differ about whether additional investigation will meaningfully improve the quality of information and resulting remedial decisions. The reasonable minds at DEEP incline toward more investigation and greater certainty. The reasonable minds in the regulated sector often consider less exhaustive investigation sufficient for the purpose and proportional to the context.

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Such choices also play out in the Licensed Environmental Professional program, which permits private consultants to oversee and approve many site investigation and remediation decisions. But the reasonable minds of LEPs are caught in the crossfire between the clients who pay the freight and the regulators whose audit power can jeopardize their livelihoods. LEPs are prone to channel the hypothetical "most conservative DEEP staff" and shrink from choices actual DEEP staff might accept. To the extent remediation mechanisms rely on private resources to move sites along, the resulting frictions impair effective function.

These observations suggest that sound risk assessment concepts – including proportionality and willingness to accept "enough" – should inform decisions at all levels of a remediation program. That begins with the structure of the program and the initial setting of numerical cleanup criteria and standard exceptions, but continues through every step of implementation down to line staff and licensed professionals. The converse is equally apparent: resistance to accepting "enough" can cripple the most elegantly conceived program – and could frustrate the achievement of the kind of genuine "transformation" all seem to agree Connecticut needs.

The End ... Or Is It?

The RDM Report concludes a specific task the General Assembly set for DEEP. Though off the main sequence of the ongoing transformation process, it has the potential to inform and elevate that process. Its six major recommendations make sense and bear consideration. Its ten attributes of best practices could serve to screen and refine proposals for a unified system.

Beyond these obvious particulars, the concepts embodied in the RDM Report point the way to a broader sort of "transformation." Risk assessment orientation can improve the fit between remedial actions and the real risk presented by contamination. A program built and implemented on sound risk assessment principles could enjoy the confidence of property owners, regulators and the public. In a "transformed" framework, "clean enough" need not be a dirty word.

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