Final Report to the Connecticut Department of Energy and Environmental Protection

on

# Evaluation of Finish Lines and How Risk and Other Factors Influence Closure

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Submitted to Support the Comprehensive Evaluation and Transformation of Connecticut's Cleanup Laws

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# Workgroup Membership

Workgroup 2 on the evaluation of finish lines and how risk and other factors influence closure consisted of sixteen members.

**Workgroup 2: Evaluation Finish Lines and How Risk and Other Factors Influence Closure.**

| Participant | Representing |
|---|---|
| Camille Fontanella (co-lead) | Connecticut Dept. of Energy and Environmental Protection |
| Kelly Meloy (co-lead) | ALTA Environmental Corporation |
| Ann Catino | Halloran & Sage, LLP |
| Gary Cluen | GZA GeoEnvironmental, Inc. |
| Matthew Coldwell | NewFields |
| Maurice Hamel | Connecticut Dept. of Energy and Environmental Protection |
| Meg Harvey | Connecticut Dept. of Public Health |
| Nicholas Hastings | Woodard & Curran, Inc. |
| Eric Henry | Kleinfelder, Inc |
| Kevin King | Environmental Resources Management |
| Lauren Levine | United Technologies Corporation |
| Martin Mador | Sierra Club - Connecticut Chapter |
| Jessie McCusker | GEI Consultants |
| Mark Mitchell | CT Coalition For Environmental Justice |
| David Sherman | Apex Companies, LLC |
| John Wertam | Shipman & Goodwin, LLC |

# Executive Summary

The workgroup evaluated environmental site closure under Connecticut's current cleanup programs, including the time needed to reach site closure, factors that influence the time needed, how interested parties rely on closure, and if the current finish lines meet their needs / expectations. To conduct this evaluation, the workgroup was divided into four subgroups to explore the four general themes: (1) factors influencing site closure; (2) interested parties to site closure; (3) achieving more expedient site closure; and (4) the current state of site closure in Connecticut compared to other states' programs. Each group performed an evaluation of its assigned issue and developed recommendations for improvements to defining closure. Ultimately a set of common themes emerged and these themes and the recommendations that follow are clearly applicable regardless of how such programs are accessed. In addition, the workgroup discussed whether there was consensus on the issues raised.

Connecticut has many cleanup programs: the Property Transfer Program, the Voluntary Cleanup Program, the Leaking Underground Storage Tank (LUST) Program, the Significant

Environmental Hazard Program, the Solid Waste Program, the Resource Conservation and Recovery Act (RCRA) Corrective Action, the PCB Program, the Potable Water Program, and the Brownfields Program (of which multiple programs exist administered jointly by multiple agencies). Closure for some of these programs is achieved through compliance with the Regulations of Connecticut State Agencies, Sections 22a-133k-1 through 22a-133k-3, called the Remediation Standard Regulations (RSRs), but not all programs are subject to the RSRs. As a result, uncertainty exists regarding how and whether the various closure programs dovetail.

In addition, certain of the cleanup programs may be implemented by a Licensed Environmental Professional (LEP). The LEP program was established in 1995, in part due to recognition by the General Assembly of limited Department of Energy and Environmental Protection (DEEP) staff resources, and to provide greater efficiency and timeliness to regulated parties attempting to reach site closure. However, the LEP program has not evolved over time into a fully privatized program and, instead, is quite dependent upon DEEP involvement. In part, the lack of LEP independence is because the RSRs do not always present a clear roadmap to the finish line. For example, DEEP review and approval is required for alternative site-specific criteria, technical impracticability variances, widespread polluted fill variances, ecological risk assessments, and engineered and institutional controls.

Remediating sites in Connecticut is a complicated undertaking involving technical complexities, physical site impediments, legal hurdles, financial and business factors, historical site use and reuse considerations, regulatory and statutory mandates and interpretations, public policy considerations, public involvement and the protection of public health, safety and welfare. DEEP becomes involved by necessity and in accordance with state statutes and regulations. DEEP involvement provides certainty to the investigation and remediation activities proposed by the LEP and certainty to the regulated community performing the cleanup (in terms of acceptability of the LEP's work and judgment, cost projections, and minimizing the likelihood of a negative audit outcome). DEEP involvement bolsters the public trust, but DEEP resource limitations can slow the time it takes to achieve site closure.

When closure in accordance with the RSRs is required under a cleanup program, it is essentially bifurcated into two categories of property depending upon how that property is used or will be used: residential and commercial/industrial. However, such bifurcation does not necessarily fit all sites. The site use of certain "residential" properties may actually be more characteristic of commercial/industrial sites, and flexibility for this is not currently built into the cleanup programs in such a way where DEEP involvement is not required. Other factors also influence remedial decisions and a framework needs to be established to address these factors in a uniform way. For example, risk assessments are a powerful, yet underutilized tool, in determining whether contamination presents a real risk to public health and to the

environment. In addition, multiple exit pathways would allow closure of certain contaminated areas on a site, even if the entire site remains under investigation/remediation or a new release occurs.

Other states have developed programs that offer a wider variety of finish lines. Alternative pathways with different finish lines can provide a better chance of closure. Massachusetts, New York, New Jersey and Pennsylvania all provide different pathways based upon exposure (risk) scenarios. While other states have established milestones and time frames, deadlines established for the Connecticut cleanup programs are few. Establishment of more milestones may provide more opportunities for public involvement and comment during the course of the investigation and remediation. Establishing additional milestones may also help DEEP to track progress towards site closure and make progress more visible to the public. Many other parties may be interested in the progress of a remediation, such as adjacent landowners, community organizations, and the municipality, but under the existing system, the opportunity for comment at certain milestones are not well understood and may be limited.

While the workgroup consisted of various interested parties, the themes above were acknowledged, albeit in varying ways, by all the subgroups. Common recommendations based upon these themes took shape. Some highlights are as follows:

- Endpoints should:
    - Be better aligned with the current and future risk presented;
    - Address other categories of end-use beyond residential and commercial/industrial;
    - Exist at various stages of remediation (e.g., by release area);
    - Be flexible to permit closure of areas when a new release occurs;
    - Address incidental releases in a more uniform manner (e.g., impacts from petroleum hydrocarbons or polynuclear aromatic hydrocarbons [PAHs] from roads/parking lots);
    - Realistically account for aquifer viability and legacy properties (those affected by urban fill, pesticide contamination and contaminated sediments based upon watershed);
    - Allow an alternate path for existing and active properties when significant exposure pathways have been addressed until a change in use or change in ownership occurs; and
    - Permit closure for sites with stable groundwater plumes.
- General Permits should be developed to standardize the approval process for commonly used types of engineered controls.

- Guidance documents should be developed that describe an option(s) that is acceptable to DEEP as to how an issue may be addressed. Where available, DEEP should utilize and take advantage of EPA research and source documents (i.e., the EPA risk assessment guidance) to aid in risk-based decision-making and enhanced self-implementation of site cleanup by LEPs.
- Business and financial considerations must be a factor in the remediation, schedule and timeliness of approvals.
- Public monies should be made more readily available to areas where contamination may be widespread and where jobs may be created and/or retained.
- Options for institutional controls, land use restrictions and activity and use limitations beyond the existing Environmental Land Use Restriction (ELUR) scheme should be explored – particularly in areas of historic impacts. The ELUR process itself should be simplified to overcome processing delays and issues presented by inability to obtain subordination agreements.
- Balance technical achievability and cost with human health/environmental benefits.
- Develop meaningful timeframes and provide for a transparent process and public involvement, potentially with public information sessions at various remedial milestones.
- Develop a searchable, public website database that provides information including all environmental reports and DEEP approvals/notices so that a database of information is developed that can inform the regulated community. Provide DEEP with the authority to procure the development of the website.

Getting to the finish line can be challenging under the current Connecticut cleanup framework. A better road map will provide certainty to the regulated community, and allowing more flexibility as to the way in which cleanup is achieved under various scenarios will provide the regulated community to more easily navigate and achieve site closure in a is cost- and time-effective manner, while still providing protection of human health and the environment.

# Introduction

## *Evaluation Background*

The cleanup of pollution and redevelopment of Brownfields and other environmentally-degraded properties is critical for Connecticut. The benefits of such cleanups are significant and include protecting human health and the environment from the effects of pollution, creating opportunities for economic development, and aiding in efforts to make our cities, towns and villages more sustainable.

While Connecticut was ground-breaking to initiate strong human health and environmental protections to address pollution, a significant top-to-bottom review of our current cleanup laws and the framework they create has never been conducted. Significant changes, additions, and improvements have been made to the cleanup laws since the late 1960s, but changes have been incremental and selective. This draft workgroup report is part of an on-going Comprehensive Evaluation of the cleanup laws for the State of Connecticut. DEEP intends to use this Comprehensive Evaluation to aid in the transformation of the cleanup laws. A successful transformation of the cleanup laws will create a system of cleaning up contaminated properties that is efficient and effective for the broad array of stakeholders that rely upon the safe reuse of Brownfields and other environmentally-degraded properties.

## *Scope and Deliverable*

The Workgroup was provided with the following scope and deliverable by DEEP:

Scope: Evaluate the current requirements for closure (what is the finish line) under the various Connecticut cleanup programs. Document and evaluate the factors that influence the time needed to reach investigation and remediation closure, evaluate how risk and other factors influence when closure is achieved, and evaluate how interested parties rely on closure and whether current finish lines meet their needs or expectations.

Deliverable: Present information from this evaluation and discuss ways that closure could be obtained more quickly while meeting the needs and expectations of interested parties.

DEEP explained that the Workgroup should strive to address the scope and deliverable, and other related topics could be addressed if time permitted. Further, DEEP stressed that all related topics requiring additional evaluation that were related to this scope and deliverable should be documented in this draft report.

## *Subject Matter Background*

A variety of remediation programs exist in Connecticut with varying endpoints and ways to achieve site closure. Achieving completion of environmental site closure under Connecticut's remediation programs can be a lengthy process and endpoints can be unclear and difficult to reach. As a result, closure for many sites has not yet occurred and monies continue to be expended to reach a goal that may not be attainable in a time frame commensurate with the risk.

The goal of this workgroup was to identify and evaluate factors that affect reaching the finish line of site closure and to provide recommendations / solutions on how closure can be reached

in a more expedient, certain, efficient and effective manner, while still being sufficiently protective of human health and the environment. Additionally, the workgroup recognized various constituencies that are served by these programs.

The privatized LEP program was created in 1995 to reduce the significant DEEP backlogs in review and approval of investigation and remediation activities at regulated sites in Connecticut. The LEP program was designed explicitly to expedite completion of remediation of these regulated sites with oversight of such investigation and remediation activities vested in the LEP in lieu of DEEP. The workgroup therefore also evaluated the effectiveness of the privatized program in the context of the RSRs, and the degree to which they are self-implementing.

## Workgroup Meetings and Format

Beginning on August 24, 2011 and ending on September 28, 2011, Workgroup 2 met six times to discuss the scope and deliverable with which they were tasked. Each meeting is summarized in the table below.

**Workgroup 2: Meetings and task summary.**

| Meeting | Date (Time) of Meeting | Task Summary |
|---|---|---|
| 1 | August 31, 2011 (2:00 – 4:00 PM) | DEEP co-lead explained the scope and deliverable, roles of participants, and ground rules for participation. The second co-lead and the secretary-of-the-day to record meeting minutes were selected. The scope was discussed. Workgroup 2 decided on our overall approach: divide into five subgroups. |
| 2 | September 6, 2011 (1:00 – 3:00 PM) | The secretary-of-the-day was selected to record meeting minutes. The scope was re-divided into four subgroups (subgroups 1 and 2 were combined). Workgroup 2 discussed each subgroups' findings and decided upon the addition of evaluations of findings for the next meeting. |
| 3 | September 15, 2011 (2:00 – 5:00 PM) | The secretary-of-the-day was selected to record meeting minutes. Workgroup 2 discussed refinements to subgroup's findings and decided upon the addition of solutions for findings and the completion of subgroups' summaries for next meeting. |
| 4 | September 21, 2011 (1:30 – 3:30 PM) | Subgroup reports were finalized and the workgroup began discussing the overall report. |
| 5 | September 26, 2011 (11:00 AM – 1:00 PM) | The workgroup wrote sections of the Executive Summary, Discussion, and Appendices in the report. |
| 6 | September 28, 2011 (9:00 AM -12:00 PM) | The workgroup finalized the report. |

The general approach of Workgroup 2 was to divide the scope into four subgroups, which were tasked with addressing different aspects of the scope. Each subgroup contained three to four non-DEEP members. The two DEEP members provided support and feedback to each subgroup. Assignments were made during the Workgroup 2 meetings and were carried out in the intervening time between each meeting. An electronic exchange of information was continuous between members of each subgroup. The first four meetings were reserved for the overall presentation of each subgroup's efforts and discussion of the work product between members of the entire Workgroup 2. (Subgroup members are listed in the table below.) Meetings 4 through 6 were reserved for drafting the report.

**Workgroup 2: Subgroup members.**

| Subgroup Area | Members |
|---|---|
| 1. / 2. Factors Influencing Site Closure | Kelly Meloy (co-lead), Lauren Levine, Meg Harvey, Matthew Coldwell [Camille Fontanella (co-lead), Maurice Hamel] |
| 3. Interested Parties to Site Closure | Martin Mador, Mark Mitchell, Gary Cluen, John Wertam [Camille Fontanella (co-lead), Maurice Hamel] |
| 4. Achieving More Expedient Site Closure | Eric Henry, Kevin King, Ann Catino [Camille Fontanella (co-lead), Maurice Hamel] |
| 5. Current State of Site Closure in CT and Other States | Nick Hastings, David Sherman, Jessie McCusker [Camille Fontanella (co-lead), Maurice Hamel] |

The Workgroup 2 meetings were well attended, with an average of 80% attendance at each meeting. Teleconferencing was available and utilized when needed. Some subgroups met or held teleconference discussions outside of the Workgroup 2 meetings listed above. Meeting minutes, a summary of tasks discussed during the meeting, and future meeting agendas were distributed via electronic-mail after each meeting. Meeting minutes were recorded for the first three meetings (Appendix A). In meetings 4 through 6, the workgroup wrote several sections of the report which required consensus and input from the entire workgroup. The minutes for meetings 4 through 6 were not recorded, since the work conducted during these meetings consisted of drafting the reports.

## Areas of Evaluation

Workgroup 2 decided that the overall scope was too large to address as a whole and that there were four areas that could be addressed by groups of three to five individuals working together. The findings for each sub-topic are presented below:

## *Areas 1 and 2. Factors Influencing Site Closure*

Subgroup 1 / 2 was tasked with outlining factors that influence the time needed to achieve site closure under CT's current remediation programs and evaluating how these factors influence the pathway toward site closure.

Twelve factors, listed and described below in no particular order of importance, were identified as influencing the time needed for site closure:

1. **Technical Complexity –** Complex sites generally take more time to investigate, evaluate feasible remedial options, and implement the selected remediation methods. These may include sites with multiple release areas, contaminated media that are more difficult to remediate (e.g., groundwater, sediment), media that are heavily contaminated (e.g., dense non-aqueous phase liquids [DNAPL]), and/or off-site investigations and remediation (e.g., migrating groundwater plumes, ecological risk). Complex sites often require sequencing of various remedial measures over a number of years. These complex sites also are more likely to need permits from multiple regulatory agencies and involve significant financial and personnel resources), which extend the time to achieve site closure. Where off-site impacts exist that warrant investigation and remediation, the project timeframes may be extended (see legal issues below) and add another layer of complexity regarding access, cost, degree to which the remedy will mitigate potential risks to human health and the environment, and whether the cost leads to measurable and permanent benefits.

2. **Risk Protection Endpoint -** The sensitivity of a receptor group and the exposure scenario to which a cleanup is tied, such as the consumption of drinking water and residential exposure to soil, may impact the length of time to achieve site closure and, in some cases, may not be representative of the current or proposed exposure scenario for a particular site or may make it technically impracticable to achieve. Some examples impacting time to closure are listed below:
   - In aquifers designated as high quality (GA classification), groundwater must be remediated to background or to levels protective of consumption (groundwater protection criteria [GWPC]), even if there are currently no consumers of such groundwater, nor any future plans to utilize the aquifer for drinking. The "background" endpoint is not strictly risk-based, but is more aligned with protection of the aquifer as a current or future resource. The consumption endpoint is based on a very sensitive exposure scenario. Both endpoints are very stringent, not necessarily aligned with the current or foreseeable use of the groundwater for drinking purposes, and can be very time consuming to meet. In some cases these stringent groundwater standards cannot be feasibly met. The RSRs specify circumstances in which variances from groundwater remediation standards (including the GWPC) can be sought, but the need for DEEP approval of such variances can also extend the time to achieve site closure (see #3 below).

- The use of residential soil cleanup standards is the default approach for recreational sites, schools and universities, apartment complexes and condominium complexes and other comparatively lower-intensity uses, which do not align with current or foreseeable future uses that guide the sensitive exposure assumptions on which the residential cleanup standards are based. The RSRs allow for development of alternative standards using less sensitive exposure scenarios, but the approval process for such standards can also extend the time to achieve site closure (see #3 below).
- In the case of total petroleum hydrocarbon (TPH)/ extractable TPH (ETPH), current remedial standards are not risk based and are difficult and in some cases are impracticable to meet.
- The qualitative (narrative) remediation standards for DNAPL ("contained or removed to the maximum extent prudent") and light non-aqueous phase liquids (LNAPL) ("removed to the maximum extent practicable as defined by the implementing agency") are not consistently interpreted by DEEP, LEPs, and the regulated community. Because these qualitative standards are not clearly linked with a risk protection endpoint, this often results in increasing the time to closure. A technical impracticability variance is provided under the RSRs, but the need for such additional approval also adds to the remediation timeframes (see #3 below).

3. **Need for Regulatory Agency Approvals or Permits** – Permit and other regulatory approvals can result in significant project delays and routinely increase the timeframe needed to reach site closure. Common DEEP approvals necessary for site remediation include:
   - Environmental Land Use Restrictions;
   - Engineered Controls;
   - Alternative Remediation Standards, such as site-specific criteria and other compliance methods;
   - Ecological Risk Assessments (where necessary);
   - Remediation of polychlorinated biphenyls (PCBs) subject to DEEP requirements and EPA regulations; and
   - Other local, state and federal approvals or permits (e.g., remediation in wetlands or wetland buffer areas; wastewater discharges; remediation-related chemical injection; solid waste permits for urban fill consolidation).

4. **Technological, Chemical, and Physical Limitations** - Technological, chemical, and physical limitations can slow and even prevent attainment of site closure. Examples of such situations may include:
   - Impacted groundwater where stringent remediation standards are applicable but are often unable to be met due to physical/chemical limitations, commonly related to soil permeability, chemical solubility and adsorption to aquifer materials;
   - The presence of non-aqueous phase liquids (NAPL) in soil and/or bedrock;
   - Proximity to existing structures (e.g., undermining building, footings or other structures); and

- Risk of unintended consequences, including increased exposure risk and contaminant mobilization, as a result of remediation.

5. **Legacy Considerations -** Characterizing and mitigating sites containing historic urban fill, agricultural residues and/or involving ecological risk and sediment concerns routinely involves significant additional timeframes to reach consensus on an appropriate remedial approach and site closure endpoints. In addition, addressing such legacy concerns commonly presents issues for properties beyond the one that is subject to the regulatory framework. The following are examples of common legacy considerations:
   - Historic urban fill, consisting of lawfully placed soil containing such materials as asphalt, coal, coal ash, wood ash, concrete brick, glass and ceramics is commonly found at many urban sites. Most often, such fill poses potential risks associated with direct exposure to the fill, yet only a small percentage of sites containing such urban fill are regulated under current Connecticut remediation programs. The RSRs include provisions for fill that are feasible though quite expensive and not self-implementing, requiring DEEP review and approval.
   - Pesticide and herbicide residuals are commonly found at historic agricultural properties, where these chemicals were generally lawfully (and in accordance with the manufacturers' recommendations) applied at the time. Again, a small percentage of such sites are being regulated under Connecticut remediation programs. Certain current risk-based standards in the RSRs (e.g., the GA PMC for soil in particular) cannot be feasibly met for many sites impacted with pesticide residuals, and thus achieving site closure for these types of sites is comparatively difficult.
   - The investigations and cleanups associated with ecological risk are more time consuming to implement and sometimes technically impracticable to achieve, primarily due to the complexity of the issue and the lack of DEEP guidance on completing ERAs and evaluating appropriate risk management options. For instance, sediment impacts often stem from a variety of current and/or historic contributors, including both point and non-point source discharges with numerous potentially responsible parties. There is widespread consensus among the variety of stakeholders, including scientific experts and other state and federal regulatory agencies, that the only effective and efficient means to address such impacted sediment is on a watershed basis, with watersheds prioritized for evaluation and mitigation based on degree and extent of current impacts and sensitivity of current ecological receptors.

     Under current Connecticut cleanup programs, only a small percentage of regulated sites are subject to ecological risk-based remediation. Remediation efforts at those sites are often not effective over the long term due to recontamination of sediments. This site-specific approach commonly results in a minimal long-term environmental benefit at significant costs to the small number of regulated sites required to undertake such work.

6. **Financial Considerations -** In brief, remediation requires money. To determine how much money, certainty regarding the parameters of the cleanup is required. Economics and

financial considerations must be effectively balanced with remediation goals that are sufficiently protective of human health and the environment but at the same time provide flexibility in addressing the potential risks associated with the wide variety of sites. Financial considerations play a very important role in selecting new sites for development and redevelopment. Contaminated sites are a significant frustration to owners and potential developers if the cost of cleanup is unknown and/or far outweighs the fair market value of the property (in a remediated condition). While oftentimes dollars invested in the remediation come from cash flow, cash flow alone may be (and usually is) insufficient. If the remediation is concurrent with a redevelopment that will lead to new revenue for a company, conventional financing may be available if the business risk and risk to the lender can be managed. Monetary issues can be a primary factor on whether a contaminated site successfully navigates the remediation process and how long it takes to do so.

7. **Business Considerations -** Environmental issues are only one facet of business decisions regarding property transactions and redevelopment. Decisions related to contaminated property purchases or expansions are driven by the marketplace and include factors beyond environmental cleanup (e.g., access to highways, rail corridors, utilities and customers). However, the uncertainty associated with remedial costs, business interruption, and use/expansion opportunities, whether an owner/new purchaser can understand the parameters of the cleanup, whether exit ramps exist, the extent of perceived and actual liability and the degree of risk remain key considerations. Business considerations, demands of the marketplace, and property transactions can lengthen or shorten timeframes to reach site closure. Some examples of business concerns affecting time to achieve site closure include:
   - Planned private party transactions (difficulties associated with lending, refinancing, and negotiating purchase/sale agreements – especially on sites with multiple Transfer Act filings when prior certifying parties are not performing);
   - Proposed redevelopment and/or redevelopment potential – location, degree of impairment, availability of alternative sites;
   - Business priorities and available cash flow (e.g., consideration of risks posed by different sites, and allocation of resources given potential risks); and
   - Operations-driven restructuring.
8. **Site Use and Reuse Considerations -** Site reuse is driven by economic factors. Liabilities associated with contaminated properties can create a disincentive for redevelopment. There is often more certainty, especially in relation to costs and liability, in developing uncontaminated land than in remediating and redeveloping contaminated sites.

   Active sites have the additional problem posed by potential disruption of operations that may take place during the investigation and remediation process. It can be difficult to accurately investigate and remediate release areas beneath an active factory, warehouse, or other commercial structure without causing significant financial hardship to the property owners and employees, including potential temporary shutdowns. Some of these issues can be addressed by institutional and/or engineered controls, when existing contamination

remains beneath a structure and exposure risk can be satisfactorily evaluated and abated by preventing such exposures.

Some examples of site use/ reuse that may affect the timeframe for achieving site closure include:

- Challenge associated with developing risk endpoints when end use is not defined
- Lack of new owner/developer interested in reuse or redevelopment potential
- Active operations causing need to postpone investigation/ remediation in portions of facilities

9. **Statutory or Regulatory Deadlines –** Currently, there are limited cleanup programs, such as those listed below, that contain statutory deadlines for achieving final site closure:
   - For properties subject to the Transfer Act after October 1, 2009, deadlines exist for completion of investigation, initiation of remediation and completion of remediation; whereas for prior transfers, the first two deadlines apply, but there is no deadline for completion of remediation.
   - For properties subject to the Transfer Act after July 1, 2007, deadlines exist for DEEP audits of LEP verifications.
   - Site-specific deadlines exist for active sites under DEEP consent order to complete investigation and remediation in accordance with established schedules.
   - Deadlines exist for regulated units with regulatory schedules (e.g., regulated USTs under Federal-equivalent UST regulations, hazardous waste management units subject to RCRA closure).
   - For sites subject to RCRA Corrective Action, there are EPA priorities and goals associated with demonstrating site stabilization and achievement of final remedies with deadlines for closure milestones.
   - For Significant Environmental Hazards, there are notification timeframe requirements, and follow-up response action deadlines are set on a case-by-case basis to abate the hazard condition.

   Sites in cleanup programs not listed above may extend over longer timeframes because there are no deadlines. Overall, the lack of deadlines to achieve site closure results in a longer timeframe to achieve site closure. There is a current lack of incentives to promote expeditious cleanups and a lack of disincentives to discourage sites that languish.

10. **Legal Issues -** The existence of the types of legal issues listed below can significantly increase the timeframe it takes to complete site investigation and remediation and reach site closure:
    - Property access issues and ongoing lawsuits;
    - Multiple site transfers with multiple certifying parties over time;
    - New releases areas associated with on-going operations and with separate responsible parties;
    - The obligations of a Certifying Party under the Transfer Act sometimes do not align with the scope of the LEP's verification. The conflict arises in at least two scenarios: First,

differing obligations arise relating to on-site soil or NAPL contamination resulting from an off-site release if such contamination exhibits exceedances of the soil or NAPL remediation standards. Second, a site may also have impacts not caused by the certifying party and that may occur after a certifying party has sold the site or that are not a result of the certifying party's operations. The law requires a certifying party who files a Form III under the Transfer Act to certify as follows: "…to remediate pollution caused by any release of a hazardous waste or hazardous substance from the establishment in accordance with the remediation standards" (Conn. Gen. Stat. §§ 22a-134(12)). In contrast, the definition of "verification" under the Transfer Act states that the LEP verify "…that the establishment has been remediated in accordance with the remediation standards" (Conn. Gen. Stat. §§ 22a-134(19)). The LEP's obligations relating to the verification is interpreted by DEEP to encompass on-site remediation of contamination. Final site verification, therefore, cannot occur until all releases (regardless of source or timing) have been remediated in accordance with the RSRs. This conflict can preclude certifying parties from final closure through a LEP verification; and

- Difficulty in obtaining subordination agreements needed in connection with ELURs (e.g., from some lenders, some utility companies).

11. **Political Considerations and Community/Public Interest** – High interest in a site and its visibility in the public eye can impact cleanup timeframes; community concern or acceptance could slow or accelerate cleanup. The primary concerns of third parties typically revolve around two major issues: 1) the current and future risk of human exposure to contaminants, and 2) economic concerns (i.e., jobs, property values, and tax revenue). In addition, a perceived lack of transparency may lead to a lack of trust in the remediation process.

12. **Public Policy Consideration** – Several public policy issues commonly arise that affect final closure of sites. Examples include:

    - In 1995, the Connecticut General Assembly authorized the development of the Licensed Environmental Professional (LEP) Program, in part to relieve the burden on DEP staff and resources to oversee the remediation of all sites. The LEP Program was created to allow for self-implemented cleanups on the majority of regulated site cleanups, with regulations and benchmarks guiding that cleanup to be established by DEEP. DEEP resources were to be directed more toward the sites that pose the greatest risk to public health and the environment. Currently, the program has not developed into a fully self-implemented program, as DEEP approvals are often required to practically achieve site closure. In addition, the LEPs often must seek interpretative guidance from the DEEP based, in part, on regulatory uncertainty, and in other part, on site conditions. In conclusion, the program has not evolved into a fully privatized program with DEEP staff resources transitioning to a more robust auditing function. The public, however, remains concerned that there is a sufficient level of DEEP oversight of the LEP Program.

- Factors that are not provided for in any statute or regulation include: (a) balancing the cost of remediating the property that is subject to regulation against the overall risk and long-term environmental benefit; (b) whether the incremental benefit afforded by achieving strict closure under the regulations is cost-effective; (c) balancing a site-by-site approach with an area approach that incorporates and balances risk; and (d) the availability of public funding.

- Availability of funding sources is key to remediation. In the case of highly visible, high-risk sites, and/or those with a new redeveloper, local, state or federal funds and tax incentives may be available to conduct investigation and perform remediation. However, these funding sources are not as readily available to existing property owners unless a significant business expansion, including job creation, is planned. Funding is generally not available to property owners/responsible parties if no business expansion is planned. Traditional, conventional financers are hesitant to lend to such projects with contaminated property, especially in the case where the investigation is not yet completed, the extent of remediation is not known and, therefore, the cost of remediation cannot be quantified within an acceptable range of certainty and business risk.

## *Area 3. Interested Parties to Site Closure*

Subgroup 3 was tasked with evaluating how interested parties rely on site closure and gathering information on which milestones fulfill such parties' needs and expectations, including achievement of ultimate site closure (finish line). This task was re-framed to answer the question: What information is necessary to each type of interested party to understand the issues and provide meaningful input into the cleanup process, and at what milestones should such information be provided along the way until achievement of site closure?

In order to facilitate the analysis, a matrix was developed (see below) that identifies types of interested parties (rows) and various milestones typical of a project requiring remediation (columns). The parties were evaluated that would need to be informed of the various milestones included in the matrix. As the matrix indicates, information about a site remediation project must have clarity and certainty before being announced. Certainty pertains to the accuracy of the information provided, which may require some level of DEEP concurrence or LEP certification; and clarity pertains to the fact that the audience needs to be able to understand the risks or lack thereof or a timeline by which those risks will be defined. The following identifies the issues and general conclusions:

Regarding the matrix, it is presumed that the identified milestones are relatively generic with respect to sites that might enter a remediation program and/or be identified as requiring remediation. These milestones were generally compiled from a combination of Connecticut

Property Transfer Act and RSR requirements; although, other programs with milestones (see the Underground Storage Tank Cleanup Program) might be considered. We therefore did not attempt to break down each of the remediation programs identified by DEEP's January 2011 white paper, but determined that the ultimate goal of the visioning process would result in a single remediation framework that could encompass all sites, and therefore, the proposed milestones would be universally applicable.

Interested parties may be broken down into different categories based on their interests and perspective. For example, buyers and sellers, property owners, potential developers, and lenders all have a financial and legal interest in achieving closure of a site. Neighbors have an immediate interest due to the proximity of the site to their residence. Community organizations, municipalities, and the public have an interest in what effect the site may have on the environment and their health. Community organizations and local government have a general accountability to resident health and well-being, not only at the time of cleanup but also in future years. In addition, a municipality also is interested in maintaining (and growing) the property as an active contributor to the tax base in the town and insuring that the property does not fall into disrepair, become blighted or abandoned. Finally, a fourth type of interested party includes state and federal regulators. The distinction between categories of interested parties may only be important in terms of what information is provided, how it is provided, and at what point in the process it may it be available. However, there are several common goals of site closure among all parties: to expeditiously achieve a clear end point for site closure in a manner in which all parties have an opportunity to provide input, can rely upon information provided along the path to the ultimate solution, and have confidence that the approach used is protective of human health and the environment.

**INTERESTED PARTIES AND MILESTONE MATRIX**

| **INTERESTED PARTIES:** | **MILESTONES** | Entry into Remedial Program (2) | Stabilization of any emergency/ acute (short-term) risk *Note:* Some sites require status reports be given to the public. | Phase II completion | Protection of receptors (control current risk to human health) | Completion of Investigation (Final Phase III) | **Proposed Remedial Action Plan (1)** | Final Remedial Action Plan | **Completion of active remediation on site (1)** | ELURs or other institutional controls | Completion of MNA and post-remedial monitoring | Stabilized Site with Monitoring & Maintenance | Verification Report Filed | Completion of Audit process (3) | DEEP/EPA No Further Action (3) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Group 1 - Buyers, Sellers, Property Owners, Developers, Lenders | | X | X | X | X | X | X | X | X | X | X | X | X | X | X |
| Group 2 - Neighbors | | | X | | | | X | | X | X | | | | | |
| Group 3 - Community Organizations and Municipalities | | | X | | X | | X | | X | X | | X | | | |
| Group 4 - State Regulators and Federal (EPA Region I) | | X | X | | X | X | X | X | X | X | | X | X | X | |

Notes: 1) Bold milestones are primary and all groups should be provided active notification and meaningful public input.

2) Other milestones are important to one or more of the groups but not all. Posting of achievement of the milestone on a web based system is expected and notification (indicated by an "X") should be made (e.g., via e-mail) to certain groups.

3) These milestones are considered "Terminal" and indicate the end of remedial obligations for the responsible party.

**Primary and Secondary Milestones**

Site investigation and remediation milestones were divided into "Primary" and "Secondary" categories (primary categories are bolded), with a "terminal" milestone being the final action necessary to release a site from further remedial action. Primary milestones are related to what investigative and remedial actions have been proposed and when they have been completed. These milestone engage all types of interested parties and involve, among other elements, public meetings or information sessions, meaningful public input including an opportunity for review and comment, participation by the responsible party class, and governmental or LEP oversight and/or approval. Secondary milestones involve interim steps toward site closure. Currently, this secondary milestone information is not readily available for all parties to access, which may be important to certain stakeholders to define responsibilities, demonstrate and communicate progress, and identify where releases have occurred and what areas may need to be remediated to achieve compliance.

**Analysis**

What is clear from the existing remediation programs at DEEP is that many of the suggested milestones or information associated with them is not easily accessible to a variety of the parties. A primary concern expressed within this subgroup was that public participation in remediation activities in Connecticut is lacking. Seeking public participation is required under current state environmental statutes and regulations at certain points in the process. Although most remediation activities may not be of interest to the public, communities are often very concerned about remediation at specific sites where there might be threats to health, safety or the natural environment. When given the chance, neighbors and community organizations often express concern about not knowing when and how to find out about, understand and engage in decisions about contaminated property cleanups. Additionally, there appears to be a lack of public certainty regarding primary milestones and demonstrating a project's progress toward site closure. Finally, our review is limited to identifying only "who" and "why" such information would be posted at the various milestones, but not the content of that information or "what" and "how" it would be posted.

## ***Area 4. Achieving More Expedient Site Closure***

Subgroup 4 was tasked with identifying and describing ways in which site closure could be achieved in a more expeditious manner, including the consideration of differing exit pathways versus one exit pathway for different CT cleanup programs. Seven issues were identified; these are described below:

1. **Difficulty of Investigating and Remediating Active Facilities -** With the issuance of the Site Characterization Guidance Document (SCGD), Reasonable Confidence Protocol guidance and continuing education requirements for LEPs focused on a uniform interpretation of the

standard of care for investigating a site, extent and availability of an owner's financial resources are now the greatest influence on the pace of getting a site through the investigation process and onto the remediation stage. For example, if a company has the resources available and decides to budget $25,000 or $250,000 a year for environmental investigation/remediation and elects to forego buying new equipment, it is prepared to spend that amount on environmental cleanup in that year. Business decisions to budget dollars for environmental remediation are often driven by the availability of the dollars and conscious choices given the business goals. In both scenarios, regulatory decisions have to be made to accommodate the availability of resources.

However, active sites can also pose unique challenges to completing investigation or remediation. For instance, intrusive investigation at operational facilities can require relocation of equipment or work areas, protection of equipment or items being manufactured, completion of subsurface utility location surveys, and/or use of specialized drilling equipment to access a tight area. Remedial work may only be able to proceed during plant shut down periods, which means that remediation may take years to implement. Otherwise, normal operations may be interrupted which can affect jobs and the company's ability to serve its clients/customers. Finally, many operations have regulatory, operational, safety, product quality or other factors that make investigation very difficult. In many cases, investigation and remediation activities in active facilities can experience significant delays and involve premium costs.

2. **Need for DEEP Approvals on LEP-lead Sites Can Delay Closure Process -** There are several circumstances where closure in accordance with the RSRs requires the LEP to prepare a document for review and approval by the DEEP. The lack of technical guidance and adequate DEEP resources can lead to more prolonged DEEP review times. LEAN efforts can reduce review and approval times, but delegating some decisions to LEPs may make sense in certain situations. Specifically these situations include, but may not be limited to:

   - *Alternative Criteria and Criteria for Additional Polluting Substances:* The RSRs contain risk-based, numeric remediation standards that were conservatively developed so as to be widely applicable to all sites in Connecticut and self-implementing provisions that allow for development of site-specific criteria that are still sufficiently protective of human health and the environment but more reasonable in light of site-specific considerations. Beyond the self-implementing provisions, which do not exist for all environmental media, alternative site-specific, risk-based criteria are subject to DEEP review and approval, in consultation with the DPH. A similar process applies to obtain approval of criteria for substances not currently included in the RSRs. The current approval process is lengthy, controversial, and highly uncertain.

- *Urban Fill:* Historic urban fill presents several difficulties. Such fill generally requires obtaining DEEP review and approval to remediate under variances provided in the RSRs, which can cause delays in achieving site closure. Given the small percentage of site regulated under Connecticut remediation programs, the requirement to remediate such historic fill at these sites and not at many surrounding, similarly impacted properties presents an inequity and represents a significant public policy concern. Additionally, for "widespread polluted fill", which is a subset of this universe, it can be difficult under the current RSRs to demonstrate that such impacted fill is widespread due to the need to document the presence of "widespread polluted fill" on contiguous properties is difficult due to access issues and the inequitable application of remediation on sites affected by polluted fill if adjacent sites are either not in Transfer Act or not subject to any legally required investigation or remediation.

- *Asphalt:* Remediation of soil containing asphalt from roads and other remnants of parking lots commonly involves significant additional cost with no reduction in risk, especially since a common remedial measure is to cover such areas with new asphalt pavement.

- *Engineered Controls:* Such institutional controls are allowed under the current RSRs with DEEP approval and may require a review, comment, and approval process that can delay site remediation.

- *Environmental Land Use Restrictions (ELURs):* ELURs have been standardized through a LEAN process to some degree, but the results of the process have not yet been practically experienced and concern remains as to the length of time needed for DEEP review before ELUR approval. Additionally, the need for subordination agreements in the ELUR can add a significant amount of time, complexity, uncertainty and possibly prevents closure if the utility or other party refuses to enter into a subordination agreement. The opportunity for public input is also considered by some to be insufficient.

- *Soil Reuse:* Placement of impacted, yet RSR compliant, soil on another parcel requires DEEP review, which can cause delays in completing site remediation. Limited DEEP staff resources can delay such approvals which can be especially difficult on sites where construction and/or remediation are underway.

- *Ecological Risk Assessments (ERAs):* The need for and adequacy of ERAs are site-specific, to be determined by either the LEP or the DEEP, with the exception of sites regulated under RCRA CA that are required by federal law. For those sites where it is necessary to complete an ERA, obtaining DEEP approval presents one of the largest bottlenecks in CT remediation programs, primarily due to the lack of clear criteria, DEEP guidance, and DEEP staff resources to review each ERA. Responsible parties widely express trepidation

regarding the ERA process, as they regularly encounter new issues or seemingly aggressive remedial requirements in comparison to federal and other state jurisdictions. The CT regulated community does not have confidence in the predictability of the timing of the ERA process or the certainty as to when and how it may apply to a site. The subparagraph in the RSRs that gives DEEP the authority to notify a regulated party of the need for an ERA presents a source of uncertainty with regard to timing during environmental site work. LEPs report varying approaches by the regulated community where some of them prefer to wait until DEEP affirmatively requires an ERA while others proactively undertake ERAs. Currently, there is a lack of guidance in this area to determine when, where and how to perform such ERAs. There also appears to be significant variation in ERA expertise amongst LEP's.

3. **Difficulty meeting GWPC and Groundwater Monitoring Timeframes -** Anecdotal data suggests that many site closures are stalled at the post-remediation monitoring phase. This issue is comprised of two elements. The first element is the length of the monitoring required to demonstrate compliance. The RSRs specify timeframes (dependent on groundwater classifications) needed to demonstrate compliance with the applicable groundwater criteria. These timeframes unnecessarily delay site closure. The second element occurs where constituents in groundwater have been reduced to steady-state levels, but at concentrations that stubbornly remain above GWPC or background, preventing compliance with the RSRs. The inability to reduce contaminant concentrations to meet the numerical Ground Water Protection Criteria (GWPC) is difficult to achieve. In some cases technologies may be available to reach compliance, but doing so may not be economically feasible. Years of groundwater monitoring of steady-state plumes is commonplace and should be addressed. The RSRs allow for DEEP approval of discontinuation of monitoring and a technical impracticability variance, but the need for DEEP approval of these variances adds uncertainty and the need for a variance increases the time to achieving site closure (see Areas 1, 2, and 3).

4. **New Releases / Contamination Resulting from On-going Operations –** Efforts, specifically with Public Act 11-141, have been undertaken to clarify the scope of required investigation and remediation activities at active sites (with the potential for new releases by other parties) so that the investigation and remedial obligations of the Certifying Party are more clearly delineated after their Transfer Act filing. The overall intent is to affirm that newly created areas of concern are the responsibility of the new owners/operators and that these areas should not need to be addressed to support a LEP verification on behalf of the Certifying Party. This change does provide relief from remediation of releases created by others, but some raise the concern that ambiguity still may exist as to whether all releases must be investigated before remediation. This places an additional burden on the certifying party as the parties responsible for the other AOCs have no incentive to complete investigation at that time. If the Certifying Party wants to get to the remedial phase, they

must undertake the investigation responsibilities of others or enforce other parties' obligations through other means (e.g., filing a lawsuit). In some cases the added burden influences the Certifying Party to delay investigation until the other parties participate.

5. **Expanding the Usability of ELURs and Alternate Mechanisms-** ELURs can be difficult to implement in some cases due to difficulties with obtaining the required subordination agreements. Spill cleanups and responses to significant environmental hazards may benefit from the use of ELURs. The existence of ELURs may not be recognized by parties who, for example, do not have easy access to check Town land records and DEEP files before contracting site improvements which may disturb restricted areas.

6. **Remedial Obligations for Historical Pesticide/Herbicide Impacts -** Numerous remediation sites (or sites attractive for redevelopment) are located in areas where past agricultural activities have left pesticide residuals above RSR criteria. DEEP and DPH have partially addressed these situations with guidance that allows for a variety of risk-based remedial options; however, these options are difficult to implement under the RSRs. Remediation and redevelopment of many former agricultural sites have been stalled from by the presence of these types of contaminants.

7. **Consideration of Differing Exit Pathways for Different State Cleanup Programs Versus One Exit Pathway for a Variety of Cleanup Programs -** In comparison with CT cleanup programs, several responsible parties have noted that managing sites in other states, such as New York, frequently involves the assessment of the pros and cons of proceeding through one of several different remedial programs mostly because the programs have significantly divergent cleanup obligations. Such an analysis frequently considers criteria that limit or prevent a Site's access to certain programs even though the remedial options in that program may be desirable. Other states, such as Massachusetts, close out release areas on a release area basis.

   Furthermore, site closure, or attainment of compliance with the RSRs, can only be achieved under a formal remediation program (and, if a potential historical solid waste disposal area is involved, under the solid waste regulations as well). If a property is regulated by a remediation program, the RSRs form a framework that sets criteria for two categories of cleanups: residential and industrial/commercial. If these cleanup criteria are uniformly applied, regardless of the program of origination, the project objectives are clear.

   However, a "two-size-fits-all" approach can present issues for the process and application of the RSRs. Other programs involving site cleanup fall outside of the jurisdiction of the RSRs (spills, LUSTs, and significant environmental hazards) and default to DEEP approvals of scope and/or closure on a case-by-case basis. Uncertainty may arise during the cleanup of such non-RSR sites because the criteria for cleanup and closure are not well defined, yet these sites may eventually come into a remediation program. If that occurs, releases areas may be revisited, and resources would need to be allocated to re-evaluate them, which is

not cost-effective. Solid waste closure of disposal areas (e.g., farm dumps) also requires additional permitting under solid waste programs and may involve long-term closure requirements that differ from the RSRs.

Many parties responsible for remediating sites have expressed concern that limited DEEP involvement at the critical investigation and remediation phases of the project increases the chance that, upon verification, DEEP will require additional investigation and/or remediation should an audit of the LEP's work be conducted. Anecdotally, the significant improvement in the understanding of the standard of care by DEEP and LEP's has reduced this concern, but it is still a major issue on sites with potential ecological impacts.

## *Area 5. Current State of Site Closure in CT versus Other States*

Subgroup 5 was tasked with summarizing the current state of achieving site closure under CT's remediation programs and contrasting that with how site closure is achieved in other states.

The first step of this summary identified eight existing CT remediation programs; these include the Spill Compensation and Control Act, Property Transfer Program, Voluntary Cleanup Program, Significant Environmental Hazard Program, UST regulations, RCRA Corrective Action, Potable Water, and PCB Program.

A detailed examination of the closure strategies defined or available (or not defined and unavailable) under the various CT cleanup programs was not performed by this workgroup. The summaries, conclusions and recommendations detailed in Areas 1 through 4 of this report offer sufficient insight into the current state of achieving closure under the various CT remediation programs.

Various other state and federal programs were reviewed by group members in order to select a subset for more detailed evaluation. The process of achieving closure under the CT remediation programs identified above was compared to the following state and federal programs:

- Pennsylvania Code (Title 25)
  http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_program/10307/_statutes___regulations/552036
  http://www.pacode.com/secure/data/025/chapter250/chap250toc.html

- New Jersey Industrial Site Recovery Act, Environmental Cleanup Responsibility Act
  http://www.state.nj.us/dep/srp/

- Massachusetts Contingency Plan (310 CMR 40.0000)
  http://www.mass.gov/dep/cleanup/laws/mcptoc.htm

- 6 NYCRR PART 375 Environmental Remediation Programs
  http://www.dec.ny.gov/about/627.html
  http://www.dec.ny.gov/docs/remediation_hudson_pdf/part375.pdf

- RCRA Corrective Action
  http://www.epa.gov/osw/hazard/correctiveaction/

A summary comparing the CT cleanup programs to the programs evaluated by this workgroup are provided in the Table: *"Area 5. Current State of Site Closure in CT and Other States: Program Comparison Table"* (see Appendix C). Specific details pertaining to these state and federal regulatory programs can be found via the websites provided above.

In comparison with Connecticut, other states, such as Massachusetts and New York offer different types of end-point options. Whereas CT generally allows for only Residential or Industrial/Commercial end-use scenarios, MA's program consists of a wider range of receptor-based options that pertain to the current and foreseeable (10 year) risk. NY also offers a wider variety of use-based endpoints in their remediation programs.

In CT, timeframes for cleanup are only applicable to a narrow set of projects and interim milestones are similarly not applied (or routinely enforced) across all programs. In MA, environmental activity is initiated based on a defined concentrations or a threshold quantity for a given release. There is a five-year time-frame for cleanup of an individual release area, with established milestones and strict penalties for non-compliance. The goal at each site is to achieve background conditions or a permanent solution, called a Response Action Outcome. There are well-defined finish lines with RPs paying annual compliance fees each year until closure. The MADEP can and does audit at any time during the cleanup, and auditing of a site's cleanup can occur more than once. In New York, environmental activity is initiated based on reported releases, historic listings, or entry in a brownfield program. There are site-specific timeframes for cleanups, including specific brownfield program cleanup timeframes. Pennsylvania offers a program which encourages voluntary cleanup and brownfields development by using clear guidelines, endpoints and incentives. In addition, PA has entered into an agreement with EPA which states -"Any clean up that satisfies Act II requirements also provides exemption from action by the EPA".

In general, other states evaluated for this study appear to have a wider variety of finish lines for different end-point uses, which put sites into different remediation tracks and cleanup categories. In CT, the LEP program is intended to expedite the process, but other states have similar programs that seem to have greater autonomy for those that are licensed. The balance with less regulatory oversight is achieved through issuance of guidance, training for environmental professionals, and use of a robust audit/enforcement process.

# Recommendations

Each subgroup provided recommendations to address the issues that were identified in achieving site closure.

## *Recommendations for Areas 1 and 2: Factors Influencing Site Closure*

Recommended potential solutions for each factor influencing the achievement of site closure are listed and described below. These recommendations suggest ways in which these factors may either become non-issues or the ways in which the time it takes to resolve these issues may be reduced.

1. **Technical Complexity –** Although it is difficult to resolve many of these issues, recent Brownfields legislation (Public Act 11-141) has eliminated some of the above complexity for certain sites relating to releases which have migrated off-site by eliminating the requirement to investigate or remediate such off-site impacts for certain eligible sites. Such solutions could be broadened or expanded upon. Solutions pertinent to ecological risk assessment and NAPL issues are addressed under Items 2 (Risk Endpoint) and 5 (Public Policy Considerations) below. If additional regulatory or statutory deadlines are to be considered (e.g., in connection with Item 9 (Statutory or Regulatory Deadlines) below), technically complex facilities should be specifically considered during such regulation or statute development. It is recommended that the deadlines be varied, dependent on size and complexity of the site being investigated and remediated.

2. **Risk Protection Endpoint -** Different finish lines exist for different remediation programs in Connecticut. It is suggested that a greater variety of risk protection endpoints that are more closely aligned with current and foreseeable future uses and risks be provided. Possible solutions include:

    - The remediation of sites that fall into the current RSR "residential" category, but that are not used strictly for residential purposes (e.g., recreational sites), would benefit from development of default risk-based standards that take into consideration the less frequent and intensive exposures associated with such land uses. Provide separate closure endpoints to address current and reasonably foreseeable future risks, including clear milestones to demonstrate to the public that current exposures and risks are under control.
    - Refine aquifer classifications and groundwater remediation standards for GA/GAA areas to incorporate different closure endpoints and pathways based upon consideration of such factors as aquifer yields and quality, current and reasonably foreseeable groundwater uses, and use of institutional controls to eliminate the contamination pathway to potential drinking water receptors. Evaluate mature programs from other states (including Massachusetts and New Jersey) and EPA. Develop risk-based guidance to facilitate achievable groundwater cleanups, including such topics as Technical

Impracticability variances, development of alternative risk-based criteria, alternate compliance methods, groundwater classification/reclassification based on yields, quality and uses, and use of institutional controls to maintain elimination of potential drinking water receptors.

- Institutional controls are essential to ensure maintenance of certain land uses and to allow activities consistent with the selected remedial approach, which is critical to provide protection from future risks. Evaluating a greater variety of institutional controls and adopting models that have been successfully used elsewhere, including Activity and Use Limitations (AULs, as implemented in Massachusetts), restrictions consistent with the Uniform Environmental Covenants Act (UECA, as implemented in Pennsylvania), zoning design districts (e.g., Hamden's Newhall site) and permitting databases (e.g., Stratford's Raymark site), should be explored. The controls put in place need to be available and accessible to the public, transparent, and enforceable.
- Provide more end-use, risk based standards, and a self-implementing process for development of alternative risk-based standards (similar to MA). One options would be to adopt the U.S. EPA risk assessment guidance for use in developing site-specific, risk-based remediation standards, as well as remediation standards for additional polluting substances (as detailed below under Item 3).
- Provide guidance for the NAPL remediation standard which better aligns remediation to risk protection endpoints. There is a need for consistency between programs and guidance because the endpoint is unclear.
- In establishing new and/or different risk-based endpoints (especially any that are more stringent than existing standards), develop a transition plan to ensure that release areas already remediated under existing standards or release areas where active remediation is already underway, are appropriately grandfathered. Certainty is important.

3. **Need for Regulatory Agency Approvals or Permits -** Modification of the areas where the privatized LEP program is not currently operating in a privatized (self-implementing) manner (similar to MA), would involve further development of the DEEP auditing process of LEP verifications. Furthermore, in modeling other States' programs (including MA, NJ and TX) that have followed this type of approach, DEEP will need to adopt guidance on certain additional topics, as detailed below:

   - Allow for self-implementing development of risk-based remediation standards by LEPs, including use of site-specific risk assessments. To do so in a consistent, protective and scientifically defensible fashion, we recommend that DEEP adopt the federal EPA guidance on human health and ecological risk assessment that is widely accepted as being protective using current and sufficiently robust science, which scientific methods have been independently peer reviewed by numerous internal and external qualified experts (including from other EPA programs and other federal agencies), and accepted through consensus by the various stakeholders following a lengthy and interactive development process. Such guidance has been adopted by many other states in the country according to the Interstate Technology and Regulatory Council. Furthermore, EPA has successfully applied its risk assessment guidance process and methodology for many years at many sites in the Superfund and RCRA programs. Connecticut's past

proposals to adopt risk-based approaches that vary significantly from the federal approach have consistently involved more stringent approaches, and have led to repeated failures due to concerns regarding the scientific defensibility of such proposals, and whether an appropriate balance had been reached between sufficient environmental protection and adverse economic impact.

- Allowing LEP-approved ELURs (akin to current allowance of such for LEP-lead sites under Voluntary Remediation Program in GB areas and similar AUL approach in MA).
- Given the extensive experience with historic urban fill in Connecticut commonly posing potential risks associated with direct exposure and DEEP approvals to date of certain common types of engineered controls to restrict direct exposure to such fill, we recommend that DEEP formally adopt such existing types of engineered controls for statewide use (e.g., in regulation or by General Permit) at eligible sites.
- Improve the DEEP audit process to increase its robustness. This may involve specialized training of existing staff and/ or addition of specifically qualified staff.

4. **Technological, Chemical, and Physical Limitations -** Potential solutions include:

    - Consider aquifer classification/reclassification, alternate remediation standards, alternate compliance methods and points of compliance (similar to EPA and MA) to develop an appropriately protective groundwater remediation and compliance approach that is feasible and that considers such factors as groundwater usage (current and reasonably foreseeable), groundwater availability, and potential use of institutional controls.
    - Improve or revise the process for obtaining Technical Impracticability variances by issuing appropriate guidance and streamlining the process to improve the clarity and certainty associated with such variances.
    - Expand use or types of institutional controls, as warranted, to eliminate exposure pathways for plumes not able to be sufficiently mitigated to meet existing groundwater remediation standards.

5. **Legacy Considerations -** Potential solutions include:

    - Consider whether to continue to regulate and require remediation of historic urban fill (not required by MA) and/or develop feasible self-implementing methods for remediation of historic urban fill (see Item 3 above). If remediation will be required, allow for LEP use of pre-approved remedial approaches for historic urban fill posing potential risks by direct exposure only.
    - Clarify that the DEEP/DPH policy (regarding soil mixing) for former agricultural sites may be used for sites subject to the Transfer Act and other Connecticut remediation programs. Consider alternative compliance approaches for former agricultural sites, due to the inability to feasibly meet current RSR remediation standards (e.g., most commonly associated with but not limited to the GA PMC for soil).
    - Adopt substantive guidance (similar to EPA) for completing human health and ecological risk assessments and evaluating appropriate risk management options, acknowledging that such impacts are routinely due to a number and variety of current and/or historic contributors and numerous potentially responsible parties.

- Consider addressing impacted sediments on a watershed basis (similar to EPA and other state programs), with watersheds prioritized for evaluation and mitigation based on degree and extent of current impacts and sensitivity of current ecological receptors. A site by site approach commonly results in a minimal (if any) long term environmental benefit but a significant cost to the small number of regulated sites required to undertake such work. Focus resources on most impacted water bodies. Establish earlier milestone of determining which sites need eco-risk and which do not. More guidance on risk-management decisions and comparison to benchmark criteria.

6. **Financial Considerations -** Potential solutions include:

   - Acknowledge that progress is directly related to financial issues and that addressing any imminent hazards is a way to handle significant risks until better financial times.
   - Work with the State and Federal Government to make more public monies available to perform remediation at higher priority sites.
   - Provide decisions in a timely manner if a company is eager to move forward and has allocated the resources to accomplish the cleanup. Consider fees for expedited approval.
   - Provide education and certainty to lenders with respect to remediation endpoints to facilitate lending and investment for contaminated sites.

7. **Business Considerations -** Potential solutions include:

   - An improvement in the economic cycle leading to an overall increase in property values will likely make remedial projects become more economically feasible. The business bottom line and potential adverse impacts on jobs must be considered.
   - Applying ideas like the Targeted Brownfield Remedy could limit investigation costs and disruption on all sites and potentially make remedy implementation more feasible and therefore likely to be done.
   - Increase economic incentives and regulatory relief programs to incentivize redevelopment of contaminated (brownfield) sites versus choosing to develop previously undeveloped sites.

8. **Site Use and Reuse considerations -** Potential solutions include:

   - Provide more types of ELURs, with greater transparency, accessibility to public, and better enforcement (see #3 above).
   - Provide clear endpoints so that property acquisition, use, development and expansion decisions can be made with some certainty.
   - Develop risk-based decision-making criteria for LEPs.

9. **Statutory and Regulatory Deadlines** - Imposition of additional regulatory/statutory deadlines could serve to expedite cleanups for sites not currently under any such deadlines. It is suggested that additional deadlines be established in conjunction with a programmatic

structure that allows for self-implementing, LEP-lead oversight with a more robust DEEP audit program (similar to MA). Potential solutions include:

- Expand tracking of progress towards deadlines and potentially new interim milestones.
- Increase enforcement on recalcitrant parties.
- Acknowledge that a "one-size-fits-all" set of deadlines will not work.
- Create incentives for more timely progress towards site closure (e.g., tax credits, liability relief).
- Create disincentives for lack of progress, such as an assessment of annual fees for sites until site closure is reached (similar to MA) and categorization of sites by risk level that would be downgraded as acute and/or significant chronic risks are mitigated and the site moves closer to no further action being warranted (similar to NY).

**10. Legal Issues -** Potential solutions include:

- Consider revising the definition of "verification" under the Transfer Act to be consistent with certifying party obligations by adding the language included below in italics: "Verification" means the rendering of a written opinion by a licensed environmental professional on a form prescribed by the commissioner that an investigation of the parcel has been performed in accordance with prevailing standards and guidelines and that *pollution caused by any release of a hazardous waste or hazardous substance from the* establishment has been remediated in accordance with the remediation standards;
- Attempt to clarify rules of which party is responsible for which contamination, especially with sites that have undergone multiple property transfers with multiple certifying parties.
- Consider adopting an alternative ELUR-type mechanism, an activity and use limitation (AUL) mechanism (similar to MA), and/or other state models that are more consistent with the Uniform Environmental Covenants Act (UECA).

**11. Political Considerations and Community/Public Interest - Potential Solutions:**

- Consider the need for increased public involvement for certain high visibility sites or sites where significant local interest or concern is expressed during the already-required public notice and comment periods (similar to EPA Region 1 RCRA corrective action process), to assuage public concerns, identify legitimate concerns that were not addressed by the remediation plans, demonstrate transparency, and increase the public trust. These actions may include:
  - Early involvement of local government.
  - Production and distribution of fact sheets/comment forms describing site conditions, proposed action, and a list of significant documents pertaining to the site (Phase 1, 2, 3 Reports, RAP, etc.).
  - Providing an electronic copy (usually on a CD) of important documents to the local public library so that they may be readily accessed by interested parties, until an internet database is available.
  - Perform a public meeting at key milestones.

**12. Public Policy Considerations –** Potential solutions include:

- If DEEP (and the legislature) seek to develop a fully privatized (self-implementing) system (potentially similar to MA, NJ, and TX), then the goal of such system must be aligned with new regulations and guidance developed by DEEP such that the program is truly self-implemented. Further development of the DEEP auditing process (and the alignment of resources necessary to perform auditing) of LEP verifications under the privatized program would be necessary. Public confidence would also be enhanced through the development of clear regulations and an audit program, whereby the work of the LEP could be audited by DEEP.
- Create clear statutory authority to allow for two types of analyses, as may be applicable: (a) a cost/benefit analysis that would allow for balancing the cost of remediating the property against the overall risk and long-term environmental benefit and (b) balancing the benefit associated with undertaking remediation on a site-by-site basis with the continued risk that exists resulting from offsite areas.
- Provide accessible funding sources (grants, loan guarantees, tax incentives) to provide financial resources, which are key to conducting and completing remediation.

## *Recommendation for Area 3: Interested Parties to Site Closure*

Currently, outside of the parties undertaking the work, information concerning environmental issues and progress being made toward site cleanup is not easily accessible to other interested parties. Better information availability to all parties might provide opportunities for meaningful input by others and thereby result in a greater certainty in the ability to manage risk and make informed decisions, regardless of the type of interested party. The following recommendations are offered:

1. Provide a web based system for all stakeholders to access information about the milestones. Notifications about attainment of certain milestones (see matrix) could be sent via e-mail to interested parties, with information on where the information can be accessed for review. The system information concerning the milestones needs to be kept current (e.g., updated weekly). In recognition that all interested parties may not be computer literate or have access to electronic mail, the current public notification requirements of posting of signage, notification in local newspapers or mailings to certain parties may still be necessary at primary milestones.

2. Define and develop meaningful public input for primary milestones. This may go beyond the typical 30-day or 45-day public notice period and involve public participation meetings in certain circumstances, especially where interest in a certain site has been expressed. Information in such a case should also be available in the local library for review.

3. Establish reliable, verifiable and approved information at established milestones in order to make reasonable determinations about the status of site progress towards

closure. There should be some level of DEEP review at the primary milestones, such that all parties can have confidence that the primary milestone has actually been met, rather than just a report has been submitted. Parties need to be able to rely upon the information provided and that work on a site actually meets the milestone.

4. Greater public participation in remediation activities in Connecticut may be warranted in certain circumstances, such as with contaminated sites located near residences, day care centers, large aquifers, or other sensitive receptors. This will help to achieve the following:

    - Greater protection of human health on the site, currently and in the future;
    - More informed decision-making about the site by neighbors and other interested parties throughout the process and into the future;
    - More acceptable outcomes that might limit community opposition that could slow down or stop the cleanup process;
    - Increased community support for expenditure of public funds for clean up and redevelopment of properties;
    - Development of the properties consistent with that of neighboring properties; and
    - Greater public confidence and acceptance in the remediation process, and of the role of LEP's in the process.

Exactly what information and how it would be made available, this group did not determine. Current public participation processes and procedures should be evaluated to understand adequate levels of public participation which would make the public participation process more meaningful, workable, and balanced. Amendments to the current public participation process should be developed with input and advice from all appropriate stakeholders. While this group did not attempt to outline a procedure and process for meaningful public input, it is vital that any remediation program do so and make provisions for adequate funding for public education and engagement. We recommend a separate group be established for that discussion.

## *Recommendation for Area 4: Achieving More Expedient Site Closure*

Recommendations for ways in which site closures could be achieved more expeditiously are described below, including some ideas in which differing exit pathways for different programs might also expedite site cleanup.

1. **Difficulty of Investigating and Remediating Active Facilities –** Possible solutions include:

- An alternate path (similar to the recently proposed Targeted Brownfields Remedy) could allow active facilities to minimize the intensity of the investigation to ensure that significant

exposure pathways have been addressed (examples include off-site VOC plumes, non-compliant SWPC plumes discharging to water bodies, impacts to drinking water wells and VOC vapor entrainment to occupied buildings) to protect workers and the public while minimizing operational impacts.

- Consider approaches for expedited site investigation (e.g., EPA's Triad Approach), which allow for more rapid investigation and, therefore, are more easily budgeted by businesses.
- An interim timeline could be allowed for active facilities by creating a milestone that indicates that current exposure to humans is under control similar to the Environmental Indicators published under RCRA Corrective Action. Completion of a Sensitive Receptor Survey would be critical under this option. This option would be predicated on current use of facility. Changes in use, including termination of operations, would trigger re-evaluation of potential exposures or investigation in accordance with prevailing standards and guidelines. This could also create a progress milestone in the program toward eventual satisfaction of the RSRs that would be useful to the public.
- Development of an alternate path and interim timeline (as discussed above) for sites that are not abandoned, but are undergoing a sale that will change the use of the facility, provided that the new use is not residential, a school, day care or other similar sensitive use. For example, an alternate path could be used for commercial/retail sites with large areas of impervious surface that serves as a cap.
- For sites with multiple release areas (whether active or inactive sites), upon completion of an investigation on a release area basis, allow for verification and auditing of individual or groups of release areas. Such a process would provide certainty and finality as to that release area(s) which would be useful for a certifying party where the area may be in use by another party.
- Prompt and/or expedited decision making by DEEP (when DEEP approval is needed) such that meaningful financial planning can occur.

2. **Need for DEEP Approvals on LEP-lead Sites Can Delay the Closure Process –** Possible solutions include:

- *Alternative Criteria and Criteria for Additional Polluting Substances:* DEEP and DPH have been working on improving the approval process/turn-around time through LEAN. Consider further streamlining the process for the use of approved site-specific criteria more broadly (state-wide) as part of any review request rather than the current process of requiring submission of calculations to justify the use of "new" criteria for every site.
- *Urban Fill:* A regulatory solution to address urban fill in urban areas and fill in non-urban areas that has been impacted by historical filling is suggested. Education is also warranted for the community to understand the issue and to provide assurance that the remedy will be protective of public health. The urban fill workgroup, consisting of DEEP staff and external stakeholders, is evaluating best practices and regulatory solutions to address this issue, in addition to developing guidance.
- *Asphalt:* Develop a standardized approach for addressing the presence of petroleum hydrocarbons and/or polynuclear aromatic hydrocarbons that are residuals of degraded asphalt, maintenance of paved surfaces, or parking of motor vehicles, given the common past remedy for such areas being addition of new pavement.

- *Engineered Controls:* Standardization of approval process for commonly used types of engineered controls, such as General Permits, and improvements to the approval process/turn-around time through LEAN. Further guidance and standardized application forms from DEP will help to expedite approvals.
- *Environmental Land Use Restrictions (ELURs):* The LEAN process for ELUR review has been completed, and a more streamlined application process is currently being developed by DEEP. Development of an alternative approach for subordination agreements or an alternative institutional control, such as a Notice of Activity & Use Limitation (similar to MA) or the adoption of uniform environmental covenants is suggested. To address the public information and participation concerns, an expansion of the information published about the proposed ELUR and public participation requirements for larger or more complicated sites, such as holding a public information session prior to finalizing the ELUR, is suggested. To address issues regarding the availability of information regarding an existing ELUR, it is recommended that a searchable database be available so that property managers and the public can see what restrictions are in place for a particular property.
- *Soil Reuse:* Additional guidance regarding requirements for approval and an application package would simplify DEEP review and reduce time needed for review.
- *Ecological Risk Assessments (ERAs):* Guidance is needed to help direct LEPs in how to identify the need for and properly perform such assessments. Additionally, better-defined requirements, standardized procedures, and self-implementing options will allow ERAs to be conducted iteratively in association with site characterization. DEEP is aware of this issue and is looking at options to streamline review and potentially provide sediment criteria.

3. **Difficulty Meeting GWPC and Groundwater Monitoring Timeframes -** Possible solutions include:

- Map and classify "non-productive" aquifers, i.e., aquifers that do not produce enough water for potable water production. This may mean adding another classification, other than the GA and GB classifications currently available. Michigan has a process by which the MIDNR can make a determination that a site lies in an unproductive aquifer where no public or private production wells are in use with a commensurate reduction in groundwater remedial standards reflective of a reduced risk scenario. Alternatively, potential use of aquifer reclassification based on urban density could reduce the number of sites required to meet drinking water standards where such use is highly unlikely.
- A streamlined process to address the residual risk for these sites, which is generally low, could facilitate the closure of many sites. An option may be amending §22a-133k-3 to include options for the derivation and use of risk-based groundwater criteria similar to the Method 3 process under the MCP and options for discontinuation of monitoring of demonstrated steady state plumes that meet these risk-based criteria.
- Provide guidance for or revise the RSRs to include options for assessing the stability of groundwater plumes (similar to NJ's Classification Exception Areas).
- LEAN analysis could reduce this review time for DEEP approval of discontinuation of monitoring requests, but an LEP-lead option could expedite less-complex sites.
- Provide guidance for requests for discontinuation of groundwater monitoring.

- Consider under what conditions groundwater criteria could be risk-based to speed closure. If the groundwater ingestion pathway is incomplete and it is rendered incomplete for future use, then the GWPC should not apply, regardless of groundwater classification.
- Revise groundwater monitoring requirements to include options for steady-state groundwater plumes, including a general permit for steady state and/or decreasing plume and guidance for obtaining TI waivers.

4. **New Releases / Contamination Resulting from On-going Operations** - Possible solutions include: Expand new/recent spill cleanup requirements such that RSR compliance or some other definitive endpoint is achieved, documented, and confirmed. It is suggested that the remedial work be limited to release areas and that there is close out of individual release areas.

5. **Expanding the Usability of ELURs and Alternate Mechanisms –** Possible solutions include:

- Evaluate potential use of a greater variety of institutional controls and adopt those that have been successfully used elsewhere, including Activity and Use Limitations (AULs, as implemented in Massachusetts), restrictions consistent with the Uniform Environmental Covenants Act (UECA, as implemented in Pennsylvania).
- Consider establishing an ELUR registry, where notices of ELURs in zoning, land use, and building permit records could be posted.
- Consider development of Special Zoning "Historical Development Design" Districts where pollution may be widespread and identify areas that may be subject to restriction. This may obviate the need for ELURs on a parcel by parcel basis. Districts would be developed based upon changes to zoning maps and zoning regulations in each Town. Similar to the model aquifer protection regulations, DEEP could develop model regulations as to the types of restrictions and what is required for a town to adopt.
- Creation of a website, with a readily accessible database that includes environmental information about a site, including the ELUR, prior reports, adjacent sites (similar to the California Geotracker). It is suggested that reports be required to be submitted in both hard copy and electronic format and certification made, at the time of filing the hard copy, that the report has been uploaded to the database system. Due to limited DEEP resources and the specialized type of database contemplated, consider granting procurement for a sub-contractor to outsource development of such a tool in an expedited timeframe. Once established, a nominal filing fee is suggested for each submission to defray the cost of development.

6. **Remedial Obligations for Historical Pesticide/Herbicide Impacts –** Possible solutions include:

- Under the Massachusetts MCP, releases (indicated by residues in the environment) resulting from the application of pesticides and herbicides consistent with their labeling are exempt from notification and therefore the MCP process. However, releases of

pesticides/herbicides that do not this meet this exemption are presumed to present a potential risk and therefore are subject to the requirements of the MCP.

- Provide options for statistical evaluation of contaminant concentrations in the environment to evaluate potential risk.

7. **Consideration of Differing Exit Pathways for Different State Cleanup Programs versus One Exit Pathway for a Variety of Cleanup Programs –** Possible solutions include:

- Create one, standard way out for all programs, including those that do not fall under the RSRs (e.g., spills, UST releases, solid waste). Allow for closure of a single release area so that certainty exists for a lender (or borrower or tenant) that no more work is needed in that one area.
- If the Transfer Act continues to exist, clarify that Certifying Parties / LEPs must verify the remediation of areas identified in the Phase II in accordance with Public Act 11-141.
- Consider accepting a Phase II on a release area basis and allow closure for those release areas, even if a Phase II for the entire site may not have been completed.
- If the Transfer Act continues to exist, REC investigations should not be revisited, recycled and redone in connection with changes in the underlying ownership if the actual owner of the property or establishment does not change.
- If the Transfer Act continues to exist, exempt certain transfers from filings under the Act based upon the historical classification (e.g., if Transfer Act forms were previously filed, the establishment is already undergoing investigation and remediation by a certifying party, and the new owner wouldn't otherwise be an establishment).

## *Recommendation for Area 5: Current State of Site Closure in CT versus Other States*

Information on types of finish lines that are successful in other states to achieve site closure is provided below. Conceptually, some of these may be able to be applied to CT's remediation programs, given the caveat that programs in each state might work because of the given laws in that particular state. With current CT state laws, piecemeal changes may not be appropriate. It is necessary to ensure that the statutes and regulations governing compliance end points work in concert with the laws that require sites to enter into a remedial program and the laws that allow that program to be carried out.

Based on the comparisons performed as described in the Areas of Evaluation Section above, the following areas are recommended for potential incorporation in Connecticut's remediation programs. For each category, some example state or federal programs that have addressed the topics are provided.

1. **Risk-Based Standards with More End-Use Options -** a wider range of receptor and or end-use based options would help move sites toward appropriate risk-based closure where it would have previously been unattainable. Examples from other states include:

→ **Massachusetts** - MCP Risk-based Criteria. This program offers the following tools and options:

- Wider variety of soil standards based on common exposure scenarios;
- Calculation of exposure point concentrations; and
- Site-specific risk characterization.

→ **New York - Subpart 375-6: Remedial Program Soil Cleanup Objectives** have look-up tables for:

- **"Unrestricted use"** is a use without imposed restrictions, such as environmental easements or other land use controls.
- **"Restricted use"** is a use with imposed restrictions, such as environmental easements, which, as part of the remedy selected for the site, require a site management plan that relies upon institutional controls or engineering controls to manage exposure to contamination remaining at a site. Restricted uses include:
  - (i) **"Residential use"** is the land use category which allows a site to be used for any use other than raising live stock or producing animal products for human consumption. Restrictions on the use of groundwater are allowed, but no other institutional or engineering controls are allowed relative to the residential use soil cleanup objectives. This is the land use category which will be considered for single family housing.
  - (ii) **"Restricted-residential use"** is the land use category which shall only be considered when there is common ownership or a single owner/managing entity of the site. Restricted-residential use (a) shall, at a minimum, include restrictions which prohibit any vegetable gardens on a site, although community vegetable gardens may be considered with Department approval, and single family housing; and (b) includes active recreational uses, which are public uses with a reasonable potential for soil contact.
  - (iii) **"Commercial use"** is the land use category which shall only be considered for the primary purpose of buying, selling or trading of merchandise or services. Commercial use includes passive recreational uses, which are public uses with limited potential for soil contact.
  - (iv) **"Industrial use"** is the land use category which shall only be considered for the primary purpose of manufacturing, production, fabrication or assembly processes and ancillary services. Industrial use does not include any recreational component.
- Soil standards for **Protection of Ecological Resources** and **Protection of Groundwater** have also been developed.

→ **Pennsylvania: PA Code (title 25) Uniform Cleanup Standards** function on three levels:

- Background - Mimics CERCLA (restore property to condition prior to contamination): Background concentrations are based on site characterization and must be approved by the PA DEP.

- Statewide Health - Mandated standards for residual contamination post remediation.
    - Groundwater: Used Aquifer and Non-Use Aquifer Criteria *(residential and non-residential standards)*
    - Soil: Residential *(0-15 feet)* and Non-Residential Standards (*surface soil 0-2 feet and Subsurface Soil 2-15 feet)* Soil to Groundwater standards are presented for SPLP comparison.
- Site Specific Health - Site is remediated to a specific standard based on the site's future use. A risk assessment and PA DEP approval are required.

2. **Wider Variety of Finish Lines for Different End-uses** – A site would have a better chance at closure using different pathways available. Sites could be prioritized, and closure could be expedited based on priority. Some examples from other states include:

→ **Massachusetts:** 9 categories can be used to demonstrate that closure has been achieved. Permanent solutions and Temporary solutions are available.

→ **New York:** The Brownfields Program has 4 different tracks for clean-up:
Track 1: Unrestricted use;
Track 2: Restricted use with generic soil cleanup objectives;
Track 3: Restricted use with modified soil cleanup objectives; and
Track 4: Restricted use with site-specific soil cleanup objectives.

→ **Pennsylvania:** There are 3 endpoints for clean up:
1) Unrestricted use (no deed restrictions, liability relieved);
2) Deed restriction only if remediated to non-residential standards (no industrial/ commercial use, release from liability); and
3) Deed restriction required (must be approved, release from liability).

3. **More autonomy for licensed professionals acting on behalf of the State (including appropriate guidance and audit provisions) –** More options, including those that are self-implementing (i.e., no DEEP approval required), would help move sites toward closure and decrease administrative delays. This would provide expediency and consistency when working to an endpoint. An example would be:

→ **Massachusetts:** The MCP is designed to be fully "self-implementing" and is supported by policy and guidance documents for all significant portions of the MCP. The LSPs are overseen by a robust audit program that allows the State to audit at any and all phases of a project.

→ New Jersey's program was not included as experiential evidence, given the young age of the program, was not available in any meaningful way.

4. **Formally Documenting Project Progress –** This process could help the process move more expeditiously with closure as the ultimate goal. Some examples from other states include:

→ **Massachusetts** - Address releases per the MCP process and adhere to the following milestones:

- Phase I Preliminary Site Investigation
- Phase II Comprehensive Site Assessment (source and extent) and Risk Assessment
- Phase III Identification and Selection of Remedial Action Alternative
- Phase IV Implementation of Remedial Action Alternative
- Phase V Operation and Maintenance (including Remedy Operation Status)

→ **New York** - Inactive Hazardous Waste Sites have different classifications based on site risk and stage of project. Five classifications for hazardous waste sites are specified in the Environmental Conservation Law:

- Class 1 Site: Causing, or presenting an imminent danger of causing, irreversible or irreparable damage to the public health or the environment - immediate action is required.
- Class 2 Site: Significant threat to the public health or environment - action required.
- Class 3 Site: Does not present a significant threat to the environment or public health - action may be deferred.
- Class 4 Site: Site properly closed - requires continued management.
- Class 5 Site: Site properly closed - does not require continued management

→ **RCRA Corrective Action** Environmental Indicators and Event Codes: Progress on Corrective Action sites is tracked on a national basis by EPA and authorized states. Important milestones include Groundwater and Human Health exposures under control, Remedy Selection, and Construction Complete, among others. Key phases of Corrective Action projects are documented by the Event Code in the EPA database (see Appendix C5, "Nationally Required Corrective Action Events");
http://www.epa.gov/reg3wcmd/pdf/rcrainfo_nationallyRequiredCorrectiveActionEvents.pdf)

# Discussion

Common themes began to emerge throughout the Workgroup's process of evaluating the current requirements for closure (finish lines) under the various Connecticut cleanup programs and making recommendations to improve the way Connecticut's cleanup programs work. These common themes included the need for more self-implementation by LEPs, the need for a more robust DEEP audit system and guidance, the need for a uniform approach for sites with legacy issues, the need for more levels of risk-based standards other than residential and commercial/industrial, and the need for more milestones and established timeframes.

The Licensed Environmental Professional (LEP) program was created to allow oversight of investigation and remediation activities in lieu of DEEP. Experience has shown, however, that the LEP program does not effectively operate independently due to the practice of and sometimes regulatory requirement to seek DEEP review and approval of LEP decisions which allow for site closure to be accomplished in a protective but feasible and cost-effective manner.

Obtaining DEEP approval for variances from the RSRs, such as for technical impracticability variances, engineered and institutional controls, alternative risk-based standards and/or environmental land use restrictions, can increase the time it takes to achieve site closure. Less dependence on DEEP for approvals and increased numbers of DEEP remediation staff along with more autonomy for LEPs, with increased protocols, guidance documents, and audit provisions would help move sites toward closure sooner.

In addition, a uniform approach to certain categories of sites would likely serve to decrease administrative delays and provide expediency and consistency when working to a remediation endpoint, while maintaining public trust in the process. A few legacy issues were identified that often cause delays in attaining site closure, including sites involving historic urban fill, residual agricultural impacts associated with pesticide applications, and/or impacted sediments. The workgroup agreed that a framework should be established to improve how these conditions are addressed, with the goals of such framework being sufficient protection of human health and the environment, flexibility, clarity, consistency and increased self-implementation by LEPs. These legacy issues often involve the need for approval of engineered and/or institutional controls and environmental land use restrictions to allow for affordable yet protective remediation. The development of a more uniform approach, aligned with the risk presented that also takes into account the cost of the solution and the relative benefits achieved, may move these properties more quickly toward a beneficial reuse.

Under the RSRs, different standards/remediation criteria are applied depending on site use. Currently, there are two sets of remediation criteria: residential and commercial/industrial (essentially whatever is considered not to be a residential use). However, certain types of properties currently defined as “residential” may involve much less frequent and intensive exposure than is associated with a true residential property. Therefore, the group generally agreed that there should be appropriate default risk-based standards established for that class of sites (and perhaps other types of land uses) that can be used in a self-implementing fashion. Other states have developed programs that offer a wider variety of closure endpoint standards based on expected end uses of the property. Alternative pathways with different finish lines can provide increased flexibility for achieving site closure and allow for a better chance of attaining risk-based site closure in light of existing economic and limited DEEP resources.

While other states have set milestones and time frames, the Connecticut programs largely have not. Milestones and timeframes will enable DEEP to improve tracking of site progress, provide this information to the public, and set deadlines for site closure. Coupled with incentives and disincentives for reaching site closure, established milestones and timeframes could help move sites toward closure faster. Additionally, establishment of more milestones may provide an increased opportunity for public involvement during the course of site investigation and remediation, especially for those high visibility sites or sites of significant public interest.

While the group consisted of various interested parties, the themes above were acknowledged albeit in varying ways by all the subgroups. The following is a summary of common recommendations based upon these themes:

- Endpoints should:
    - Be better aligned with the current and future risk presented;
    - Address other categories of end-use beyond residential and commercial/industrial;
    - Exist at various stages of remediation (e.g., by release area);
    - Be flexible to permit closure of areas when a new release occurs;
    - Address incidental releases in a more uniform manner (e.g., impacts from petroleum hydrocarbons or polynuclear aromatic hydrocarbons [PAHs] from roads/parking lots);
    - Realistically account for aquifer viability and legacy properties (those affected by urban fill, pesticide contamination and contaminated sediments based upon watershed);
    - Allow an alternate path for existing and active properties when significant exposure pathways have been addressed until a change in use or change in ownership occurs; and
    - Permit closure for sites with stable groundwater plumes.
- General Permits should be developed to standardize the approval process for commonly used types of engineered controls.
- Guidance documents should be developed that describe option that are acceptable to DEEP as to how an issue may be addressed (but it must be made clear that it is guidance only and other methods may be appropriate). Where available, DEEP should utilize and take advantage of EPA research and source documents (i.e., the EPA risk assessment guidance) to aid in risk-based decision-making and enhanced self-implementation of site cleanup by LEPs.
- Business and financial considerations must be a factor in the remediation, schedule and timeliness of approvals.
- Public monies should be made more readily available to areas where contamination may be widespread and where jobs may be created and/or retained.

- Options for institutional controls, land use restrictions and activity and use limitations beyond the existing Environmental Land Use Restriction (ELUR) scheme should be explored – particularly in areas of historic impacts. The ELUR process itself should be simplified to overcome processing delays and issues presented by inability to obtain subordination agreements.

- Balance technical achievability and cost with human health/environmental benefits.

- Modify the relevant statute relating to the LEP verification to align the scope of the LEP verification to a certifying party's remedial responsibilities.

- Develop meaningful timeframes and provide for a transparent process and public involvement, potentially with public information sessions at various remedial milestones.

- Develop a searchable, public website database that provides information including all environmental reports and DEEP approvals/notices so that a database of information is developed that can inform the regulated community. Provide DEEP with the authority to procure the development of the website.

Upon providing a better road map, with more certainty to the regulated community and allowing for flexibility as to the scope of cleanup under various scenarios and the utilization of risk-based assessments, the regulated community may be able to achieve site closures in a manner that is cost-effective, timely, and protects of human health and the environment, while maintaining public trust in the process.

Whereas the subgroups and the workgroup at large reached consensus on the topics discussed above and most recommendations provided, consensus was not always reached for some of the assumptions or particular recommendations within a given topic. The following provides a discussion of these areas and what the minority view concerns were:

- Many recommendations called for increased autonomy for the LEPs to use their professional judgment and have additional self-implementing alternatives at their disposal without requiring DEEP to review and approve them. Some members stressed that DEEP should proceed with caution to ensure that such additional delegation only be granted in areas where an appropriate level of confidence and public trust in the process can be maintained via appropriate guidance, public participation, and robust DEEP auditing, similar to that in other states (MA).

- A number of recommendations were made based on the collective experience of some workgroup members that a majority of sites get delayed at the point in a remediation project when DEEP approvals on variances and other alternative approaches are needed. However, not everyone agreed that a majority of sites get delayed for this reason.

Specifically for ELURs, although there was agreement on the need to address issues related to developing alternatives to subordination agreements, there was disagreement on whether the timeframe has been reduced for reviewing ELURs, as the improvements to the process through DEEP's recent LEAN effort may not yet be realized.

- Although the group as a whole recognized the need for clear and scientifically defensible methods and guidance to develop Alternative Criteria and criteria for Additional Polluting Substances, there were differing opinions as to how to go about this. The current approval process can be lengthy and highly uncertain. An example cited during the discussion recalled the significant controversy that arose during attempted modification of the remediation standards in 2008, during which concerns were raised by several groups of stakeholders, including whether the proposed risk-based standards were feasible and achievable; whether such proposed limits were economically or technically achievable; whether such proposed standards were based upon the best available scientific information; and why such proposed standards were not consistent with federal standards. There are differing perceptions within the workgroup about how the state process and methodology for developing such standards works. Not all group members agreed with the concerns in the above example, particularly the recommendation that DEEP adopt specific federal risk assessment guidance as the sole methodology for development of risk-based remediation standards.

- There were differing perceptions about DEEP staffing demands versus oversight needs. Although most believed that DEEP is currently severely understaffed, others questioned whether staffing resources are being directed appropriately and how that will change if the remediation programs and associated DEEP review and approval processes are revamped. The consensus view appeared to be that it will have to evolve over time as changes are instituted. The challenge will be to fund the DEEP with appropriate resources to match the demand of the transformed remedial programs and the regulated community. A proposed recommendation to offer expedited DEEP review for an additional fee was viewed as being potentially unfair to certain regulated parties by some group members.

- The group reached consensus that more public participation is useful, but disagreed as to the timing and availability of information provided to the public and local government. Some asserted that more frequent public involvement increases certainty and reduces the overall time to closure, while others opined that it can increase the timeframe.

# Appendices

# *Appendix A – Meeting Minutes*

Comprehensive Cleanup Workgroup 2
**Evaluation Finish Lines &**
**How Risk and Other Factors Influence Closure**
August 31, 2011 Minutes

**Scope:** Evaluate the current requirements for closure (where is the finish line) under the Connecticut cleanup programs. Document and evaluate the factors that influence the time needed to reach investigation and remediation closure, evaluate how risk and other factors influence when closure is achieved, and evaluate how interested parties rely on closure and whether current finish lines meet their needs or expectations.

**Deliverable:** Present information from this evaluation and discuss ways that closure could be obtained more quickly while meeting the needs and expectations of interested parties.

**Participants:** Camille Fontanella (co-lead); Matthew Coldwell; Gary Cluen; Maurice Hamel; Margaret Harvey; Nicholas Hasting; Kelly Meloy; Kevin King; Lauren Levine; Martin Mador; Mark Mitchell; David Sherman; (By phone: Eric Henry; Jessie McCusker) (Absent: Ann Catino; John Wertam) (Also present: Graham Stevens; Kevin Neary, Edith Pestana)

The Work Group Evaluation Guidance fact sheet was distributed.
Graham Stevens gave overview and history and timeline for the comprehensive evaluation and transformation of Connecticut cleanup laws.
Participants introduced themselves.
Maurice Hamel was appointed note taker.
Started with "Legal Requirements" table from January 2011 white paper "Comprehensive Evaluation of Connecticut's site Cleanup Programs".
Read list of current statutes from page 2 of white paper.

Discussion Highlights

- What does the legislature expect?
- We are not looking to do more incremental changes as we have over the past 25 years. We are looking at revising our approach to deal with risk more effectively. Need to get more sites into the system, but also provide a way to get them out of the system.
- Are we trying to produce one consistent exit or multiple?
- We can recommend making exit points more clear.
- We can recommend a better way to deal with a finish line. Short-term risk. Broader concepts.
- Is a single finish line reasonable?
- Don't want to inhibit people from entering a clean-up program out of fear of a lengthy exit process.
- Short-term and long-term clean-ups, factors and timing issues.
- Specific release or entire site being addressed, with or without controls
- Which is where risk comes in
- We encourage the Significant Hazard sites to use the Voluntary Programs to get an endpoint sign-off by DEP or LEP.
- Factors influencing timing for closure:

1. Motivations to finish based on such items as business drivers (e.g., private party transactions), cost, statutory deadlines, etc.
2. Need for approvals, such as variance under the RSRs, risk assessments and alternative polluting substances, as well as sign-offs for DEEP lead sites.
3. Groundwater Monitoring time frames for closure (Stringent groundwater remediation standards prevent some low risk sites from getting sign-offs.)
4. Site complexity
5. Lack of certainty on: Numerical cleanup criteria; Engineered Controls; Technical Impracticability; and NAPL. Need for cleanup standards for recreational use, and other self-implementing risk assessment options.

- Do you think these factors apply broadly to all sites and programs?
- Two separate types of finish lines:
- Mitigating acute risks through programs such as Significant Environmental Hazards and Spills
- Addressing the chronic risks through RSR compliance for other programs (e.g., Transfer Act, Voluntary Remediation Programs)
- Not all programs have an RSR endpoint.
- RSRs are not just numbers. They also include risk assessment options.
- The additional tasks that follow the remedial phase, are simply documenting that risk has been abated.
    - DONE = Clean-up
    - DONE – DONE = Completion of monitoring
    - DONE –DONE –DONE = Sign-off or no audit letter
- Responsible parties are looking for certainty in planning for future costs. This may be sufficiently achieved for some responsible parties by the completion of the active remediation phase (“DONE”). It could include an interim / portion of parcel verification, approvals appropriate to support a Form 4.
- Metrics don’t show progress of clean-ups achieved in risk reduction; only show “DONE-DONE”.
- The public needs to know the different levels of clean-up.

  Control
  Clean-up
  Monitoring
  Final Approval
- Those types of things are used for Corrective Action milestones for large complicated sites.
- How to push toward finish line? How to make listings of milestones achieved publically available?
- It may be valuable to document the number of acres that are ready for reuse for large sites as is under consideration by EPA for RCRA Corrective Action sites. Another item under consideration by EPA is the recognition that flexible timelines and approaches are necessary when addressing site-wide investigation and remediation at operating facilities. Many facilities have operational, safety, governmental, or other factors that make investigation and/or remediation very difficult, if not impossible. Approaches that limit risk and receptor exposure could be utilized until a time when investigation/remediation is possible.
- A good milestone to share with the public is that active remediation has been completed.
- There needs to be transparency, such as tracking progress of sites on the web. Milestones such as remedy selection and construction complete could be used. A few suggested milestones are listed below:
    1. Completion of Investigation;
    2. Completion of Remedial Action Plan and Remedial Public Notices;
    3. Completion of protection of receptors;

4. Completion of active remediation;
5. Completion of post-remedial monitoring;
6. Completion of Audit process.

- With the advent of legislative changes in 2007/2009, the Department is keeping track of Completion of Investigation and Remedial Action Plan milestones. Additionally, the Roundtable List of Contaminated Sites Workgroup is making recommendations to add more milestone events and details to the List on the website.
- We need to make sure that milestones and administrative endpoints do not become a financial burden distracting resources from risk reduction. We need to see what has worked and what has not worked in EPA's approach.
- Part of this group's task should be delineating key milestones, not just endpoints.
- How to give people credit for work completed to meet their internal needs and expectations?
- We need to make milestones match current deliverables.
- Milestones currently being achieved include:
    - Phase II and III (COI)
    - Public Notice and Completion of RAP
    - Partial Verifications
- These are being submitted by LEPs for new transfer sites.
- Sites could be categorized by risk, with some being done when they reach the first milestone. Soil remediation provides an endpoint that is reasonable and achievable. Groundwater standards and monitoring requirements are a "long tail" extending beyond the completion of remedial actions that eliminate the risk. Unworkable groundwater monitoring goals is the biggest factor behind clients stopping projects prior to trying to achieve a full sign-off.
- In Mass. a Tier I has addressed short-term issues. Tier II is risk has been mitigated. Tier III closure is groundwater monitoring being done.
- We should get credit for having achieved the milestone of a stable or decreasing groundwater plume.
- For GWPC, we don't have any existing self-implementing Tier II options. We should be able to more accurately/reasonably consider potential risks (e.g., based on distance to receptors, realistic assessments of future use of groundwater for drinking water supply).
- That could effectively be a TI General Permit showing that there had been a sufficient mitigation of risks, but that might not be the same as calling a site "clean" as fully meeting the RSRs.
- It would need to be done in a way that would not over-burden DEEP staff with individual determinations.
- Does data exist for what milestones have been achieved for a project?
- What milestones are the interested parties, such as a bank, interested in seeing?
- Clients want final closure of their obligations, not just to achieve milestones.
- Duration of monitoring and elimination of Post-Remedial Monitoring is not enough.
- We need to be able to get a variance from GWPC in GA areas where it is not a useful aquifer and plume meets criteria at the property line or some other point on the site.
- How to mitigate non-compliance with GWPC on someone else's property (e.g., using such mechanisms as TI variance with institutional control such as ELUR to prevent installation of water supply wells within non-compliance area)?
- The compliance point for groundwater is key. RCRA uses this approach.
- GA areas are extensive in the state. But in some areas, no one may be currently using the groundwater for drinking water supply. We should be able to consider such factors as where water is currently being used, where public water supply is available, where aquifer is sufficiently productive, to re-evaluate appropriate groundwater remediation standards.
- ELUR prohibiting wells on downgradient properties. (This is what is used for a TI.)

- Is public water supply available?
- Need a means to address long-term low level groundwater contamination that remains following completion of active remediation. This could be accomplished using different compliance methods, different compliance points, different remedial criteria, and/or the use of institutional controls.
- Good ideas and issues to be addressed by group also need to focus on goals that would be achievable for December 15th.

Proposed data gathering to be completed by Sept. 16th to finish presentation and report writing by Sept. 28th
Suggestion to use flip charts for our next meeting.
Five smaller groups were formed which will interact by e-mail prior to the next meeting to address tasks presented in the scope for the Workgroup:

**Group 1**
**Task:** Outline factors that influence the time taken or needed to reach site closure under state remedial programs.
**Participants:** Kelly, Lauren, Meg, Matthew (Camille, Maurice)
**Group 2**
**Task:** Evaluate how risk and other factors (see Group 1) influence achievement of site closure. Expand on why or how these factors affect site closure, if appropriate.
**Participants:** Kelly, Lauren, Meg, Matthew (Camille, Maurice)
**Group 3**
**Task:** Evaluate how interested parties rely on site closure. Gather information on which milestones fulfill their needs/expectations, including achieving the ultimate site closure finish line.
**Participants:** Marty, Mark, Gary, John (Camille, Maurice)
**Group 4**
**Task:** Identify and describe ways in which site closure could be achieved more expediently. Consider differing exit pathways for different state cleanup programs, or one exit/pathway for variety of cleanup programs.
**Participants:** Eric, Kevin, Ann (Camille, Maurice)
**Group 5**
**Task:** Summarize the current state of achieving site closure under state remedial programs. Outline and contrast with how site closure is achieved in remedial programs in other states.
**Participants:** Nick, David, Jess (Camille, Maurice)

Kelly Meloy was selected as Co-Leader for the Workgroup.
The next meeting is Tuesday Sept 6th from 1:00 to 3:00.

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Comprehensive Cleanup Workgroup 2
**Evaluation Finish Lines &**
**How Risk and Other Factors Influence Closure**
September 6, 2011 Minutes

**Scope:** Evaluate the current requirements for closure (where is the finish line) under the Connecticut cleanup programs. Document and evaluate the factors that influence the time needed to reach investigation and remediation closure, evaluate how risk and other factors influence when closure is achieved, and evaluate how interested parties rely on closure and whether current finish lines meet their needs or expectations.

**Deliverable:** Present information from this evaluation and discuss ways that closure could be obtained more quickly while meeting the needs and expectations of interested parties.

**Participants:** Camille Fontanella (co-lead); Gary Cluen; Maurice Hamel; Margaret Harvey; Nicholas Hastings; Kelly Meloy (co-lead); Kevin King; Lauren Levine; Martin Mador; Mark Mitchell; David Sherman; Jessie McCusker; Eric Henry (Absent: Ann Catino; John Wertam; Matthew Coldwell)

**I. Scribe for the day =** Nick Hastings

**II. The five smaller groups reported out:**

**<u>Groups 1 & 2 (combined group report)</u>**
**Group 1 Task:** Outline factors that influence the time taken or needed to reach site closure under state remedial programs.
**Group 2 Task:** Evaluate how risk and other factors (see Group 1) influence achievement of site closure. Expand on why or how these factors affect site closure, if appropriate.
**Participants:** Kelly, Lauren, Meg, Matthew (Camille, Maurice)

→ Factors in the group's draft included (in no particular order):

1. Site's Scientific Complexity and Magnitude of Impacts Warranting Remediation
2. Need for Regulatory Agency Approvals or Permits
3. Technological and/or Physical Limitations
4. Clarity and/or Certainty with respect to Remedial Standards
5. Unreasonable Remedial Standards or Requirements
6. Financial Considerations
7. Business Drivers
8. Site Use and Reuse Considerations
9. Statutory or Regulatory Deadlines
10. Legal Issues
11. Political Drivers, including Community/Public Interest

→ The group will work on consolidating factors into fewer/broader categories (esp. finding appropriate categories for items currently under "5. Unreasonable Remedial Standards or Requirements")

→ The group will also add evaluation of the factors into the draft document.

**<u>Group 3</u>**
**Task:** Evaluate how interested parties rely on site closure. Gather information on which milestones fulfill their needs/expectations, including achieving the ultimate site closure finish line.
**Participants:** Marty, Mark, Gary, John (Camille, Maurice)

→ No report out yet [stayed after meeting with other volunteers to brainstorm]

**<u>Group 4</u>**
**Task:** Identify and describe ways in which site closure could be achieved more expediently. Consider differing exit pathways for different state cleanup programs, or one exit/pathway for variety of cleanup programs.
**Participants:** Eric, Kevin, Ann (Camille, Maurice)

→ Eric & Kevin gave partial report – Ann's input forthcoming. The following topics were presented and some potential solutions were discussed (see draft Task 4 document):

- Investigation doesn't seem to be an issue, although different methods and goals are utilized for operating vs. closed sites – makes for different ways of achieving site closure.

- Minimize the need for DEEP approvals for LEP-lead sites: Some stakeholders may have reservations regarding less oversight of LEPs for some areas of the regulations.
    - Extended compliance monitoring time-frames
    - New Issues Created by On-going Operations
    - A General Permit for TI Waiver in GA Groundwater Areas
    - Use of ELURs at sites not otherwise in program to which the RSRs apply
- The need of an Ecological Risk Assessment is a significant bottleneck
    - Remedial obligation for historical pesticide/herbicide impacts

→ Differing Exit Pathways vs. One Exit Pathway: some initial discussion, but more forthcoming from this group.

**Group 5**

**Task:** Summarize the current state of achieving site closure under state remedial programs. Outline and contrast with how site closure is achieved in remedial programs in other states.

**Participants:** Nick, David, Jess (Camille, Maurice)

→ Reviewed state & EPA comparison research compiled thus far: Suggestion made to supplement comparison table with some narrative for each state (similar to what is there for MA already)

→ Also presented draft milestone comparison chart.

→ Group will finish compilation and generate a comparison and suggestion memo for next meeting.

**III. Schedule Going Forward:**

→ Data gathering/group reports to be completed by Sept. 16th (draft by meeting on the 15th)

→ Presentation and report writing by Sept. 28th

**IV. The next meeting will be:** Thursday Sept 15th from 2:00 to 4:00pm – Room 6C.

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Comprehensive Cleanup Workgroup 2

**Evaluation Finish Lines &**

**How Risk and Other Factors Influence Closure**

September 15, 2011 Minutes

Attendees: Ann Catino, Camille Fontanella, David Sherman, Eric Henry, Gary Cluen, Jesse McCusker, John Wertam, Kelly Meloy, Kevin King, Lauren Levine, Mark Mitchell, Martin Mador, Matthew Coldwell, Maurice Hamel, Meg Harvey, Nick Hastings

- Draft report due 9/23/11
- Coordinated schedules on two future meetings
    - Next meeting to be held on Wednesday September 21, 2011 from 1:30 to 3:30 pm
    - Final meeting to be held on Monday, September 26, 2011 from 11:00 am to 1:00 pm
- Reviewed Tasks 1 & 2: Factors that influence time taken/needed to reach site closure under state remedial programs and how factors influence time to closure
    - Deliverable was reorganized and reformatted to focus on evaluations and solutions
    - Site's Technical Complexity and Magnitude of Impacts Warranting Remediation
        - Evaluates ERA and DNAPL
        - Clarification of DNAPL language
    - Risk Endpoint
        - Pulled items from other categories and recombined them under this new category

        - Evaluates TPH/ETPH
        - Potential addition of recreational criteria
            - Add open space and parks to memo
        - Increase site-specific options and flexibility
        - Evaluate utility of different risk end points for sites in different programs
        - Risk levels could be based on both current and future land uses
    - Need for Regulatory Agency Approvals or Permits
        - Significant overlap with Task 4
        - MCP viewed as having some potential solutions, i.e., self-implementing program with rigorous audit systems
        - Potential use of
            - General Permit for engineered controls
            - Urban fill exemption similar to MCP
        - Much discussion among group about transparency of ELURs
            - Improve the public notice/participation process
            - Make the ELUR more understandable to the layman; public doesn't understand what ELURs are used for
            - Make ELUR information more readily available to the public
            - Better dissemination of information
    - Technological, Chemical and/or Physical Limitations,
        - No substantive changes since last iteration
    - Public Policy Considerations
        - Retitled this category
        - Evaluates urban fill and pesticide/herbicide. Note that there is some overlap on these issues with Task 4.
    - Financial Considerations, Business Considerations, Site Use and Reuse Considerations, Statutory or Regulatory Deadlines
        - Categories weren't discussed due to time constraints
    - Legal Issues
        - Discussion of institutional controls used by other states, e.g., PA UECA, MA AUL, environmental covenants, etc., and their potentially applicability to CT
        - An IC similar to the MA AUL was stalled due to issue of "real property"
        - Brownfields workgroup may have some good findings, solution regarding ICs
        - Need to tighten language with respect to certifying parties
- Reviewed Task 3: Evaluate How Interested Parties Rely On Site Closure. Gather Information On Which Milestones Fulfill Their Needs/Expectations, Including Achieving The Ultimate Site Closure Finish Line
    - Defined three classes of interested parties
        - Public
        - Private
        - Institutional/regulatory
    - Reframed the task to better focus on evaluation and solutions
    - Used many generally recognized milestones
    - Accessibility of milestone information viewed as important
        - Online tools, database
        - Email notification
    - The relative importance of a milestone is based on the perspective of the interested party
    - Workgroup suggests different end point ("exit ramps") for different interested parties; may not need to progress a property to "full closure"

- What do interested parties want to see once a milestone has been achieved? DEP approval? LEP verification?
- Need to come to a consensus on which milestones are important

❖ Reviewed Task 5: Summarize the current state of achieving site closure under state remedial programs. Outline and contrast with how site closure is achieved in remedial programs in other states.

- Four categories of options
- Risk-based Standards with More End-use Options
  - MCP EPCs for soil and groundwater and/or Method 3 risk assessment. Evaluate risk for current and foreseeable future.
  - NY Brownfields program uses SCOs and consider risk in the context of current use and future reuse
  - PA uses three levels of standards: background, state-wide criteria with published tables, and site-specific criteria
- Wider Variety of Finish Lines (Different Clean-up Tracks/Categories) for Different End-uses
  - NY Brownfields program has four tracks for clean-up; some are quicker/easier to achieve than others
  - MA has three classes of closure (RAOs) which can be implemented depending on various factors, i.e., permanent or temporary solutions, restricted or restricted use, achievement of background, etc.
  - PA has paths for restricted and unrestricted uses
- More Autonomy for Licensed Professionals Acting on Behalf of the State
  - MA is largely self-implementing but audits are conducted "in-process" and much more frequently than in CT
  - NJ LSRP
- Formally Documenting Project Progress
  - MA MCP Phases I though V/ROS
  - NY Inactive Hazardous Waste Sites program uses five classes based on risk level
  - RCRA has numerous "codes" delineating assessment and remediation process

❖ Reviewed Task 4: Identify and describe ways in which site closure could be achieved more expediently. Consider differing exit pathways for different state cleanup programs, or one exit/pathway for variety of cleanup programs.

- Discussion of increased flexibility for REC by REC closure as endpoints are achieved at larger sites with distinct release areas
  - Need to consider site-wide issues and how these issues may be addressed in the audit process
  - LEPs can currently verify certain areas but primarily along legal boundaries, i.e., parcels/portions of properties
- Potential creation of special zones for areas with ELURs
- Consider potential use of alternate mechanisms, e.g., deep restrictions, environmental covenants, etc.
- Eliminate "ELURs for sites not in programs" from report as this is not possible
- Solid waste disruption rules are complicated because of the need to comply with both SW regulations and RSRs. Potential solution may be to funnel the SW disruption and closure requirements through RSR program

❖ Presentation. Camille and Kelly will find out tomorrow at workgroups meeting (9/16/11) if there will be a presentation and, if so, what the format will be

❖ Camille and Kelly to start pulling together report

## *Appendix B – List of References*

**Areas 1 and 2 References**

Privatized LEP Program References:


1. Licensed Environmental Professional Program fact sheet prepared by Connecticut Department of Energy & Environmental Protection, last updated February 2010, http://www.ct.gov/dep/cwp/view.asp?a=2715&q=324978&depNav_GID=1626.
2. OLR Bill Analysis, SB 1189, An Act Concerning Revisions to the Hazardous Waste Establishment Transfer Act and Hazardous Waste Site Remediation, http://www.cga.ct.gov/ps95/ba/1995SB-01189-R00-BA.htm.


Historic Fill Reference:


3. Historic Fill Workgroup Summary Handouts, Massachusetts Department of Environmental Protection, http://www.mass.gov/dep/cleanup/hisfil.pdf.


Groundwater Protection References:


4. Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action, U.S. Environmental Protection Agency, EPA530-R-04-030, April 2004, http://www.epa.gov/epawaste/hazard/correctiveaction/resources/guidance/gw/gwhandbk/gwhb041404.pdf.
5. Potentially Productive Aquifer Fact Sheet, http://www.mass.gov/dep/cleanup/laws/ppafact.htm.
6. Determining Non-Potential Drinking Water Source Areas, Policy WSC-97-701, April 30, 1997, http://www.mass.gov/dep/cleanup/laws/gispol.pdf.
7. Petitioning for a Case-Specific Designation of a Non-Potential Drinking Water Source Area, draft document, http://www.mass.gov/dep/cleanup/laws/petpol.pdf.


Activity and Use Limitations (AULs) and Uniform Environmental Covenants Act (UECA) References:


8. Guidance on Implementing Activity and Use Limitations, Massachusetts Department of Environmental Protection, Interim Final Policy WSC-99-300, May 1999, http://www.mass.gov/dep/cleanup/laws/99-300.pdf.
9. Guidance on Implementing Activity and Use Limitations, Massachusetts Department of Environmental Protection, Interim Final Policy WSC-11-300, Public Review Draft, December 2010, http://www.mass.gov/dep/cleanup/laws/auldr.pdf.
10. Uniform Law Commission, The National Conference of Commissioners on Uniform State Laws, http://uniformlaws.org/Act.aspx?title=Environmental%20Covenants%20Act.
11. Uniform Environmental Covenants Act Fact Sheet, EPA, http://www.epa.gov/superfund/policy/ic/pdfs/kerr_ueca.pdf.

12. Pennsylvania Uniform Environmental Covenants Act, December 2007, http://pa.gov/portal/server.pt/community/land_recycling_program/10307/uniform_environmental_covenants_act/552045.

Risk Assessment References:

13. "Superfund Risk Assessment" Home Page, http://www.epa.gov/oswer/riskassessment/risk_superfund.htm.
14. "Superfund Risk Assessment" Key Policy Guidance Documents, http://www.epa.gov/oswer/riskassessment/policy.htm.
15. "RAIS: The Risk Assessment Information System." (Oak Ridge National Laboratory) Several guidance documents can be found on this site describing the use of ecotoxicological benchmarks, http://rais.ornl.gov/
16. Use of Risk Assessment in Management of Contaminated Sites, The Interstate Technology & Regulatory Council, August 2008, http://www.itrcweb.org/Documents/Risk_Docs/RISK2.pdf.
17. Risk Characterization and Evaluation Fact Sheet, How Clean is Clean Enough, http://www.mass.gov/dep/cleanup/laws/risk_pmp.pdf.
18. First Report of the State of Connecticut Brownfield Working Group established pursuant to Public Act No. 10-135, submitted to the Commerce Committee of the Connecticut General Assembly, March 8, 2011, Page 13.

Ecological Risk Assessment References:

19. *EPA's Contaminated Sediment Management Strategy* (USEPA 1998a), http://water.epa.gov/scitech/swguidance/waterquality/cs/upload/1998_05_15_cs_strategy.pdf
20. "Contaminated Sediments In Superfund"/ "Guidance Documents, Fact Sheets and Policies" http://www.epa.gov/superfund/health/conmedia/sediment/documents.htm
21. *Guidelines for Ecological Risk Assessment* (USEPA 1998c), http://oaspub.epa.gov/eims/eimscomm.getfile?p_download_id=36512.
22. *Critical Issues for Contaminated Sediment Management* (Apitz et al. 2002), http://www.clu-in.org/download/contaminantfocus/sediments/critical-sediment-mgt-sedmgt.pdf.
23. *A Guidance Manual to Support the Assessment of Contaminated Sediments in Freshwater Ecosystems*, 3 vols. (MacDonald and Ingersoll 2002), http://www.clu-in.org/download/contaminantfocus/sediments/guidance-assessment-freshwater-epaVolumeI.pdf.

**Area 3 References**

None.

**Area 4 References**

EPA's Triad Approach, http://www.triadcentral.org/over/index.cfm

Remediation Standard Regulations, RCSA §22a-133k-1 through -3 inclusive, http://ct.gov/dep/lib/dep/regulations/22a/22a-133k-1through3.pdf

CT Transfer Act, CGS 22a-134 through 22a-134e, http://www.cga.ct.gov/2011/pub/Chap445.htm#Sec22a-134.htm

Environmental Land Use Restrictions, CGS Sections 22a-133n through 22a-133s http://www.cga.ct.gov/2009/pub/Chap445.htm#Sec22a-133n.htm and RCSA Section 22a-133q-1 http://www.ct.gov/dep/lib/dep/regulations/22a/22a-133q-1.pdf

NJ Classification Exception Areas (CEAs), Final Guidance on Designation of Classification Exception Areas, http://www.nj.gov/dep/srp/guidance/cea/ceaguid2.pdf

Massachusetts Contingency Plan, 310 CMR 40.0000, http://www.mass.gov/dep/cleanup/laws/mcptoc.htm

California State Water Resources Control Board, Geotracker, http://geotracker.swrcb.ca.gov

United States Environmental Protection Agency, RCRA Corrective Action Program, Environmental Indicators, http://www.epa.gov/epawaste/hazard/correctiveaction/eis/index.htm

**Area 5 References**

Pennsylvania Code (Title 25)
http://www.portal.state.pa.us/portal/server.pt/community/land_recycling_
program/10307/_statutes___regulations/552036
http://www.pacode.com/secure/data/025/chapter250/chap250toc.html

New Jersey Industrial Site Recovery Act, Environmental Cleanup Responsibility Act
http://www.state.nj.us/dep/srp/

Massachusetts Contingency Plan (310 CMR 40.0000)
http://www.mass.gov/dep/cleanup/laws/mcptoc.htm

6 NYCRR PART 375 Environmental Remediation Programs
http://www.dec.ny.gov/about/627.html
http://www.dec.ny.gov/docs/remediation_hudson_pdf/part375.pdf

RCRA Corrective Action
http://www.epa.gov/osw/hazard/correctiveaction/
http://www.epa.gov/reg3wcmd/pdf/rcrainfo_nationallyRequiredCorrectiveAct
ionEvents.pdf

## *Appendix C – Additional Information*

**Summary List of Regulatory Options Mentioned in this Report Currently Requiring DEEP Approval**

| Regulatory Option | Statutory/Regulatory Citation(s) |
|---|---|
| Additional polluting substances | RCSA 22a-133k-2(b)(4), RCSA 22a-133k-2(c)(5), RCSA 22a-133k-3(h) |
| Alternative soil criteria* | RCSA 22a-133k-2(d) |
| Alternative surface water protection criteria | RCSA 22a-133k-3(b)(3)(B) |
| Alternative volatilization criteria | RCSA 22a-133k-3(c)(4)(B) |
| Ecological risk assessment | RCSA 22a-133k-2(i) |
| Engineered controls | RCSA 22a-133k-2(f)(2)(B) |
| Environmental land use restrictions | RCSA 22a-133-q-1 |
| Exemption from volatilization criteria | RCSA 22a-133k-3(c)(5)(A) |
| Reuse of polluted soil | RCSA 22a-133k-2(h)(3) |
| Widespread polluted fill | RCSA 22a-133k-2(f)(1) |
| Variance due to technical impracticability of groundwater remediation | RCSA 22a-133k-3(e)(2) |
| Discontinuation of groundwater monitoring | RCSA 22a-133k-3(g)(3) |

* Inclusive of alternative criteria, alternative dilution, or dilution attenuation factor