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GREENER CLEANUPS GUIDANCE WSC #14 – 150

This document provides guidance in support of 310 CMR 40.0191 and 310 CMR 40.0858 on recommended approaches that maximize the net environmental benefit when conducting response actions at disposal sites regulated under the Massachusetts Contingency Plan (MCP), 310 CMR 40.0000. Recommended approaches include adherence to available industry standards and guidance as described further in this document.

This document is intended solely as guidance. It is not a regulation, rule or requirement, and should not be construed as mandatory. It does not create any substantive or procedural rights, and is not enforceable by any party in any administrative proceeding with the Commonwealth. This document provides guidance on approaches MassDEP considers acceptable for meeting the general requirements set forth in the MCP. Parties using this guidance should be aware that other acceptable alternatives may be available for achieving and documenting compliance with the applicable regulatory requirements and performance standards of the MCP.



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BACKGROUND

Traditionally, the approaches and technologies used for the assessment and remediation of oil and hazardous material disposal sites have been based primarily on the protection of human health and the environment, with an emphasis on technical practicability, timeliness and cost. While these approaches focus on remediating a site, they may further impact the environment through increased energy use and associated detrimental air emissions, adverse effects on natural resources and the generation of wastes. Over the past few years, the Massachusetts Department of Environmental Protection (MassDEP), the United States Environmental Protection Agency (USEPA), and numerous other agencies, institutions and organizations have been evaluating the use of “greener cleanup” practices for the assessment and remediation of oil and hazardous material disposal sites. The USEPA defines *green remediation* (or greener cleanups) as: “*The practice of considering all environmental effects of remedy implementation and incorporating options to minimize the environmental footprints of cleanup actions.*”

In 2008, Massachusetts enacted the Green Communities Act (GCA) and the Global Warming Solutions Act (GWSA). Together, these mandates prioritized a dramatic expansion in energy efficiency, the development of renewable energy resources in Massachusetts, and state-wide reductions in greenhouse gas (GHG) emissions. The promotion and application of green approaches for the assessment and remediation of oil and hazardous disposal sites is consistent with the Commonwealth’s mandates to improve energy efficiency, reduce emissions and expand the use of renewable energy resources where practicable.

REGULATORY AUTHORITY

MassDEP’s efforts to promote green approaches for the assessment and remediation of oil and hazardous material disposal sites in support of the Commonwealth’s energy and emissions mandates are reflected in the 2014 amendments to the MCP. The specific MCP amendments relevant to greener cleanups are part of the Response Action Performance Standard at 310 CMR 40.0191(3)(e) and the Detailed Evaluation Criteria for selecting a comprehensive remedy at 310 CMR 40.0858(4)(c). The relevant provisions, as amended, are excerpted below:

310 CMR 40.0191: Response Action Performance Standard (RAPS)

...

(3) The application of RAPS shall be protective of health, safety, public welfare and the environment and shall include, without limitation, in the context of meeting the requirements of this Contingency Plan, consideration of the following:

(e) eliminating or reducing, to the extent practicable and consistent with response action requirements and objectives, total energy use, air pollutant emissions, greenhouse gases, water use, materials consumption, and ecosystem and water resources impacts resulting from the performance of response actions through energy efficiency, renewable energy use, materials management, waste reduction, land management, and ecosystem protection.

310 CMR 40.0858: Detailed Evaluation Criteria

...

the remedial action alternatives identified by the initial screening shall be evaluated using the following criteria:

- (4) The comparative costs of the alternatives, including:
 - (b) costs of environmental restoration, potential damages to natural resources, including consideration of impacts to surface waters, wetlands, wildlife, fish and shellfish habitat; and
 - (c) *the relative total consumption of energy resources in the implementation and operation of the alternatives, and externalities associated with the use of those resources, including greenhouse gases and other air pollutants.*

PURPOSE

The purpose of this guidance is to support environmental professionals in their consideration and use of greener approaches for site assessment and remediation that eliminate or reduce the environmental footprint of cleanup activities to the maximum extent possible. The focus of such approaches includes addressing five core elements or factors for reducing the environmental footprint of a cleanup:

- Minimizing total energy use while maximizing the use of renewable energy;
- Minimizing emissions of greenhouse gases and other air pollutants;
- Minimizing water use and impacts to water resources;
- Reducing, reusing and recycling materials and waste; and
- Avoiding or reducing adverse impacts to ecosystems and land resources.

Greener cleanup approaches that maximize the net environmental benefits when conducting MCP response actions may be realized through use of practices described in the following readily available industry standards and guidance:

- United States Environmental Protection Agency (USEPA), August 2009, *Principles for Greener Cleanups* (US EPA Office of Solid Waste and Emergency Response)
- USEPA, August 2014, CLU-IN | Strategies & Initiatives | Green Remediation Focus (<http://clu.in.org/greenremediation/>)
- ASTM International, November 2013, *Standard Guide for Greener Cleanups*, E2893-13
- The Interstate Technology and Regulatory Council (ITRC), May 2011, *Technology Overview, Green and Sustainable Remediation: State of the Science and Practice* (GSR-1)
- ITRC, November 2011, *Technical/Regulatory Guidance, Green and Sustainable Remediation: A Practical Framework* (GSR-2).

While all of the standards and guidance listed above are helpful, MassDEP most strongly recommends the use of the *ASTM Standard Guide for Greener Cleanups* (“the ASTM Guide”) (Designation: ASTM E2893-13, November 2013). The ASTM Guide provides a defined process and technical protocols to help integrate greener cleanup considerations into any MCP response action. It includes both qualitative and quantitative options for reducing the environmental footprint of cleanups, including a robust list of Best Management Practices (BMPs) that can be readily implemented and an optional methodology for quantifying the environmental footprint or Life Cycle Assessment (LCA) of cleanup activities. In addition,

it includes procedures to promote transparency and public availability of information about the decision-making process and outcomes of greener cleanups.

APPLICABILITY

This guidance and the recommended use of the ASTM Guide apply to all assessment and remedial actions conducted at disposal sites under M.G.L. chapter 21E and the MCP.

While MassDEP encourages the application and implementation of approaches that maximize the net environmental benefit of the cleanup, such approaches must reflect MCP requirements for timely actions and remedies to eliminate, mitigate or prevent certain conditions, including an Imminent Hazard, a Condition of Substantial Release Migration, a Substantial Hazard and a Critical Exposure Pathway as these terms are defined and described in the MCP (310 CMR 40.0000). Greener cleanup considerations may not be used to override these or any other MCP requirements.

Further, MassDEP understands that time-critical situations where human health, public safety or the environment are at immediate risk (e.g., “2-hour” and “72-hour” reportable conditions under the MCP), likely are not suitable for initial consideration of greener cleanup practices. However, once immediate risks and their causes have been addressed, greener cleanup practices should be considered pursuant to the MCP as part of response actions that follow time-critical activities.

The ASTM Guide’s Section 1.0 similarly emphasizes that greener cleanup considerations do not supplant the need for timely action, stating that the *“guide should not be used as a justification to avoid, minimize, or delay implementation of specific cleanup activities. Nor should this guide be used as a justification for selecting cleanup activities that compromise stakeholder interests or goals for the site”* and the *“guide does not supersede federal, state, or local regulations relating to protection of human health and the environment. No action taken in connection with implementing this guide should generate unacceptable risks to human health or the environment.”*

In addition, neither this guidance nor the ASTM Guide supersede other applicable MassDEP regulations, guidance or policies in effect, and use of this guidance and the ASTM Guide must be compatible with them.

ADDITIONAL GUIDANCE ON USE OF THE ASTM GUIDE

MassDEP offers the following additional guidance on those items within the ASTM Guide that warrant emphasis or clarification:

- A. **Section 3.0 | Terminology:** The ASTM Guide contains terms and other language with technical and/or regulatory meanings. Whenever the ASTM Guide uses a term that has an equivalent MCP term, then the corresponding MCP term, definition, concept or language shall apply, with its ascribed regulatory meaning. For the specific purpose of this guidance, **APPENDIX A** lists key terminology found in the ASTM Guide, and provides corresponding definitions, explanations and, when available, equivalent MCP terms.
- B. **Section 4.2 | Professional Experience:** As specified by the ASTM Guide, its use by a *Lead Environmental Professional* is required. When conducting MCP Response Actions in adherence to this Guidance and the ASTM Guide, a *Lead Environmental Professional* applies only to the

Licensed Site Professional (LSP) of Record and/or, if applicable, another person under that LSP's supervision and who has relevant credentials and experience as defined in APPENDIX A. The Response Action Performance Standard, or RAPS as described at 310 CMR 40.0191, applies to any person conducting response actions required by M.G.L. c. 21E and the MCP.

- C. Section 4.6 | Process Overview: As defined by the ASTM Guide, the user should follow the process as described in the ASTM Guide if he or she intends to represent the assessment and cleanup activities as conforming with the ASTM Guide.
- D. Section 5.0 | Planning and Scoping: Section 5.0 of the ASTM Guide directs users to determine the applicability and implementability of the Guide to a specific cleanup phase(s) or response action(s). Also, in accordance with section 4.5, use of the ASTM Guide may be initiated at any time during any cleanup phase. Further, section 4.4.2 states that use of the ASTM Guide “may not be appropriate for certain cleanups, such as some emergency response actions.”
- E. Section 8.0 | Documentation and Reporting: Section 8.0 of the ASTM Guide includes specific documentation and reporting requirements. These include 1) documenting the process, 2) reporting the documentation to the public (either available for review at a public office or online), and 3) provision of a self-declaration statement affirming conformity with the process outlined in the ASTM Guide (section 8.3.2). (NOTE: This declaration is required by the ASTM Guide if the user intends to represent the assessment and cleanup activities as conforming to the ASTM Guide).

The ASTM Guide includes a Technical Summary Form (found in its Appendix X2) as a suggested template for providing the required information. MassDEP acknowledges that the majority of the information referenced in the ASTM Technical Summary Form is or may already have been captured in corresponding MCP response action reports and/or associated transmittal forms. In such cases, those MCP documents merely need to be referenced and it is then necessary to only document other items required by the ASTM Guide that are not already contained in the MCP response action submittal to which you elect to apply the ASTM Guide. For example, there would be no need to reiterate certain site specifics (such as its location, history, contaminants of concern and potential receptors) if that information is already included in your MCP response action submittal. The tables prepared as required by the ASTM Guide, which summarize the BMP process (e.g., opportunity assessment, prioritization, selection and implementation) as applied to a specific response action cleanup phase, can be incorporated into the corresponding MCP-required submittals within a complementary “greener cleanup” section in the body of the MCP report or provided in an appendix to the report.

SUSTAINABILITY: The social and economic benefits under the broader goal of “*sustainability*” and “*sustainable cleanups*” are not addressed by this MassDEP Guidance on Greener Cleanups. A sustainable cleanup seeks to maximize the social and economic benefits while also aiming for assessment and remediation of hazardous waste sites with reduced environmental footprints. The consideration and achievement of both social and economic benefits during a cleanup exceed the central M.G.L. chapter 21E and MCP mandates of protection of health, safety, public welfare and the environment. Therefore, a *sustainable cleanup* is beyond the required MCP considerations. However, MassDEP encourages parties conducting response actions to consider and include sustainable practices whenever possible and compatible with overall cleanup objectives (e.g., Brownfield site redevelopment). Parties choosing to pursue sustainable cleanups may wish to consult the document titled *ASTM Standard Guide for*

Integrating Sustainable Objectives into Cleanup (Designation: ASTM E2876-13), which can be used in combination with the *ASTM Standard Guide for Greener Cleanups* (as described in Section 1.6 of the ASTM Greener Cleanup Guide).

CASE STUDIES

At the time of publication of this guidance, case studies of greener cleanups based on sites located in Massachusetts were not available. MassDEP anticipates their inclusion in a future update to this guidance, once such case studies become available. MassDEP expects the case studies will help demonstrate the implementation and effective use of greener cleanup practices at Massachusetts sites. In the interim, four examples of greener cleanups from the state of Illinois are provided in **Appendix B**.

APPENDIX A | TERMINOLOGY

This list of terminology is issued for the specific purpose of this MassDEP Policy on Greener Cleanups, and is not a comprehensive list of terminology that may be encountered in the ASTM Guide. When available, the definition or equivalent terminology under the MCP or other applicable regulatory program, as noted, is identified.

ASTM Term/Language	Definition/Explanation
Activity and Use Limitation	As defined in 310 CMR 40.0006, and 40.1070 through 40.1099.
Applicable Guidance	Applicable policies and other guidance issued by MassDEP and/or other agencies with regulatory authority.
ASTM Cleanup Phases	Preliminary Response Actions (310 CMR 40.0400), <i>and</i> Comprehensive Response Actions (310 CMR 40.0800).
Cleanup Activities	Response Actions under 310 CMR 40.0000.
Cleanup Program	Massachusetts Contingency Plan (or MCP, 310 CMR 40.0000).
Documentation, Reporting, Timing and Public Availability	Must meet MCP requirements (for reporting, submittals, timelines <i>and</i> Public Involvement), and incorporate complementary “greener cleanup” information into MCP-required submittals.
Greenhouse Gases (GHGs)	As defined in M.G.L. c. 21N (Climate Protection and Green Economy Act): “Greenhouse gas,” is any chemical or physical substance that is emitted into the air and that the [respective state department with legal authority] may reasonably anticipate will cause or contribute to climate change including, but not limited to, carbon dioxide, methane, nitrous oxide, hydrofluorocarbons, perfluorocarbons and sulfur hexafluoride.

ASTM Term/Language	Definition/Explanation
Lead Environmental Professional	When conducting MCP Response Actions in adherence to this Guidance and the ASTM Guide, a <i>Lead Environmental Professional</i> applies only to the Licensed Site Professional (LSP) of Record, and/or, if applicable, another person under that LSP's supervision and who has relevant credentials and experience as defined below¹: a) A state or tribal issued certification or license and three years of relevant full-time work experience² (e.g., a Massachusetts Licensed Site Professional), or b) A Baccalaureate or higher degree in engineering or science from an accredited institution of higher education and has an equivalent of five years full-time relevant experience², or c) The equivalent of ten years of full-time relevant experience², or d) Works under the supervision or responsible charge of an individual who meets the requirements for a Lead Environmental Professional as described in a, b or c above. ¹From: US EPA, October 2005, "All Appropriate Inquiries Rule: Definition Of Environmental Professional." ²"relevant experience" means participation in the performance of environmental site assessments that may include environmental analyses, investigations, and remediation which involve the understanding of surface and subsurface environmental conditions and the processes used to evaluate these conditions and for which professional judgment was used to develop opinions regarding conditions indicative of releases of hazardous substances.
Release	As defined in 310 CMR 40.0006, and as used throughout MCP
Required Laws and Regulations	M.G.L. chapter 21E and MCP, and/or all other applicable laws and regulations
Site	As defined in 310 CMR 40.0006, and as used throughout MCP
State Number for Site	MassDEP Release Tracking Number (RTN)

APPENDIX B | CASE STUDIES

In 2013, partnering with the team developing the *ASTM Standard Guide for Greener Cleanups*, the Illinois Environmental Protection Agency (IEPA) collaborated with borrowers under IEPA's Brownfields Revolving Loan Fund program to pilot the ASTM Guide at four sites. The evaluation of response actions at these sites was based on ASTM's version of the Best Management Practices process at that time (*i.e.*, in the ASTM Guide March 2013 version). The four evaluated sites together with the links at which their corresponding reports are identified below.

- Chicago - Whitney Young Library (<http://www.epa.state.il.us/land/greener-cleanups/whitney-young.pdf>)
- Schaumburg - Murzyn Anderson property (<http://www.epa.state.il.us/land/greener-cleanups/murzyn-anderson.pdf>)
- South Beloit - Corner Parcel (<http://www.epa.state.il.us/land/greener-cleanups/corner-parcel.pdf>)
- South Beloit - Foundry Parcel (<http://www.epa.state.il.us/land/greener-cleanups/foundry-parcel.pdf>)

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