

# Editor's Perspective—US Sustainable Remediation Forum Pushes Forward With Guidance on the State of the Practice

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In the Summer 2009 issue of *Remediation*, the entire journal was dedicated to a single White Paper, “Integrating Sustainable Principles, Practices and Metrics Into Remediation Projects,” written by the US Sustainable Remediation Forum (SURF). At the time, this was a groundbreaking publication—the first of its kind—explaining in detail the overarching principles underlying the concepts of sustainable remediation. The publication has been widely cited and gained significant attention from regulators, the regulated community, and consultants. In fact, at the time of its release, Christine Todd Whitman, former governor of New Jersey and former US Environmental Protection Agency administrator, proclaimed the document “a watershed event in public policy deliberations about environmental remediation.”

Since the publication of the groundbreaking SURF White Paper, sustainable remediation has continued to gain significant momentum and is considered by many as one of the most prominent developments currently in the remediation field. As reported in a prior Editor’s Perspective (“Green and Sustainable Remediation—Fad or Revolution?” Winter 2010), the field of green and sustainable remediation (commonly referred to as GSR) is now a topic of research and publication by many entities, including:

- ASTM International, which is developing a standard guide on the subject;
- the US EPA, which has dedicated significant resources to various green remediation topics, as evidenced by its many publications and robust green remediation website ([www.clu-in.org/greenremediation](http://www.clu-in.org/greenremediation));
- the Interstate Regulatory and Technology Council, which has a Green and Sustainable Remediation Team that is planning to publish a guidance document on incorporating green and sustainable approaches to remediation projects;
- the Association of State and Territorial Solid Waste Management Officials, which has a Greener Cleanup Task Force that has published several guidance documents on green remediation from a state regulatory perspective; and
- many states, including California, Illinois, Wisconsin, New York, and Massachusetts, that have published guidance and policies on green and sustainable remediation.

As interest in sustainable remediation expanded, a common theme developed while practitioners delved into how it should be applied. As it turned out, sustainable remediation is not as much about using what many term as *green technologies* as it is about

the approach to a remediation project. In other words, the remediation industry discovered that sustainable remediation is not just the preconceived notion of solar- and wind-powered equipment, *in situ* bioremediation, renewable energy credits, and “green-collar” jobs. It is more than using green remediation technologies. In fact, it is the process of identifying the appropriate technologies to meet regulatory criteria and then incorporating sustainable practices in the remedy design, construction, implementation, monitoring, and optimization phases. This is not to discount the value of green and sustainable technologies and the relevance of technology to the subject, just to point out that employing technologies is only a part of sustainable remediation.

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As part of the earlier realization about the differences in the preconceived concept of sustainable remediation and the practical application of this developing field, SURF set out to assist the remediation industry by developing some key guidance documents. These documents, which *Remediation* is fortunate to be the first to publish in this issue of the journal, consist of the following:

- “Framework for Integrating Sustainability Into Remediation Projects,”
- “Guidance for Performing Footprint Analyses and Life-Cycle Assessments for the Remediation Industry,” and
- “Metrics for Integrating Sustainability Evaluations Into Remediation Projects.”

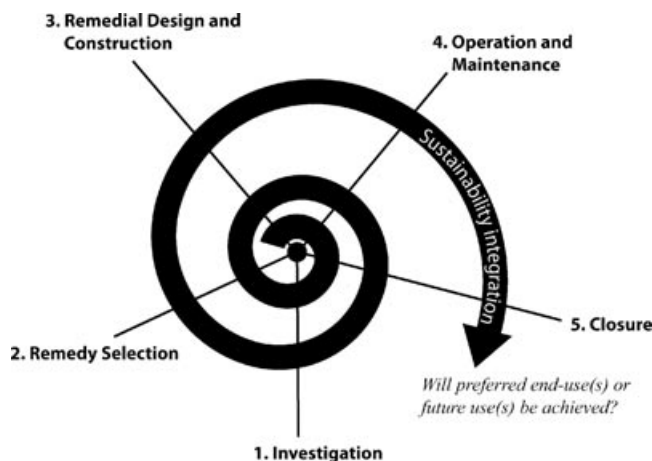
The thought and attention to detail in each of these guidance documents is a tribute to the efforts of the SURF organization, which is demonstrating itself to be a world-class leader in the subject of sustainable remediation. These documents set the stage for the rest of the industry to follow as the field continues to develop. A brief description of each of these documents is provided in the sections that follow.

## “FRAMEWORK FOR INTEGRATING SUSTAINABILITY INTO REMEDIATION PROJECTS”

“Framework for Integrating Sustainability Into Remediation Projects” identifies the process for a practitioner to follow when conducting a remediation project. The document describes how to systematically integrate sustainability into remediation projects. An important element of the Framework process is considering the end use of the property from the project’s inception. The Framework is a tiered process that:

- Enables involving either qualitative or quantitative assessments, or both;
- Describes how the conceptual site model should be updated to incorporate the results of the sustainability evaluation;
- Identifies and helps implement sustainability impact measures; and
- Involves sustainability with other considerations when making decisions during the remediation project.

A key element of the Framework document is that it is a process-based program that is overlain on the traditional goal-based regulatory requirements. The process does not replace the goal-based requirements of meeting regulatory standards while maintaining



**Exhibit 1.** Incorporation of preferred end-use or future use planning into the remediation project life cycle (Exhibit 5 of the Framework document)

compliance with regulations and technical practices but encourages systematic incorporation of sustainability principles throughout remediation projects.

Another important aspect of the sustainability concepts explained in the Framework document is developing a line of communication between the various stakeholders who may be affected by the remediation project. This practice ties into the process-based program in which collaboration with the community and other stakeholders is integrated into the process from the outset of the decision to incorporate sustainability concepts into the remediation project.

The greatest value from the Framework process is achieved by integrating the process into the remediation program at an early point, preferably before or at the remedial technology selection phase where sustainability can be considered in the decision-making process. This is visually depicted in an interesting exhibit from the Framework document that is repeated here (Exhibit 1). The guidance also has a strong preference for considering how the remediation program will eventually be transitioned to a future use of the site.

## “GUIDANCE FOR PERFORMING FOOTPRINT ANALYSES AND LIFE-CYCLE ASSESSMENTS FOR THE REMEDIATION INDUSTRY”

SURF’s “Guidance for Performing Footprint and Life-Cycle Assessments for the Remediation Industry” is the first publication that describes, in detail, the steps a remediation practitioner should follow when conducting a life-cycle assessment (LCA) or environmental footprint analysis (FA). The document lays out a nine-step process for conducting either an LCA or environmental FA.

The difference between an LCA and an FA is that an LCA considers the full life cycle of a remediation project phase—considering a comprehensive evaluation of the inputs and outputs of the project activities. Depending on the LCA boundaries, the environmental (and possibly social and economic) consequences of the various products used and activities proposed that may consist of fuel depletion, water depletion, ecosystem damage and improvement, and other impact categories are quantified. This typically includes the impacts of the production or manufacturing of the products and supplies used and

transportation of the materials to the project site. Similarly, the holistic impacts of treatment of wastes generated are quantified. The metrics representing the various impact categories are then summed, and different remedies or variations of a single remedy can then be compared.

An FA is more streamlined than an LCA and may only focus on certain elements of a remedy, such as water use, energy use, climate-change potential, air emissions, or material use. The inputs for an FA are not collected in as rigorous fashion as in LCA and may even be from industry sources. Thus, an FA can be conducted with less time and effort and typically would not require a LCA specialist, although that would be a benefit.

The use of the LCA/FA guidance can assist in identifying how the sustainability of a project phase may be improved by highlighting the greatest impacts of a proposed project phase.

There is an entire science and methodology to conducting LCA projects. These are discussed in two ISO standards, ISO 14040 and ISO 14044, which both address LCA. However, these standards apply to LCAs in general terms across many different disciplines. Although these standards can be applied to a sustainable remediation project, they were not developed specifically for this purpose and, thus, different LCA specialists may approach the assessment of sustainable remediation projects differently even if they were following the ISO LCA standards. SURF incorporated the ISO standards in the development of the LCA/FA document.

The use of the LCA/FA guidance can assist in identifying how the sustainability of a project phase may be improved by highlighting the greatest impacts of a proposed project phase. In addition, the process can be used to compare different remedial alternatives during the remedy selection or remedy optimization phases of a project.

The LCA/FA document offers remediation practitioners a consistent, systematic process to follow that is repeatable and documented. Undoubtedly, the guidance document will form the basis for project scopes of work and contractual language for sustainable remediation in the future. For example, a project bid document could possibly reference the LCA/FA guidance as a project requirement and then go on to become part of the scope of work that a consultant must follow when performing specified phases of a remediation project.

## “METRICS FOR INTEGRATING SUSTAINABILITY EVALUATIONS INTO REMEDIATION PROJECTS”

“Metrics for Integrating Sustainability Evaluations Into Remediation Projects” describes a robust compilation of metrics that can be accessed from the SURF website by the remediation community and other interested parties (a SURF membership is not required to access the documents). The authors refer to the compiled metrics as the “Metrics Toolbox.” SURF defines metrics as “key impacts, outcomes, or burdens that are to be assessed or balanced to determine the influences and impacts of a remedial action.”

The Metrics Toolbox is a series of tables organized by project phases: remedial investigation, remedy selection, remedial design, remedial construction, operation and maintenance, and closure. For each metric there are several designations and descriptions related to the parameter to be measured, including whether the metric is quantifiable or qualitative; the metric's applicability to the environmental, social, or economic aspects of a project; potential data sources for the metric; and information on implementation guidance, external benefits, and challenges associated with the metric.

Examples of metrics in the guidance are climate-change potential, fossil-fuel depletion potential, air-acidification potential, human toxicity potential, particulate matter formation potential, use of virgin material, and quantity and cost of fuel use. The individual metrics are parameters to be measured and, as such, they may not have a specific management practice associated with them listed in the compilation.

The Metrics Toolbox will be posted on the SURF website at [www.sustainableremediation.org/library/guidance-tools-and-other-resources](http://www.sustainableremediation.org/library/guidance-tools-and-other-resources). SURF intends to update the tables on an ongoing basis as a greater understanding of the metrics involved with sustainable remediation is developed.

## SUMMARY

SURF plans to continue publishing additional guidance documents in the future to assist practitioners in conducting sustainable remediation projects. However, the three documents published in this issue of *Remediation* will form the basis of this particular aspect of the industry for years to come. The documents are likely to be referenced in other guidance documents, such as the ASTM standard guide that is currently being drafted, and, as mentioned earlier, could become incorporated into the scopes of work for sustainable remediation projects.

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