

| Tool Name (Sponsor) | Tool Description | Tier | Triple Bottom Line Elements | | |
|---|---|---------|-----------------------------|----------|----------|
| | | | Environment | Societal | Economic |
| <i>Tools Developed by Government Entities</i> | | | | | |
| <p>Sustainable Remediation Tool (SRT)</p> <p>(Air Force Center for Engineering and the Environment)</p> | <p>The SRT is a publicly available, free, MS Excel®-based tool designed to help plan for remediation technology implementation at a particular site, compare remediation approaches on the basis of sustainability metrics, and evaluate the optimization of remediation technology systems already in place. The SRT allows users to evaluate sustainability metrics for specific remedial action technologies for soil and groundwater. While the SRT is intended for U.S. Air Force remediation practitioners, it can be used by anyone considering sustainability elements during remedy selection or remedial system optimization. The SRT can be downloaded at http://www.afcee.af.mil/resources/technologytransfer/programsandinitiatives/sustainableremediation/srt.</p> | 1, 2, 3 | yes | yes | yes |
| <p>SiteWise™</p> <p>(Battelle, U.S. Navy, and U.S. Army Corps of Engineers)</p> | <p>SiteWise™ is a publicly available, free, MS Excel®-based tool designed to help remediation practitioners calculate the sustainability footprint of common remedial alternatives. SiteWise™ provides a detailed assessment of several quantifiable sustainability metrics, including greenhouse gases, energy usage, criteria air pollutant emissions, water usage, and accident risk. SiteWise™ can be downloaded at http://www.ert2.org/t2gsrportal/SiteWise.aspx.</p> | 1, 2, 3 | yes | yes | no |
| <p>Green Remediation Evaluation Matrix (GREM)</p> <p>(California Department of Toxic Substances Control)</p> | <p>The GREM is a publicly available, free tool that was introduced in the California Department of Toxic Substances Control <i>Interim Advisory for Green Remediation</i> (http://www.dtsc.ca.gov/OMF/upload/GRT_Draft_-Advisory_-20091217_ac1.pdf). The GREM enables remediation researchers and practitioners to perform comparisons of remediation alternatives. The Interim Advisory references other tools that can be used for calculating sustainability impacts. The GREM can be downloaded at http://www.dtsc.ca.gov/omf/grn_remediation.cfm.</p> | 1, 2 | yes | yes | yes |

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| <p>Greener Cleanups: How to Maximize the Environmental Benefits of Site Remediation</p> <p>(Illinois EPA)</p> | <p>This matrix is a publicly available, free tool designed to help remediation practitioners select sustainable practices that can be applied to site assessment, planning and design, and cleanup. The matrix lists individual actions, followed by a qualitative ranking of difficulty level and feasibility (subcategorized by cost, schedule, and technical complexity). The benefits of each action to air, water, land and energy are also identified. The matrix can be downloaded at http://www.epa.state.il.us/land/greener-cleanups/.</p> | 1, 2 | yes | no | no |
| <i>Tools Developed by Remediation Industry Service Providers</i> | | | | | |
| <p>AECOM Holistic Tool</p> <p>(AECOM)</p> | <p>The AECOM Holistic Tool estimates sustainability metrics relevant to the evaluation of the following remedial technologies: excavation, transportation, sediment dredging, capping, landfarming, sheet pile wall installation, thermal desorption, slurry wall installation, in-situ thermal treatment, in-situ stabilization and solidification, and jet grouting. The tool allows the estimation of the following set of metrics: energy consumption, air emissions, and workplace accidents. The tool consists of an analytical model built on a MS Excel® platform and provides an easy-to-use mechanism to quantify sustainability metrics for remediation activities.</p> | 1, 2, 3 | yes | yes | no |
| <p>BalancE3™</p> <p>(ARCADIS)</p> | <p>BalancE3™ is a quantitative tool used to evaluate and incorporate different sustainable remediation approaches during remedy evaluation, selection, and design on a site-specific or portfolio-wide basis. BalancE3™ aggregates diverse sustainability metrics; provides the flexibility to prioritize any combination of eight metrics (energy, air emissions, water requirements, land impacts, waste generation and material consumption, stewardship, health and safety, and life-cycle costs) for a given analysis; applies statistical methods to facilitate alternatives comparison; and identifies key metrics to improve remedies through the practical application of greener remediation concepts.</p> | 1, 2, 3 | yes | yes | yes |

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| <p>Sustainable Remediation Assessment and Methodology</p> <p>(CH2MHILL)</p> | <p>The Sustainable Remediation Assessment and Methodology lists categories of potential impacts and a range of subcategories to allow the impacts associated with environmental remediation projects to be quantitatively and/or qualitatively evaluated. A total of 102 subcategories can be mapped to each of the categories. Once the listing of impacts and mapping is complete, stakeholders use a decision tool to determine the relative importance of each impact category. With the estimated impacts and decision category weighting, remediation practitioners assess the overall relative sustainability impacts of a project or range of alternatives. The methodology is capable of reporting on uncertainty and performing Monte Carlo analysis of uncertain parameters so decision makers understand the impact of critical parameters on their overall decision.</p> | 1, 2, 3 | yes | yes | yes |
| <p>GoldSET-CN-SR</p> <p>(Golder Associates in partnership with Canadian National)</p> | <p>GoldSET-CN-SR is a multi-criteria decision analysis tool that allows sustainable development principles to be embedded into projects using a number of key indicators and variables and interactions of sustainability analyses to be summarized in easily understood graphics. The tool provides a standard set of qualitative and quantitative indicators for site remediation and the flexibility to edit, add, and remove indicators depending on the project. Multiple users can collaborate on a project, and an energy and greenhouse gas calculator is included. A public version of GoldSET-CN-SR will be available in the fourth quarter of 2011. Additional information can be found at www.gold-set.com.</p> | 1, 2, 3 | yes | yes | yes |
| <p>Sustainable Remediation Evaluation Tool</p> <p>(Haley & Aldrich, Inc.)</p> | <p>The Sustainable Remediation Evaluation Tool allows sustainability impacts of different remediation scenarios to be evaluated throughout a remediation project life cycle and provides recommendations to enhance positive impacts and reduce negative sustainability impacts. By using the tool, stakeholders can “see” the sustainability impacts of their operations, determine the most significant sustainability impact drivers, understand how sustainability performance indicators are interconnected, and identify the sustainability performance improvements that provide the most value.</p> | 1, 2, 3 | yes | yes | yes |

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| Sustainability Impact Estimator (URS Corporation) | The Sustainability Impact Estimator allows the sustainability of remedial actions to be evaluated through the assessment of the manpower and materials consumed by the activities (e.g., mobilization, transportation, drilling, excavation) inherent in the remedial action. | 1, 2, 3 | yes | yes | yes |

Note:
 This table provides a snapshot of sustainable remediation tools at the time of publication. Additional tools are likely to become available following publication of this document. Additionally, the list of tools is not exhaustive. Although SURF does not endorse a specific tool, it recognizes the value of the different tools in performing different types of evaluations.