# A Sustainability Decision Support Tool for Site Remediation in Canada

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A comprehensive analytical framework to support sustainability assessments can lead to sound business and engineering decisions, decisions in which principles and corporate policies on sustainable development can be implemented at the project level. This process means that the assessment of the various sustainability issues in a project will be synthesized in order to facilitate the trade-offs leading to optimized decisions. This process will enhance the understanding of the sustainability issues, which will, in turn, position the project proponents so that they can engage more proactively with their stakeholders, better manage their risks and ultimately improve the overall performance of their project. Such an evaluation process needs to be:

- Easy to understand and communicate;
- Defensible and transparent to the stakeholders;
- Flexible so that both quantitative and qualitative information can be processed;
- Balanced in regards to the sustainability principles;
- Specific to the organization; and,
- Pragmatic so that it can support sound business decisions.

In Canada, the legislative authority over contaminated sites is primarily the jurisdiction of the provinces and territories. Federal environmental legislation aims at preventing the creation of contaminated sites.

In 2004, the Federal Government announced a commitment of $3.5 billion over the next 15 years to address federally owned contaminated sites. The Federal Contaminated Sites Action Plan (FCSAP) was established to systematically address these sites. Under this plan, federal departments, agencies and consolidated crown corporations submit their projects for consideration. The projects are ranked according to their risk to human health and the environment, and funding is allocated accordingly to allow custodians to assess, remediate and/or risk manage their sites.

The Government of Canada embeds more and more sustainable development principles in the day-to-day management of its Governmental Agencies. The 1995 modifications to the *Auditor General Act* require that the Ministries prepare sustainable development strategies. The Ministries are then required to establish sustainable development strategies and to propose them to Parliament.

The *Federal Sustainable Development Act* received Royal Assent on June 26, 2008. This act reinforces the sustainable development practices within the Federal Government. It requires the appointment of a sustainable development advisory council to advise the Government of Canada on the federal strategy related to sustainable development and the creation of a new office within Environment Canada to elaborate and monitor the strategy's progression. The Federal strategy will also include federal SD goals and objectives as well as implementation strategies for each objective. Environment Canada is mandated by the Government to implement the SD Act and to elaborate the federal sustainable development strategy that has to be proposed to Parliament in June 2010.

The federal government bases itself on international trends for integrating SD principles in contaminated sites management. To that effect, it is developing decision support tools that integrate these principles.

Golder Associates Ltd ("Golder") has developed a sustainability decision support tool to evaluate the strengths and weaknesses of projects with respect to environmental, social, economical as well as technical dimensions. The tool called GoldSET©[1] (Golder's Sustainability Evaluation Tool) tries to allow for an unbiased comparison of different options on the basis of sustainability principles. As such, it can help identify optimal solutions in a decision-making process based on the principles of sustainable development. This sustainability analysis results in a "triple-bottom-line" assessment, expanding the traditional analytical framework from financial performance to environmental, social and economical performance. Based on GoldSET©, Golder has been mandated by Public Works and Government Services Canada (PWGSC) and Environment Canada (EC) to develop a specific sustainability decision support tool (SDST) in order to encourage federal departments, agencies and consolidated Crown corporations to take into account the environmental, social and economic issues in their remedial project planning. The SDST is a multi-criteria analytical (MCA) framework to support sustainability assessments. It is used to "operationalize" the principles of sustainable development into engineering projects. The basis for the SDST is to support the evaluation process in order to make sure that the proper recommendations would be made, while including various sustainability principles. To do so, it is designed to address economical, social and environmental impacts, direct and indirect, positive and negative, short and long term.

The tool includes qualitative, generic and quantitative indicators. All indicators have a related description to define their boundaries. As part of this project, sustainability indicators were selected based on the objectives, needs and characteristics of the Federal Contaminated Sites Action Plan (FCSAP), governmental sustainability strategies and completed by a review of international guidelines and scientific references. With these indicators, the SDST was developed in order to help managers decide on the most sustainable remedial options through the evaluation of environmental, social, and economic impacts.

The purpose of this sustainability decision support tool is to offer an analytical framework which simplifies the management of complex sustainability issues involved in projects. By providing a comprehensive and transparent framework to understand and manage the sustainability issues of a project, the sustainability decision support tool can achieve the following benefits:

- Improve the decision-making process involving complex issues;
- Support proactive stakeholder engagements through a rigorous and transparent evaluation process allowing stakeholders to better understand the alternatives and their respective impacts;

- Ease communication with communities through visual representation of performance with respect to sustainable development and in return facilitate the issuing of social licences for project operations;
- Optimize the comparison of alternatives by providing a framework which allows different options to be compared with a set of key criteria and trade-offs leading to a facilitated decision-making process; and,
- Improve corporate image by supporting decisions with a sustainability framework that effectively demonstrates a corporation's willingness to move forward with sustainable development, and can consequently promote a positive corporate image.

Major remediation projects face interconnected and complex technical, economical, social and environmental challenges. In this context, the use of a sustainability decision support tool can achieve important benefits.

The presentation will focus on the selection and construction of sustainable indicators, the weighting module and examples of output of the SDST, tables, figures and graphs showing the global sustainable performance of each technology assessed. Further validation of the selection of indicators and the establishment of generic and semi-generic scores for the selected technologies as well as some pilot tests are currently underway.