

2022 Americas Site Solutions Technology Transfer Conference

Title: Remedial Alternative Sustainability Evaluation During a Feasibility Study

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Key Topic: Sustainable Solutions

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Project Name: Former Manitowoc MGP

Project Location: Manitowoc, Wisconsin

Primary Ramboll Project Staff (Office): Chicago, Illinois and Milwaukee, Wisconsin

ABSTRACT

Background/Objectives:

A Remedial Alternatives Sustainability Evaluation was performed as a part of a Feasibility Study (FS) addressing sediment impacts associated with a former manufactured gas plant (MGP) in Wisconsin. The objective of the evaluation was to quantify sustainable remediation metrics in the FS remedy evaluation process, focusing on the short-term and long-term effectiveness National Contingency Plan (NCP) criteria. The evaluation used a net benefit of sediment remedial alternatives approach to evaluate and compare capping, dredging, and in situ solidification/stabilization (ISS). The evaluation also made it possible to compare different remedial goals. In a subsequent iteration of the FS, the sustainability evaluation was expanded to include an evaluation of differences in community impacts and environmental impacts associated with two preliminary remedial goals (PRGs) for total petroleum hydrocarbon (TPAH 13).

Approach/Activities:

SiteWise™ software was used to calculate key metrics, such as truckloads to and from the site during remediation, greenhouse gas (GHG) emissions, energy consumption, and emissions of sulfur oxide, nitrogen oxide, and particulates. SiteWise™ is an open-source, excel-based software program developed by the Naval Facilities Engineering Command (NAVCAC), United States Army Corps of Engineers (USACE), the US Army, and Battelle. Remedial areas and volumes for each alternative were input into SiteWise™ to calculate the metrics identified above. In addition, C-Tech Earth Volumetric Studio™ (EVS) was used to quantify contaminant mass removed or treated with each alternative. The SiteWise™ sustainability metrics (GHG and other emissions and energy consumption) were presented along with remediation costs and the mass of contaminants removed for each alternative, for sustainability comparisons.

Results/Lessons Learned:

This evaluation provided quantitative data to support discussion of the short-term and long-term effectiveness balancing criteria in a project FS that compare dredging, capping, and ISS remedies for a former MGP site. The sustainability evaluation was used to support the comparison of remedial alternatives, along with more conventional comparisons based on mass of contaminant removed, cost, and remedy effectiveness. For the dredging scenario, contaminated mass removed increased <5% when adjusting from the higher PRG to the lower PRG, while truckloads, GHG emissions, energy consumption, and emissions increased between 64% and 85%. In this evaluation, both ISS and a hybrid dredge/cap alternative showed fewer short-term effects relative to full-scale dredging. This presentation will discuss the efficacy of a remedial alternative sustainability evaluation to support environmental decision-making within the NCP's FS process. This type of evaluation also can provide value earlier in the remedy evaluation process, such as during the development of PRGs, to assess the net benefit of lower PRGs. Further, the evaluation can be refined during design to ensure that the sustainability remediation metrics that influence remedial alternative selection are maintained throughout remedial design process, and into construction; sustainability metrics can be tracked

during construction to provide real-time information on remedy performance, helping to improve the accuracy of future Remedy Alternative Sustainability Evaluations.

Aspect of Work that Relates to Sustainability:

Evaluate sustainability as a part of remedial alternative evaluation.