Understanding the Impact: Evaluation of Footprint Reduction Achieved with Adaptive Site Characterization

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Background/Objectives. Sustainable best management practices (SBMPs) are considered a foundation in implementation of sustainable resilient remediation solutions. The components of implementation that make up adaptive site characterization are included in the SBMP list published by the United States Environmental Protection Agency (USEPA), ASTM, and CL:AIRE. Having these practices established in the SBMP list facilitates decision-making during the planning process. The challenge lies in understanding the impact of greener approaches on the implementation footprint. The effort required to perform footprint quantification is site-dependent. While SiteWise™ has made performing the calculations easier, the lack of regulatory drivers to perform quantification often results in a lack of performance.

The goal of this study is to better understand the impact of SBMP implementation, specifically those components considered to be part of adaptive site characterization, through footprint quantification. The objective of the study is that the relative reduction in footprint can be better understood as a percentage of effort to aide decision-making during investigation design, and guide efforts to track remediation footprints.

Approach/Activities. This case study will provide an overview of remediation footprint associated with site investigations, including but not limited to the following metrics: greenhouse gas emissions, energy consumption, material consumption, waste generation, water consumption, and social aspects. These realized site-specific impacts will be calculated for investigations implemented using adaptive approaches including limited mobilizations, use of a mobile laboratory, targeted data collection strategies to obtain data that are "fit for purpose", and integration of digital tools and dynamic workplans to facilitate stakeholder engagement and modification to plan. Dynamic investigations will then be compared to investigations conducted at the same facilities performed using more traditional approaches including: establishing an investigation footprint targeting delineation, mobilizing and performing the work, demobilizing and receiving data in 3 to 4 weeks that is then validated, analysis of the data to determine if delineation and characterization was achieved, and informing the stakeholders via reporting within a 6- to12-month timeframe. The main components of each approach that will be compared will include factors such as the number of mobilizations to achieve characterization, total time in field across all mobilizations, waste creation and disposal, and total time to receive stakeholder acceptance and move forward to options appraisal. Results will be evaluated considering relevant site and COC information. The pair comparisons will then be evaluated across a portfolio to establish footprint trends, drivers and key considerations.

Results/Lessons Learned. This presentation will provide key lessons learned for improving the footprint of investigations associated with remediation and identify relative quantification of investigation footprints to the size of an investigation to help determine case-specific breakpoints for qualitative and quantitative evaluation.