

LEAN Approaches to the Remediation Process

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Background/Objectives. In 2017-2018 Azimuth1, with support from the National Science Foundation, researched the process difficulties and challenges in site characterization and preparation for remediation. We sought to understand the processes used and what we could learn from the experiences of a large number of professionals in the field, in both industry and government.

Approach/Activities. After conducting nearly 100 in-person and video interviews with consultants, engineers, and state and Federal regulatory personnel, we compiled data on the state of the site characterization and remediation process, viewpoints on the biggest challenges and ideas on solutions. Azimuth1's poster presentation will relay the findings from these interviews to answer the biggest question: What bugs us about the most this process? The questions we used to guide our discussions were aimed at understanding three aspects of the process: 1) Impediments to 'flow' in the system – the continuous and steady progression of investigation remediation and closure of sites. What events or situations create bottlenecks and block the efficient flow in the process. 2) Quality of site characterization leading to revisits and incomplete remediation, and 3) The uncertainty in the total cost in terms of time and total expense and what factors lead to that uncertainty. As we had these discussions with experts, we noticed parallels with the principles of LEAN production and began matching the inefficiencies in the remediation process to inefficiencies in the manufacturing and production process, giving the opportunity to learn from prior art in how to overcome problems and add value. Work developed from the Toyota Production System became Lean production, Six Sigma, and other management systems. We took the process of discovering, prioritizing, funding, investigating, and remediating, monitoring, and closing contaminated sites and gave it the LEAN treatment to see what we could learn. We are happy to share our findings and welcome discussion and improvements on this ongoing work.

Results/Lessons Learned. The data collection and interview process is ongoing, but we present the current findings in the context of LEAN production disciplines from manufacturing and process optimization. This presentation pairs the biggest struggles identified by the industry with the benefits of LEAN production, including the concepts of one-piece-flow, standardization, continuous improvement, and techniques for removal of waste in a process. The impressions from industry and regulators are both included, and where they agree (and disagree) are areas where we can invest in process improvements throughout the funding, prioritization, planning, and execution of remediation.