

A Consideration of the Benefits of Various Field Procedures When Applying Enhanced Reductive Dechlorination

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Background/Objectives. Over the last several decades, the application of biologically enhanced reductive dechlorination (ERD) for in situ treatment of chlorinated organics has advanced from an academic study to an innovative technical process, to a now, well-understood and generally accepted remedial approach. Early on, application of ERD understandably followed meticulous adherence to procedures that removed any potential risk of adversely affecting the approach. Because the application was not well documented in the field large amounts of often costly data were collected and analyzed to evaluate these processes and to demonstrate how the degradation process was occurring. Over the last couple of decades, thousands of successful ERD, and many unsuccessful, applications have been conducted and the biogeochemical processes that occur during ERD have been well defined. ERD was found to be a very robust approach that followed generally well-defined processes. During this time, numerous field techniques have developed to maximize the application and effectiveness of the process. ERD has subsequently moved from a science to an art.

The application of ERD now often takes a more pragmatic approach to optimizing the conditions that will assure achievement of the remedial goals in a cost-effective manner. Rather than collecting large amounts of costly data to define all the processes occurring, data collection and analyses are prioritized to meet the goals and budget of the project. Some data that were previously required may still be necessary, however, some are just useful or interesting, and some may not be necessary or are not used at all. Likewise, some field procedures may be only marginally more effective than easier or less costly procedures in achieving the remedial goals. The object of this presentation is to identify which field methods and analytical requirements that are necessary, optimal or sufficiently acceptable for application of ERD.

Approach/Activities. The common practices conducted to effectively implement ERD in the field will be identified and described. These practices include various substrate determination methods, various field application techniques, bioaugmentation procedures and analytical requirements. The major benefits and limitations of these approaches are identified with the goal of identifying those which are necessary, and those which provide various, decreasing levels of benefit.

Results/Lessons Learned. The practice of ERD is a well understood technology that has been successfully applied at thousands of sites over the last decade. During this time the numerous techniques for applying and evaluating these projects has become well understood. Some of the procedures and practices conducted early in the development of this technology may not be necessary at this later stage of the technology application. This presentation will discuss the common practices applied in the field when applying enhanced biological reductive dechlorination and will focus on the level of effort to apply those and the level of benefits of conducting these practices.