

ITRC PROJECT PROPOSAL: IN SITU STABILIZATION AND SOLIDIFICATION

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Proposal Contact:

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Problem Statement

The lack of readily-available and cost-effective technical performance measures to assess In Situ Stabilization (ISS) technology effectiveness and the lack of a consistent regulatory approval process from state-to-state, and even within the same state, and from EPA Region-to-Region is a barrier to the use and development of these technologies. This inconsistency and lack of standard approaches results in case-by-case development of acceptable criteria, which is very costly and time-consuming. Stabilization of soil containing inorganic contaminants is a mature technology and has become acceptable because the stabilizing compounds cause an irreversible chemical change to more insoluble forms of the contaminant. The lack of an accepted standard performance measure has been overcome at many sites. However, ISS of soil with organic contamination includes a variety of approaches, ranging from solidification to encapsulation. Some of these approaches do not cause a permanent change, but serve to reduce the mobility of the contamination. An acceptable test method is needed to determine the effectiveness of the stabilization, both in the short-term and the long-term. One of the major goals of this team will be to establish and review the circumstances under which this technology produces acceptable results.

As indicated earlier, stabilization of soil contaminated with inorganic contaminants is a demonstrated and accepted technology. Stabilization of soil contaminated with organics has only been selected as a possible remedy recently and may be the technology of choice when other remedies are impractical or not cost-effective. For example, ISS can address concentrated sources of organic contamination that are recalcitrant to treatment with other in situ technologies and perhaps even NAPL. New York and other states have begun selecting ISS as a remedy for contaminated soils at manufactured gas plant (MGP) sites that cannot be addressed by excavation or other remedial alternatives (such as a barrier wall with NAPL collection), but there remains uncertainty regarding how to measure its effectiveness. The intent of this work is to provide an accepted performance measure to allow ISS technology to be evaluated on an even footing with other potentially applicable technologies.

One of the comments on the pre-proposal indicated that it duplicates EPA's web based document: "Soil Remediation, Revitalization, and Reuse: Technical Performance Measures". While EPA's effort is somewhat similar, the web based document does not address reduction in mobility (it is not one of the goals) which is the major question with regard to stabilization of soil contaminated with organics. However, the work done by EPA may be very useful in the proposed effort.

Solution / Impact

Participation of state and federal regulatory representatives and private sector stakeholders in the joint development of ISS guidance will provide a more consistent approach to evaluating the applicability and effectiveness of ISS for sites and will provide site owners with confidence that the feasibility assessment measures undertaken for a particular management scenario are following an approach recognized by regulators nationwide. The availability of this guidance and training will save agencies and site owners time and cost in the evaluation and implementation of ISS technologies.

Success Measures

- Number of decisions influenced by project products;
- Number of new technology deployments;
- Number of states concurring on technical and regulatory guidance document;
- Number of sites utilizing team products.

Summary of Deliverables

- Develop a recommended protocol for conducting treatability assessments, based on the latest research and experience, including leachability test methodologies and using leaching test results to determine impacts/improvements to groundwater. Depending on the preferences of team members, the effort may focus on organic contamination rather than inorganic contamination but the deliverable will have crossover applicability.
- Develop and obtain multi-state consensus on a technical and regulatory guidance document, including technical performance measures and long term monitoring to assess ISS technology effectiveness for organic and inorganic contaminants, including free and residual product.
- Develop an ITRC Internet Training Module based on the above.

Project Schedule

Year 1: Develop protocol for conducting treatability assessments per above.

Year 2: Develop Technical and Regulatory guidance document per above.

Year 3: Develop an ITRC Internet Training Module based on the above.

Target Audience

- Utilities – Coal gas sites, refineries
- Manufacturing – waste lagoons, sludges, contaminated soils
- DOD – Small arms ranges, ammunition, industrial disposal, machining
- DOE - Uranium mine tailings, industrial disposal sites, radioactive disposal sites, metals in soil
- Mining – Mine tailings, mill tailings, overburden at less than ore grade, acid mine drainage
- State/federal – broad national applicability for sites with organic and inorganic contaminants, including free and residual product in soils and sediments

Resources Required

Personnel:

- To date, the following States have expressed interest in an ISS Team: NJ, PA, IN, NE, NY, VT, TX, ND, OR, SC, DE, WY, and NY has tentatively committed to lead the team.
- The team will be populated with the appropriate skill mix of Team Members (e.g., regulatory, engineering, scientific, etc.) and with federal regulators and public stakeholders.

Related Work:

- EPRI-funded research on leachability studies.
- In Situ Stabilization/In Place Inactivation, ITRC document MIS-3, 1997.
- Metals in Soils, Technology Status Report: Soil Washing and the Emerging Technologies of Phytoremediation, Electrokinetics, and In Situ Stabilization/In Place Inactivation, ITRC document MIS 6, 1998.