EPA SITE Program:
Facilitating Technology Transfer
and Regulatory Acceptance

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Program Background:

Congress expressed concern over the use of land-based disposal and containment technologies to mitigate problems caused by releases of hazardous substances at hazardous waste sites. As a result of this concern, the 1986 reauthorization of CERCLA, called the Superfund Amendments and Reauthorization Act (SARA), mandates that EPA "select a remedial action that is protective of human health and the environment, that is cost-effective, and that utilizes permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable." In response to this requirement, EPA established a formal program to accelerate development, demonstration, and use of new or innovative technologies for site cleanups. This program, known as the Superfund Innovative Technology Evaluation (SITE) program, has four goals:

- Identify and, where possible, remove impediments to development and commercial use of alternative technologies
- Conduct a demonstration program of the more promising innovative technologies to establish reliable performance and cost information for site characterization and cleanup decision-making
- Develop procedures and policies that encourage selection of available alternative treatment remedies at uncontrolled hazardous waste sites
- Structure a development program that nurtures emerging technologies

The Program

The objectives of the SITE Program are to conduct field demonstrations and high quality-performance verifications of innovative treatment and characterization technologies on sites that meet the following criteria: pose a high risk to human health and/or the environment; are common throughout a region or nationwide; or where existing methods are inadequate or too costly. Providing credible, unbiased cost and performance data remains the strong foundation of SITE. The resulting data and reports are intended for use by decision-makers in selecting treatment options and for increased credibility in innovative technology applications.

The demonstration and evaluation process yields the following information about the technology by assessing sampling and analytical results and other available and verifiable information:

- Effectiveness of the technology in treating target contaminants
- Potential need for pre- and post-treatment processing of raw and treated materials
- Site-specific wastes and media to which the technology can be applied
- Potential site-specific system operating problems and their possible solutions
- Approximate capital, operating, and maintenance costs
- Projected long-term operating and maintenance costs

Partnerships for Success

SITE Program technology demonstrations are increasingly conducted in partnership with other federal agencies, states, private industry, and universities that have common environmental problems. These partnerships not only reduce the overall costs of demonstrations to EPA, facilitate regulatory acceptance but accelerate remediation of hazardous waste sites.

The SITE Program recognizes the importance of cooperation between federal and state agencies to find common areas of need and interest. Federal to federal interface is an important aspect to enhancing the benefits of technology demonstrations. It allows for leveraging of resources, expedited cost and performance information exchange and cross fertilization of technical expertise between agencies. In common environmental areas of interest this type of joint research is of great benefit to all parties involved.

One example of this type of approach is the Interagency DNAPL Consortium (IDC). The IDC at the Cape Canaveral site is comprised of EPA, DOE, DOD and NASA. The objective of the group is to conduct side-by-side demonstrations of 3 innovative technologies for DNAPL remediation. The SITE Program will provide the independent cost and performance evaluation. DOE and the Air Force are combining resources to contract the technology vendors and NASA is providing the site and in-kind services. NASA plans to use successful demonstration results as a basis for selecting the appropriate technology for remediating Launch Complex 34. Florida DEP and the EPA Region IV offices are also participating in technical test plan technical reviews and addressing permit issues.

It is equally important to have federal to state interactions as it is to have federal to federal cooperation. The Interstate Technology and Regulatory Cooperation (ITRC) Workgroup provides a mechanism to interact with multiple state regulatory agencies and state specific verification programs. Direct interaction with multiple state agencies provides many benefits. Interaction among multiple states on SITE Projects can result in multiple technical issues being addressed in one field demonstration. This reduces duplication of field demonstrations to answer

one or more state specific regulatory questions.

The SITE Program has interacted with the ITRC at 2 levels. One levels is more programmatic based and the second level is more project specific or issue based. At the program level, the SITE program participated in the ITRC Verification Team. This team worked with 11 different verification programs including SITE in evaluating and documenting technical and cost parameters that are important to the different states. The report produced by the team documented technical information needs of the state regulatory agencies. The report includes a variety of elements to be included in verification program reports. The states participating in the ITRC were encouraged by the willingness of the programs like SITE to accommodate states' needs. This type of cooperation will enhance states' confidence in the verification results and allow them to make more informed decisions regarding innovative technology use.

At the more specific project level, SITE's environmental priority areas of interest currently crosscuts several ITRC workgroups. They are as follows: 1) Passive Barrier Workgroup, 2) DNAPL Workgroup, 3) Phytoremediation Workgroup. These groups are invited to participate in SITE Program demonstration projects. Groups choose to participate at a level required by the objectives of the workgroup. Involvement of the workgroups allows for better planning and exchange of technical requirements early in the project planning.

One example of multistate participation was the passive barrier technology demonstration at the DOE Rocky Flats facility. The ITRC workgroup was working on a regulatory guidance document for permeable barriers. Early in this document development the team was able to review documentation and test plan design from the SITE demonstration. This provided early feed back to DOE and SITE as well as provide valuable information to the ITRC team in developing the guidance document. The passive barrier workgroup attended a technical visitors day hosted by DOE and EPA. The group lead by DOE discussed construction, design and technology implementation. EPA led the discussion on the approach for testing and evaluating the demonstration. The ITRC team also participated in a field tour where they witnessed sampling procedures related to the performance demonstration.

In summary, the SITE programs approach to technology demonstration and verification promotes the use and implementation of innovative treatment technologies. By teaming early with multiple State and Federal Agencies in developing project plans and project implementing reduces cost and duplication of field demonstrations. In addition, it enhances the agencies confidence in the resulting demonstration data and allows for more informed decision making.