



Furthering the Use of Innovative Treatment Technologies in OSWER Programs

Introduction

The Office of Solid Waste and Emergency Response (OSWER) is seeking to further the use of innovative treatment technologies to permanently clean-up contaminated sites in the Superfund, RCRA, and Underground Storage Tank (UST) programs. According to a directive from OSWER's Assistant Administrator Don Clay, "...we must invest the necessary resources and take the risks now to develop the technologies necessary to fulfill the long-term needs of our hazardous waste clean-up programs." The directive, which was signed on June 10, 1991, includes a forwarding memorandum to EPA regions that calls for technological leadership and a sense of responsible urgency to prevent expenditures in pursuing less effective or more costly remedies. This fact sheet is based on OSWER Directive 9380.0-17.

Reasonable risk-taking is encouraged in selecting innovative treatment technologies that are capable of treating contaminated soils, sludges, and ground water more effectively, less expensively, and in a manner more acceptable to the public than existing conventional methods.

"Innovative treatment technologies" are newly-developed technologies that lack sufficient full-scale application data to ensure their routine consideration for site remediation. They may be new technologies, or may already be in use for various industrial applications other than hazardous waste remediation. As such, innovative technologies are not part of standard engineering practice or the competitive market process where available alternatives are routinely presented to the government and private sector. In functional terms, OSWER labels as "innovative" those treatment technologies other than incineration and solidification/stabilization for source control, and other than pumping with conventional treatment for ground water.

Inherent risks associated with early technology use serve as very serious impediments. The directive calls on potentially responsible parties, facility owners/operators, and consulting engineers to constructively work with uncertainty to further the application of technologies that are truly innovative. The directive also calls on EPA regional and headquarters managers to support Remedial

Project Managers and On-Scene Coordinators in their efforts to use new technologies.

Innovative treatment technologies should be routinely considered as an option in engineering studies where treatment is appropriate. They should not be eliminated from consideration solely because of uncertainties in their performance and cost. These technologies may be found to be cost-effective, despite the fact that their costs are greater than conventional options, after consideration of potential benefits including increased protection, superior performance, and greater community acceptance. In addition, future sites will benefit by information gained from the field experience.

The directive sets forth several initiatives and new procedures that will provide incentives for broader use of innovative technology. Some of these initiatives are directed toward potentially responsible parties and owner/operators, since these groups will be assuming a larger share of the remedial projects in the future. Other new initiatives are intended to remove impediments to the first-time use of new equipment. The directive also encourages wider application of available resources and tools and highlights some important on-going program efforts.

New Initiatives

1. Superfund Innovative Technology Start-Up Initiative

OERR will be revising its procedures for setting Remedial Action funding priorities to give more consideration to innovative technologies. Expedited funding of Fund-lead remedial design and construction projects that involve innovative treatment technologies will move the agency toward the Superfund program's goals for technology development and will provide data to support future Records of Decision (RODs).

This initiative also provides contract flexibility in the start-up phase of selected remedial and removal actions to assist vendors in establishing operations that satisfy performance standards. In an effort to remove some of the impediments to the use of new full-scale equipment, this



initiative will provide financial support for initial start-up and shake-down prior to beginning actual remediation. Funds are not targeted at making the technology "work at any cost", but in establishing performance adequacy of the technology prior to the onset of the contracted clean-up. Contracting strategies are being considered to compensate vendors regardless of whether or not they are able to meet performance requirements for a portion of the site remediation.

2. Dual Track RI/FS Initiative (Superfund)

EPA regions may fund additional treatability studies and engineering analyses for promising treatment technologies that would otherwise be considered unproven or too early in the development process. For PRP-lead sites early in the planning process, this initiative encourages the use of treatability studies to ensure that alternative remedies are thoroughly evaluated and considered in the ROD. Even if, in a particular case, there may be some doubt as to EPA's ability to recover the costs for these additional studies, they should nonetheless be pursued because of their value to the overall program.

3. Tandem ROD Evaluation Initiative (Superfund)

Primarily applicable to PRP-lead sites (though also to some Fund-lead sites), this program will enable regional staff to rapidly evaluate the efficacy of a PRP-proposed innovative remedy that is offered in tandem with the primary one approved in the ROD. Both remedies would be part of the proposed plan. The alternate solution would be approved in the ROD on a contingent basis but would undergo further development and pilot testing during the design period of the primary technology. Tandem RODs move the process of cleanup toward closure while leaving room for PRPs with an interest in innovative technologies to pursue additional pilot tests to demonstrate an alternate approach that is both innovative and potentially cost-effective. The OSWER/ORD Technical Support Centers and the SITE Demonstration Program will provide RPMs with technical support for evaluation of PRP work. When considering a tandem ROD, the region should consult with ORD concerning the scope of effort required for the evaluation.

If, after testing and evaluation, the innovative technology is chosen for implementation but the process has caused significant delays to the schedule, the region may consider the engineering problems of making the full-scale unit operational when assessing stipulated penalties. That is, in limited cases, stipulated penalties should not be imposed if the delays are the unavoidable result of the use of an innovative process.

4. Removal Program Initiative (Superfund)

It is OSWER policy to further the use of innovative technologies through the removal program. The relatively

small waste volumes and streamlined contracting procedures of the removal program provide an opportunity to complete clean-up projects and provide documentation on "lessons learned".

The potential of the removal program for these applications has not been realized because time constraints often favor excavation and off-site disposal or treatment and also because of the absence of clear legislated goals regarding the use of new technology. This directive is meant to clarify EPA's position on this issue and to encourage the use of innovative technologies for all actions, including time-critical actions, where feasible. These projects are expected to fulfill an important role in adding to our knowledge on promising new technologies.

5. RCRA Corrective Action and Closure Innovative Technology Initiative

This initiative encourages the regions to conduct treatability or technology demonstration studies at corrective action and closure sites to gain additional information on the use of innovative treatment for contaminated soil and debris.

EPA is developing best demonstrated available technology (BDAT) treatment standards for contaminated soil and debris at CERCLA and RCRA corrective action and closure sites. These sites present unique treatment problems that were not considered when developing the current BDAT standards which were based on data from the treatment of industrial process wastes. There is general agreement that wide scale use of incineration is not appropriate for soil and debris and there is a need to explore alternative approaches.

The current schedule is to promulgate a rule for the treatment of debris in May 1992 and for soil in April 1993. Prior to publication of these final rules, a site-specific treatability variance process (40 CFR 268.44 (h)) is available for contaminated soil and debris to establish an alternative standard for specified waste at individual sites. The variance process, along with applicable treatment guidance levels, is described in Superfund LDR Guide #6A (OSWER Directive 9347.3-06FS, July 1989), and is intended to be used as an interim approach until final standards are established.

The regions should work with owner/operators to select pilot-scale projects that can provide data on the capability of technologies and the treatability of different wastes. Projects should be carefully selected to maximize the utility of data and likelihood of success.

Authority for issuing site-specific variances for contaminated soil and debris has been delegated to the regions. The facility and EPA, in collaboration with the state, can implement variances for on-site demonstrations through two mechanisms: temporary authorization under the Permit Modification Rule, or 3008(h) orders for interim-status facilities.

6. Demonstration Projects at Federal Facilities (Superfund, RCRA, and UST)

EPA is exploring the use of Federal Facilities for both site-specific technology demonstrations and as test locations for evaluation of more widely applicable technologies. Regions are encouraged to suggest innovative approaches and to be receptive to proposals for innovation from Federal Facility managers, *e.g.*, by building timing and performance flexibility into compliance agreements in acknowledgment of the uncertainties associated with innovation. Federal Facilities often have characteristics that make them desirable for applying innovative approaches: large area, isolated locations, controlled access, numerous contamination problems, and increasingly active environmental restoration programs.

The Office of Federal Facilities Enforcement (OFFE) and the Technology Innovation Office (TIO) will work with the regions to identify locations for test and evaluation activities and to develop policies and guidance to ensure that support for innovation is congruent with other program and environmental objectives.

7. Federal Technology Transfer Act

During the clean-up planning and implementation process, PRPs or owner/operators should be reminded of the opportunity to engage EPA in evaluation studies or other arrangements (at their expense) to determine whether an innovative technology would be operative in the situation they are facing or other similar situations. Under the Federal Technology Transfer Act (FTTA) of 1986, cooperative agreements related to research, development, and technology transfer will allow the PRP to reimburse EPA for facilities, support services, and staff time spent in joint evaluation of early technology treatability or pilot studies.

Since this program is conducted in the research and development arena, it offers an opportunity for non-adversarial interaction outside the regulatory context. This opportunity should be especially advantageous to (1) PRPs and owner/operators capable of early planning for technology options at a few sites and desirous of early EPA input, as well as (2) PRPs and owner/operators that will be faced with a number of similar waste sites in the future—under Superfund, RCRA Corrective Action, and the UST program—who want to develop more uniform, cost-effective technology proposals for such sites.

Implementation

The first six initiatives involve field testing new technologies that may benefit from technical assistance from ORD. ORD represents an objective third party that can easily be accessed through the existing OSWER/ORD support structure. This structure consists of five labora-

tories that constitute the Technical Support Centers (both for Superfund and newly established for RCRA), the Superfund Technical Assistance Response Team (START) Program, the Bioremediation Field Initiative, and the Superfund Innovative Technology Evaluation (SITE) Program. OSWER has asked ORD to give priority to requests for technical assistance under this directive.

Broader Application of Existing Policies, Available Resources, and Tools

Furthering Innovative Remediation at Leaking UST Sites

State and local UST programs have identified 100,000 confirmed leaks, and this number may triple in the next several years. Most site remediation involves pumping and treating ground water and excavation and off-site treatment of contaminated soils. Regional offices should increase their efforts to make state and local managers and staff, as well as clean-up consultants and contractors, more familiar with non-traditional but proven technologies. Headquarters will continue fostering the development of new tools and techniques and should increase its support of regional efforts to achieve broader use of improved technologies.

Further Enabling State Innovative Technology Leadership

The CERCLA core funding program provides an opportunity to assist states in establishing innovative technology advocates. Cooperative agreements with state response programs may be a vehicle to support and promote the use of innovative technologies in state CERCLA programs, with spinoff benefits for their RCRA and UST programs as well.

In addition, regions should be open to assisting states interested in furthering technology development and encourage state applications for authority for RCRA R&D permitting, permit modification, treatability exclusion, and Subpart X permitting. States may also want to work directly with Federal Facilities in developing pilot sites for innovative technologies. For the reasons discussed in the section on Federal Facilities above, these sites are often good candidates for such development projects.

Model RI/FS Work Plan and PRP Notice Letter Demand for Innovative Options

Some regions have issued special notices containing a Statement of Work and administrative order language requiring the responsible party to evaluate the use of innovative technologies at a particular site. This procedure

should receive broader use at Superfund sites where alternatives for remediation are being considered for analysis in the RI/FS and where prerequisite treatability studies are required. This requirement in the special or general notice letters will help facilitate the development and use of innovative treatment technologies by the private sector. Specific language for this approach can be developed from OWPE's guidance document entitled "Model Statement of Work for RI/FSs Conducted by PRPs" (OSWER Directive 9835.8).

Advocacy and Funding of Treatability Studies

Superfund program policy requires that treatability studies be conducted to generate data to support the implementation of treatment technologies. Funds are budgeted annually in the SCAP based on expected need. Data and reports should be sent to Glen Shaul at RREL for inclusion in the ATTIC database. The correct protocol and format for these reports is in EPA's "Guide for Conducting Treatability Studies Under CERCLA" (EPA/540/2-89/058). Oversight funding for evaluating a PRP-lead treatability study should also be requested through the SCAP budget process. Oversight of PRP-lead treatability studies may be funded through the enforcement budget. If a PRP recommends use of an innovative treatment at a site, but current treatability study data on the technology are insufficient, EPA policy allows the Agency to conduct and fund technology-specific treatability studies. Cost of these studies are recoverable under Section 107 of CERCLA.

Tracking and Expediting SITE Demonstrations

OSWER is encouraging greater participation in the SITE program in response to a recent Inspector General audit of the program that focused on delays in matching Superfund sites with technologies. ORD management has also agreed that SITE demonstration projects must be more responsive to regional needs for treatability data.

The SITE program will make the design of technology evaluation sufficiently flexible to meet the regional offices' needs for treatability studies before remedy selection is made. Based on an ORD internal management review of the SITE program, changes are underway to make the program a more integral component of regional Superfund site activities.

Existing Program Efforts

OSWER has several other ongoing efforts directed toward furthering the application of innovative alternatives. These represent important resources that should continue to be used by the UST, RCRA, and Superfund Programs.

Technical Support and Information Management

EPA maintains several computer database that may be accessed for information on treatment technologies.

These databases include the Alternative Treatment Technology Information Center (ATTIC), the Cleanup Information (CLU-IN) Bulletin Board, the ROD Database, the Hazardous Waste Collection Database, and the Computerized On-Line Information System (COLIS). These systems include information on the application of innovative technologies and may be used to aid networking among OSCs and RPMs.

Technical assistance is available to Superfund and RCRA staff through ORD's Technical Support Centers and the Environmental Response Branch of OERR. Part of this effort involves networking among project managers through the Engineering and Ground Water Forums. In addition, as part of an initiative to provide direct technical support to OSCs and RPMs, the Superfund Technical Assistance Response Team (START) has been established to help evaluate the potential use of technologies.

Bioremediation Field Initiative

Begun in the fourth quarter of FY 1990, this program is intended to provide more real-time information on the field application of biotechnology for treating hazardous waste. The major focus of this initiative is to furnish direct support in evaluating full-scale cleanup operations and technical assistance for conducting treatability and pilot-scale studies.

Eliminating Contract Impediments

Under the Federal Acquisition Regulations, firms are restricted from performing both the design and construction of a project. EPA has determined that this applies only to the prime contractor responsible for the overall design, and not to the subcontractors performing treatability studies.

Innovative technology is considered a special exception from general conflict of interest guidelines. EPA will permit contractors and/or subcontractors who perform evaluation of innovative technologies for the Agency to later work for the PRPs in as many instances as possible.

Additional Information

Copies of the policy (OSWER Directive 9380.0-17) and additional copies of this fact sheet are available from:

National Technical Information Service (NTIS)
Springfield, VA 22161
Phone (703) 487-4650

Agency and State employees may obtain copies of the directive or this fact sheet from the Superfund Document Center, U. S. Environmental Protection Agency, Room 2514, 401 M Street S.W., Washington, DC 20460. The telephone number is FTS or 202/382-5628.