

**TECHNICAL REQUIREMENTS
FOR
ON-SITE LOW TEMPERATURE THERMAL TREATMENT
OF
NON-HAZARDOUS SOILS CONTAMINATED WITH PETROLEUM/ COAL TAR/ GAS PLANT WASTES**

- Final-

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Prepared by

The Interstate Technology and Regulatory Cooperation

Low Temperature Thermal Desorption Task Group

Overview

Low Temperature Thermal Desorption (LTTD) is a treatment technology which removes contaminants from solid media (e.g., soils) by volatilizing them with heat, but without combustion of the media. LTTD has been widely used in treating petroleum contaminated wastes and is being used increasingly in the cleanup of manufactured gas plant (MGP) wastes and hazardous constituents, notably chlorinated solvents and pesticides.

Goals of the LTTD Task Group were:

to produce a standard set of technical requirements which could serve as a model to allow the LTTD technology to move from state to state, without unnecessary redevelopment of technical requirements;

to improve market conditions for LTTD technology providers by providing a degree of consistency and predictability in technical requirements for implementation of the technology for cleanup;

to develop a viable, repeatable process for interstate cooperation directed toward enhancing implementation of innovative technologies and innovative application of existing technologies to site cleanup;

to provide a framework for states which have no specific regulatory requirements for LTTD should they choose to develop those requirements and to provide a gauge for states which do have requirements to assess those requirements in light of the common requirements of other states;

to provide a template of technical requirements which could be used as a model for other technologies for all functions presented above.

Approach

The LTTD Task Group began the technical requirements development process by addressing treatment of non-hazardous soils because they felt the effort would be relatively straightforward. The task group intends for the next version of the LTTD technical requirements document to address treatment of hazardous waste, specifically soils contaminated with chlorinated constituents. They plan to use firsthand experience gained from the Rocky Flats LTTD DOIT Demonstration, as well as expertise of knowledgeable vendors who are beginning to deploy LTTD in the field for the cleanup of hazardous

waste.

Although agreement was reached for all of the technical issues presented in this document, the group found that, even for the "simple" case, achieving consensus on technical requirements was a painstaking and time consuming effort. It should be recognized that a certain level of effort is inherent to the stakeholder involvement process and additional effort was expended as part of the learning process as the group members moved forward in their pursuit of interstate cooperation.

As in the case of the other TSTG's, the LTTD task group was open to any ITRC member. Participants with expertise and ongoing LTTD projects in their states elected to join this task group and contributed consistently to the development of this work product. Most of the practical experience of these state regulators was in the realm of treating petroleum and MGP soil contamination. In addition, two individuals from the United States Environmental Protection Agency (US EPA) and one individual representing the public participated as often as they could in group conference calls and draft product review. An industry consultant was retained to provide the industry perspective during one ITRC meeting.

Although all members of the ITRC were invited and actively encouraged to provide input into the LTTD work products, the group found that active participants were primarily those regulators who saw a specific need for the technology in their respective states. A few technology vendors who saw a viable market for their technology were willing to comment on draft documents. This natural tendency for participants to focus almost exclusively in their areas of interest should be taken into account when initiating future efforts for interstate cooperation.

Product and Process Evaluation

It is useful at this point to make a distinction between the initial work product and the process used to develop the product when evaluating the success and lessons learned from the LTTD effort. The initial work product is a document which blends diverse state technical requirements for a proven technology used for treatment of non-hazardous soils. The LTTD task group considered requirements from nine states to develop their draft document and circulated the document for review and comment to all member states of the ITRC.

This document as a deliverable provides benefits at several levels:

This document provides a baseline of technical requirements for implementation of LTTD for cleanup of petroleum and MGP contaminated soils. While the use of LTTD for petroleum contamination is becoming more routine, the use of LTTD for gas plant sites is less well established.

This document will serve as a template for the group's development of technical requirements for the more challenging case of soils contaminated with chlorinated solvents and pesticides.

This document can serve as a template for technical requirements for promising new technologies still in the demonstration and testing phase.

The entire document outline is generally transferable to other "relatively mature" technologies. The following sections of the document may be directly transferrable to other technologies:

- Approach to established baseline requirements, allowing for flexibility to address site specific and technology specific variables
- Analytical Methods
- Sample QA/QC
- Water Discharge Requirements
- Operations Record Keeping

- General QA/QC

- Health and Safety

Strong lessons were learned in terms of process development. Members of the LTTD task group developed the draft document during weekly facilitated conference calls and during breakout sessions at ITRC meetings. They produced successively modified versions of the document based upon feedback and input from the entire ITRC. Group members were exceptionally successful in circulating the draft LTTD document within their respective states and obtaining comments from various divisions of their organizations. A few additional states provided valuable and thoughtful comments.

The iterative process worked well for the LTTD group for their first revisions, because the individual group members were willing and able to invest the effort needed to follow-up with their colleagues.

The LTTD group realized greatest efficiency in having a core group of five to seven experienced people from different states produce the draft product.

A facilitator helped to keep their discussions focused and handled the actual document revision and production work.

Public stakeholder comment was solicited from stakeholder representatives of the ITRC. In concert with the full ITRC, the LTTD group adopted the recommended "A Guide to Tribal and Community Involvement in Innovative Technology Assessment". This guide clearly points out the desire and need for "meaningful community involvement" at the site implementation level.

The members of the group recognized the need for stakeholder involvement but had difficulty with determining the appropriate approach to stakeholder involvement. Their struggle centered around trying to incorporate site-specific stakeholder needs into their generic technical requirements document. The group feels this is a cross cutting issue and recommends that the full ITRC pursue a viable approach.

Additional stakeholder feedback was solicited by sending out the document for full ITRC review and comment, presenting the document at ITRC meetings and asking for feedback during facilitated breakout and full group sessions, and finally by asking for feedback directly from technology vendors. Overall, state representatives who did not respond to the LTTD group's original written request for comments also did not offer much feedback during ITRC meetings. Twelve vendors verbally committed to providing evaluation and feedback, but only a limited number actually provided comments.

In this case, a great deal of effort was expended to generate a marginal amount of feedback. An inherent limitation of the process is the lack of time for participants to provide thorough consideration to the other subgroups' work products, while trying to produce work products of their own. Thus, thoughtful consideration needed to understand all of the implications of these work products, in some cases, apparently has been deferred until individual state "sign off" for the documents is requested.

It is possible that the efficiency of the feedback/revision loop could be improved by taking more time up front to identify stakeholders who are likely to provide the needed feedback and concentrate efforts there. However, the group must still genuinely attempt to give all stakeholders an opportunity to voice their concerns.

Communication between the LTTD Task Group and the Full ITRC

The chair of the LTTD Task Group, as well as the chairs of the other TSTG's, also served as members of the ITRC Steering Committee. As a result, ITRC overarching requirements and expectations were clearly communicated to the LTTD Task Group. The group was allowed and encouraged to develop the LTTD work product autonomously, while keeping the ITRC mission in mind. Requests from the LTTD group for ITRC support were fully accommodated in the form of facilitation, full group sessions and breakout sessions on LTTD. **The cross-linked structure between the LTTD Task Group and the ITRC enhanced the flow of information and fostered communication in both directions.**

ITRC Acceptance of the LTTD Work Product

The LTTD group members began and will continue to follow steps of the November 1, 1995 "ITRC Decision Making Process" as they seek to gain acceptance by the ITRC members of their work product. States have been asked to indicate their level of acceptance and commitment to implementation (full acceptance, acceptance of indicated sections of the document, acceptance with reservations or noted exceptions, non-acceptance). ITRC members are working within their respective state agencies to obtain letters describing level of acceptance at the appropriate level within their organizations.

Even though existing laws/regulations may make it impossible for some states to accept and implement provisions of the LTTD document in its entirety, the process is providing value in that:

Acceptance to the extent possible is being documented, bringing a level of consistency and predictability to implementation LTTD in the field

Specific impediments to acceptance and implementation are being identified for future resolution

The initial effort to ascertain ITRC states level of acceptance occurred during the March through May 1996 time frame. A summary of state concurrence efforts to date, along with copies of concurrence letters received to date, are provided in Appendix B. Table B-1 shows that ten states already have submitted letters to indicate their level of acceptance and commitment to use of this document.

The LTTD subgroup plans to continue to work with the remaining ITRC states to document their level of acceptance of this work product. In order to maximize response, the members of the LTTD TSTG recommend that the governors of the ITRC states ask their environmental health agencies to designate an appropriate individual to carefully and thoughtfully consider the work product produced by this group and to report back to their respective governors on the level of acceptance and implementation they can recommend.

Outstanding Issues

Initial efforts of the LTTD group involved taking a diverse set of existing requirements from several states, attempting to resolve differences and identifying those areas which could not be reconciled. In several instances, the group found that existing federal or state statutes/regulations conflict with one another. As a result, the full ITRC was not able to reach consensus on certain issues. The interim solution was either to pass the overarching issues on the full ITRC or to relegate these issues to a state by state (or case by case) resolution. As yet, several technology specific and overarching issues remain unresolved. Major concerns include:

How to effectively involve the public in this process

Whether an LTTD unit and/or its afterburner is classified as an incinerator

The number and nature (discrete vs. composite) of verification samples to be collected

Whether field analytical methods can be used in place of offsite laboratory sample analysis

How to deal with time delays and costs associated with permitting requirements for Resource Conservation and Recovery Act (RCRA) hazardous waste sites