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VISITT
Vendor Information System for Innovative Treatment Technologies

User Manual
(VISITT Version 3.0)

Any questions, call VISITT Hotline:
1-800-245-4505 or 703-883-8448

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NOTE TO USER

The third release of the Vendor Information System for Innovative Treatment Technologies (VISITT) database (Version 3.0) contains information collected from vendors by the U.S. Environmental Protection Agency (EPA) through fall and winter 1993-94. VISITT database updates will be released annually so that VISITT will remain a dynamic tool in linking remediation professionals with the evolving innovative technology field. EPA strongly encourages you to register as a VISITT user. As a registered user, you will receive announcements of new software and data releases and other relevant innovative technology information from EPA's Technology Innovation Office.

To register as a VISITT user, please send the following information by facsimile to (513) 891-6685:

- Name
- Organization
- Address
- Telephone number
- Diskette size (3-1/2″ or 5-1/4″)
- Indication that this request is to order the VISITT software or to register as a VISITT user only

Or mail the information to:

U.S. EPA/NCEPI
P.O. Box 42419
Cincinnati, OH 45242-0419

DISCLAIMER

Inclusion in the U.S. Environmental Protection Agency's Vendor Information System for Innovative Treatment Technologies (VISITT) does not mean that the EPA approves, recommends, licenses, certifies, or authorizes the use of any of the technologies. Nor does the EPA certify the accuracy of the data. Listing in this database means only that the vendor has provided information on a technology that EPA considers to be eligible.

Errata Sheet

The following information should be substituted for information in the VISITT 3.0 User Manual to make it compatible with VISITT 4.0.

Existing Text in VISITT 3.0	Replacement Text in VISITT 4.0
Page 5, Section 2.1: You should have at least 10 megabytes of free disk space, and the file handles statement (FILES=*n*) for at least 45 (n=45) should be included in your Config.sys file.	You should have at least 10 megabytes of free disk space, and the file handles statement (FILES=*n*) for at least **60** (n=**60**) should be included in your Config.sys file.
Page 5, Section 2.2: **Step 5:** If you are using three 3-1/2" installation disks, you will be prompted to insert the disks accordingly.	**Step 6:** If you are using **two** 3-1/2" installation disks, you will be prompted to insert the disks accordingly.
Page 7, Table 1: "Sorry; VISITT requires at least 470K of free memory to start."	"Sorry; VISITT requires at least **490K** of free memory to start."
Page 7, Section 2.4: To ensure proper operation of the system, VISITT 3.0 checks your system for a minimum of 45 file handles in your Config.sys file and will change the Config.sys file automatically if the file handles statement is less than 45.	To ensure proper operation of the system, VISITT **4.0** checks your system for a minimum of **60** file handles in your Config.sys file and will change the Config.sys file automatically if the file handles statement is less than **60.**
Page 9, Section 2.4: **Step 3(c):** Find the line that reads FILES=*n*. If $n \leq 45$, you must edit your config.sys. If $n \geq 45$, the number of the file handles is sufficient, and you can quit this routine.	**Step 3(c):** Find the line that reads FILES=*n*. If $n \leq 60$, you must edit your config.sys. If $n \geq 60$, the number of the file handles is sufficient, and you can quit this routine.
Page 9, Section 2.4: **Step 3(g):** At the next asterisk, type **FILES=45**, and press **<Enter>**.	**Step 3(g):** At the next asterisk, type **FILES=60**, and press **<Enter>**.

VISITT 4.0 offers the option of viewing a process flow diagram for each technology, provided that the vendor has supplied one. A VGA monitor is necessary to view the diagrams.

VISITT USER COMMENTS

The U.S. Environmental Protection Agency welcomes comments from VISITT users. Your comments will allow us to improve future system updates. Please use this form to offer any comments you may have concerning VISITT, including its usefulness, contents, useability, or hardware requirements. If you are available to discuss your comments with the VISITT System Operator, please include your name and telephone number.

Please mail or fax your comments to:

VISITT System Operator
1505 PRC Drive
Suite 220
Mclean, VA 22105
Fax: (703) 556-2852

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1.0 INTRODUCTION

The Technology Innovation Office (TIO) of the U.S. Environmental Protection Agency (EPA) Office of Solid Waste and Emergency Response (OSWER) has developed the Vendor Information System for Innovative Treatment Technologies (VISITT) to provide current information on innovative treatment technologies for the remediation of contaminated sites. VISITT contains technology information submitted by developers, manufacturers, and suppliers of innovative treatment technology equipment and services. This database provides a means for innovative technology vendors to make their products and capabilities known to state, Federal, and private sector professionals like you. You can use VISITT to screen technologies that may be appropriate for cleanup of the nation's hazardous waste sites or to gain additional information about those technologies.

EPA believes that VISITT offers an unprecedented opportunity for users like you to screen innovative technologies for engineering feasibility and to identify those vendors that provide treatability studies and cleanup services. Innovative technologies are undergoing rapid change and improvement, making it difficult to maintain current information on their developmental status and commercial availability. VISITT will play an important role in the further expansion of this market by improving the access of remediation professionals to innovative technologies and their vendors.

VISITT Version 1.0, the first release of the system, contained 155 technologies offered by 97 vendors. Since its release in June 1992, VISITT has been distributed, on request, to more than 10,000 users in 62 countries. Version 2.0 contained 231 technologies offered by 141 vendors. This VISITT update, Version 3.0, contains 277 technologies provided by more than 170 vendors. In addition to the increase in technologies and vendors, Version 3.0 also contains updated information on most of the Version 2.0 vendors, expanded search capabilities, and project-specific cost and performance data.

1.1 VISITT Contents

VISITT contains information on innovative treatment technologies for the remediation of contaminated sites. For this database, innovative technologies are defined as those for which a lack of performance and cost data precludes their routine use to clean up sites. Examples of innovative technologies include thermal desorption and soil vapor extraction. Technologies in VISITT address the treatment of soil, sludge, solids, and natural sediments, both above ground and in place (in situ), dense non-aqueous phase liquids (DNAPL); and light non-aqueous phase liquids (LNAPL). Also included are methods of treating ground water in situ and of treating the off-gas generated by innovative treatment systems. Incineration, solidification-stabilization, and methods of treating aqueous waste above ground are not considered innovative and are not included in VISITT. Containment technologies, technologies that treat routinely generated industrial wastes, and technologies that measure or monitor wastes also are not included.

The information contained in VISITT is drawn from EPA's Vendor Information Form 3.0 (EPA Form 542-R-93-002) as that information was assembled and submitted by the innovative treatment technology vendor. This form has been reproduced in VISITT 3.0 as the Vendor Information Record. EPA's authority to collect this information is found in Section 311 of the Superfund Amendments and Reauthorization Act of 1986 (SARA) (42 USC 9601 *et. seq.*). EPA also received approval to collect this information from the Office of Management and Budget (OMB) under the Paperwork Reduction Act

(OMB #2050-0114). Each record contains the engineering specifications and performance data that vendors disclose about their technologies. The information is grouped into two major sections: (1) General Vendor Information and (2) Other Information Options.

1.1.1 General Vendor Information

The **General Vendor Information** section supplies the vendor's name and address, the technology type and trade name, the status of the technology's application (bench, pilot, or full scale), indication whether a vendor is participating in EPA's Superfund Innovative Technology Evaluation (SITE) Program (see Appendix A for more information on EPA's SITE program), trademark and patent information, a contact name and phone number, the vendor's Standard Industrial Classification (SIC) code, and whether or not a vendor is classified as a "small" business.

1.1.2 Other Information Options

The **Other Information Options** section provides descriptions of the technology and available performance information:

- Description
- Highlights
- Limitations
- Other Comments
- Waste Applications
- Representative Projects
- Estimated Price Range
- Technical References
- Bench-Scale Information
- Pilot-Scale Information
- Full-Scale Information

1.2 VISITT Capabilities

VISITT allows you to:

- Obtain summary information on innovative technologies that treat the wastes you select or that have been employed at specific sites
- Identify vendors by treatment technology type and by trade name, site name, and location
- Learn about technologies employed at cleanup sites, or about vendors that have conducted treatability studies on specific wastes, or about cleanups at particular sites
- Learn about project specific cost and performance data
- Choose a visual display of successive record screens on your monitor
- Scroll through a vendor's information record page by page, using menu selections
- Print entire records to a standard or laser printer or direct entire records to a DOS file
- Print selectively the portion of a single record in which you are interested

- Print selectively the portion of the records in which you are interested from all the vendor records identified in your query

The print commands help you create a more permanent document for your use after you have searched VISITT for the exact information you want to consider. VISITT has been designed to save you time and effort by selecting only the information that you want to consider -- you need not sift through countless printed records containing vendor and technology information; the search capabilities of the VISITT system will do the sifting for you and provide you with a specific and condensed summary of available information on innovative treatment technologies. By enabling you to print information from all the records you identified in your query, VISITT facilitates comparison among technologies.

Because VISITT is menu-driven, you will not need training to begin using the program. However, this user manual serves as a reference for such routine procedures as data querying, site and technology matching, and report printing. Instructions also are provided in the manual for software installation and software maintenance. **HELP** windows are provided throughout the system.

1.3 Contents of This Manual

Chapter 1 discusses background information on VISITT and outlines the VISITT user manual. Chapter 2 shows you how to install VISITT on your PC or network and how to use the standard VISITT features and commands. It also gives you some tips for troubleshooting errors that may occur during installation and use of VISITT. Chapter 3 shows you how to select criteria for searches, perform searches, and print the information that VISITT retrieves for you. Chapter 4 explains VISITT's search categories. Chapters 5, 6, and 7 discuss the system reports, the system introduction option, and the on-line registration form. Chapter 8 gives a detailed description of the contents of the Vendor Information Form 3.0, as it is reproduced in VISITT.

The appendices included with this manual will help you understand the information included in VISITT. Appendix A is a fact sheet on EPA's SITE program. Appendix B provides descriptions of the submenu items featured under each main menu search category. Appendix C provides categories for and definitions of technologies featured in VISITT. Appendix D contains the contaminant group codes for hazardous substances. Appendix E provides a facsimile of a printed vendor information record. Appendix F is a brochure on the Alternative Treatment Technology Information Center (ATTIC) system, and Appendix G is a brochure on the Clean-Up Information Bulletin Board (CLU-IN) system.

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2.0 INSTALLATION

VISITT Version 3.0 should be installed as a new database, replacing Version 2.0 altogether. You may choose to leave VISITT Version 2.0 on your hard drive; however, it is recommended that you remove Version 2.0 to free disk space. Create a backup copy of the installation software disks. Store the original disks in a safe place, and use the backup disks for installation. (NOTE: VISITT also may be installed on a local area network (LAN) as a multiuser system.)

2.1 System Requirements

The VISITT system software requires an IBM-compatible computer running MS-DOS 3.3 or higher and least 640K of RAM. You should have at least 10 megabytes of free disk space, and the file handles statement (FILES=*n*) for at least 45 (n=45) should be included in your Config.sys file. Note that the VISITT installation program automatically changes the Config.sys configuration if the file handles statement is less than 45. For optimum performance, your environment space should be greater than 1024K.

2.2 System Installation

The installation program creates a directory on your computer's hard drive and copies the program files into that directory. To start the installation program:

Step 1: Insert the diskette labeled INSTALLATION DISK #1 into the appropriate source drive of the computer and, at the DOS prompt, type the **drive letter** designating your source drive and press **<Enter>** (for example, **A:<Enter>**).

Step 2: At the **letter prompt** for the designated drive, type **INSTALL** and then press **<Enter>**.

Step 3: The system will prompt you to specify the drive where you want to install VISITT (refer to Figure 2.1). The system defaults to drive C:. If you wish to install VISITT to your C drive, simply press **<Enter>**. Otherwise, type the letter of the designated drive followed by a colon (for example, **D:**) and press **<Enter>**.

Step 4: The system also allows you to specify the directory where you want to install VISITT (refer to Figure 2.2). The system defaults to the **\VISITT** directory. If you wish to install VISITT in this directory, press **<Enter>**. Otherwise, type the name of the desired directory and press **<Enter>**. VISITT will now begin installing to your specified hard drive and directory.

Step 5: If you are using three 3-1/2" installation disks, you will be prompted to insert the disks accordingly. Having done so, press any key to continue. If you are using five 5-1/4" installation disks, you will be prompted to insert the disks accordingly.

Step 6: You must now reboot your system, either by turning your computer off and on, or by simultaneously pressing the **<Ctrl>**, **<Alt>**, and **<Del>** keys.

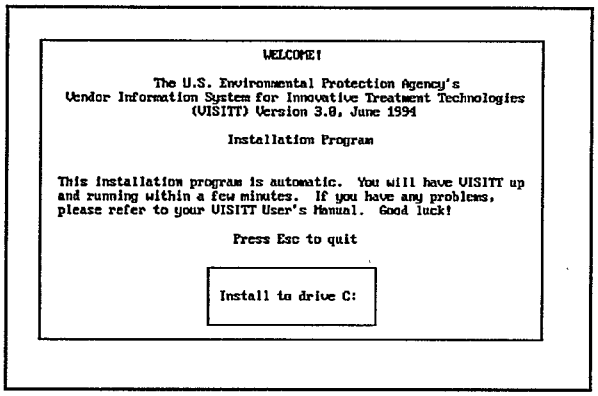

Figure 2.1: Installation Screen 1

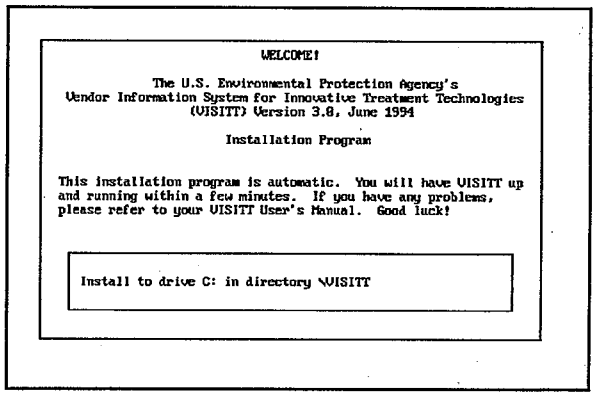

Figure 2.2: Installation Screen 2

Example of an Installation

If you are installing from the A: drive and want your VISITT application in your hard disk C: drive, your source drive will be **A:** and your target drive will be **C:**. You would then type the following:

A: Press **<Enter>**

INSTALL

The installation program will guide you through the remainder of the installation process.

After VISITT has been installed, follow the procedure described below when you wish to run VISITT:

Step 1: Type the drive letter designating the drive where VISITT is installed, followed by a colon (for example, **C:**) and press **<Enter>**.

Step 2: At the prompt, type **VISITT** to run the program (for example, **C:VISITT**) and press **<Enter>**.

2.3 Common Installation Errors and Their Solutions

Some errors may occur during the installation of VISITT; the errors will be displayed on the screen. Table 1 below provides a summary of the errors most likely to occur during installation procedures and some suggested solutions.

Table 1: Troubleshooting Installation Errors

Message	Reason	Solution
"Sorry; VISITT requires at least 470K of free memory to start."	There is not enough RAM in the PC or you may be running another software package, such as Windows, WordPerfect, DOS shells, Norton shells, PC Tools, or menu utilities, at the time of installation.	At the DOS prompt type **MEM** and press **<Enter>**. If the largest executable program size is less than 470K, shut off other software. Reboot your PC, and repeat the installation procedure for VISITT.
"Incompatible DOS version"	VISITT requires MS-DOS 3.3 or higher to run.	Update your DOS version.
"Not enough disk space"	VISITT requires at least 10 megabytes of free disk space before installation.	Free some disk space by removing files from your hard drive.
"Conducting necessary setup...please wait."	User has DOS 6.0 or higher. The Config.sys file must be amended to delete "No EMS Highscan."	Deactivate the "No EMS Highscan" line in the Config.sys file by typing **REM** at the beginning of that line.
"Code 2 Corruption detected (LAN): Network request not supported."	Files have been corrupted by the installation process, operation of other software packages, or corrupted diskettes.	Delete all .NTX files in the VISITT directory, or turn off other software programs, such as Windows, DOS shells, or WordPerfect, or order new diskettes.

2.4 Troubleshooting System Errors

Errors may occur during normal operation of VISITT. To ensure proper operation of the system, VISITT 3.0 checks your system for a minimum of 45 file handles in your Config.sys file and will change the Config.sys file automatically if the file handles statement is less than 45. VISITT 3.0 also checks the system for sufficient disk space. Table 2 below shows several possible errors that may occur, provides the reasons why some errors may arise, and offers suggestions on the best approach to rectifying the problems.

Table 2: Troubleshooting System and Operation Errors

Operating Problem	Reason	Suggested Solution
Program won't run after installation.	There is not enough RAM in the PC.	Turn off other software programs, such as Windows, WordPerfect, DOS shells, Norton shells, PC Tools, or menu utilities, while using VISITT. Reboot your PC and try to enter VISITT from the DOS prompt. If the problem persists, check your PC to make sure that it has at least 640K of RAM.
After typing **VISITT** to run the program, an error message appears that reads, "System Error. Consult Your Computer Support Personnel."	An internal error in the VISITT program has occurred.	Determine the nature of the error from the explanation provided in the VISITT directory's Error.txt file. Either follow the instructions listed below, or show the explanation of the error to your computer support personnel.
The technology displayed on the **General Vendor Information** screen retrieved from the database is different from the technology you selected during the "Select Search Criteria" operation.	VISITT database files are corrupted.	At the VISITT directory (e.g., C:\VISITT), type **DEL *.NTX**, press **<Enter>**, and re-execute the program.
Your are running out of disk space when printing.	VISITT requires a minimum of 1 megabyte of free disk space to run the reports (larger reports will require more disk space).	Free some disk space by deleting unnecessary files.
The error message tells you that there is an inconsistency in the database.	System data files need to be reindexed.	Press **<ESC>**. At the prompt, type **DEL *.NTX**, and re-execute the system.
The error message tells you that you have a VM Integrity Failure.	The function that you are trying to conduct is too complex for either your PC or for the system.	Re-execute the system and limit the complexity of your operations. This can be accomplish by limiting the number of times you scroll through the representative project information.

You can determine the exact type of error that has occurred by following these steps to gain access to the ERROR.TXT files:

Step 1: At the DOS prompt, type **TYPE ERROR.TXT** and press **<Enter>**.

Step 2: The latest system error will be described in one or more lines of text.

Step 3: VISITT's installation program automatically checks and changes your Config.sys file; however, if the statement "file handles" has been changed since installation, and if the initial system error tells you to "Check your Config.sys file," you might be able to solve the problem by performing the following procedures, if you are running under DOS version 4.0 or lower:

Step 3(a): At the DOS prompt, type **CD** and press **<Enter>**.

Step 3(b): At the DOS prompt, type **TYPE CONFIG.SYS** and press **<Enter>**.

Step 3(c): Find the line that reads FILES=*n*. If $n < 45$, you must edit your config.sys. If $n \geq 45$, the number of the file handles is sufficient, and you can quit this routine.

Step 3(d): To edit the config.sys file, type **EDLIN C:\CONFIG.SYS** at the DOS prompt (refer to Figure 2.3).

Step 3(e): At the asterisk (*), type the letter **L** and press **<Enter>**.

Step 3(f): At the next asterisk, type the number (for example, 1, 2, 3, . . .) corresponding to the line FILES=*n* and press **<Enter>**.

Step 3(g): At the next asterisk, type **FILES=45**, and press **<Enter>**.

```
C>EDLIN C:\CONFIG.SYS
End of input file
*L
        1:*files=20
        2: buffers=20
*1
        1:*files=20
        1:*files=45
*L
        1:*files=45
        2: buffers=20
*E

C>
```

Figure 2.3: Editing Config.sys

Step 3(h): At the next asterisk, type the letter **E** and press **<Enter>**.

Step 3(i): You must reboot your computer, either by turning your computer off and on or by simultaneously pressing **<Ctrl> <Alt> <Del>**. Now try to run the system.

Step 4: If you are operating your system under DOS version 5.0 or higher, you might be able to solve the problem by following the following steps:

Step 4(a): At the DOS prompt, type **EDIT**.

Step 4(b): Press **<Enter>**.

Step 4(c): Simultaneously press **<Alt> <F>** to access the File option.

Step 4(d): Press **<O>** to open a file.

Step 4(e): Type **CONFIG.SYS**.

Step 4(f): Using the ↑ ↓ keys, move the cursor to the line containing FILES = *n*.

Step 4(g): If *n* is less than 45, change the *n* to 45.

Step 4(h): Simultaneously press **<Alt> <F>**, followed by **<S>** to save the changes.

Step 4(i): Type **<X>** to exit the DOS edit function and re-execute VISITT.

Step 5: If the previous steps do not work, describe the error to your computer support personnel.

2.5 VISITT Standard Features

VISITT contains standard selection screens and uses standard features so you can learn the program quickly and use it efficiently. Table 3 below describes each standard feature and explains how to operate the feature.

Table 3: Standard Keyboard Commands

Command		Command Operation
<Esc>	**Returning to Previous Screen**	Use the **Escape** key (abbreviated in this manual and on your computer keyboard as **<Esc>**) to leave VISITT operations and selections. For example, if you are in a VISITT look-up table or in a search category of the main menu, the **<Esc>** key will return you to the previous screen or the main menu, depending on where you were when you pressed **<Esc>**.
<Enter>	**Selecting an Item**	Use the **<Enter>** key to tell VISITT to accept any entries or perform a highlighted option you want to select, or to move your position within the program from a specific search category to its submenu. **<Enter>** always is used to make a selection within a look-up table: when selecting an item from a look-up table, **<Enter>** will select or deselect a highlighted item.
↑ ↓	**Highlighting with Arrow Keys**	↑ ↓ keys are used throughout the VISITT program to move from one main menu search category to another or to scroll through a submenu or look-up table. ↑ ↓ keys will move your cursor horizontally across a selection of menu items or vertically through a submenu or table. You can type the first character of the name of any menu item to make a selection as an alternative to highlighting the menu item and pressing **<Enter>**.

Table 3: Standard Keyboard Commands (continued)

Command		Command Operation
<F1>	**Help**	Use the **<F1>** key for **Help**. When you are in any of VISITT's search categories, submenus, or tables, pressing **<F1>** will generate a **Help Window** on your screen with directions for the specific place in the VISITT system at which you asked for help. You can exit any help window by pressing **<Esc>**.
<F2>	**Memo Fields**	Memo fields are used at several points in the VISITT system to allow you access to additional information specific to a data field on a Vendor Information Record. The memo fields contain descriptions of a treatment technology's performance or specifications. Use the **<F2>** key to access memo fields relevant to the general information record, pilot- and full-scale records, and estimated price range record. Whenever the **<F2>** option is available for use in a specific screen, the feature will be noted in a message at the bottom of the screen, as will several other standard feature options applicable to that screen or operation.
<F3>	**Print**	Use the **<F3>** key to access the print features in the system. Whenever the **<F3>** option is available for use in a specific screen or record, the feature's availability will be noted at the bottom of the screen, as will several other options that are applicable to that screen or record. Use the ↑ ↓ keys to move from option to option within the print screen.

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3.0 STANDARD OPERATIONS

There are four distinct operations in the VISITT system: "Select Search Criteria," "Perform Search," "Clear Search Criteria," and "Print." Each of the four operations always will perform in the same manner, regardless of the search category in which you want to perform an operation. VISITT is structured so that any search category can be narrowed to a more specific topic through its "Select Search Criteria" submenu and through each search criterion's look-up table items.

3.1 Searching for Records

"Select Search Criteria" allows you to specify and select parameters of a search relative to a search category. This operation allows you to select specific technologies, locations, vendors, wastes, or contaminants to limit the search to only the information that is useful to you.

Each search category -- **Waste/Technology/Vendor** and **Site** -- has its own unique set of parameters that are displayed in a submenu of the search category (see Chapter 4.0 for more information about search categories and their submenus). From the submenu, you may select one or several limits on the search operation. You can use the parameters either to expand or to restrict the scope of your search.

3.1.1 Building Query

Figure 3.1 illustrates the "Select Search Criteria" screen and its major features: (1) the search category, (2) the search criteria submenu, and (3) the search criterion look-up table. These components establish the parameters of the query you use to search for records.

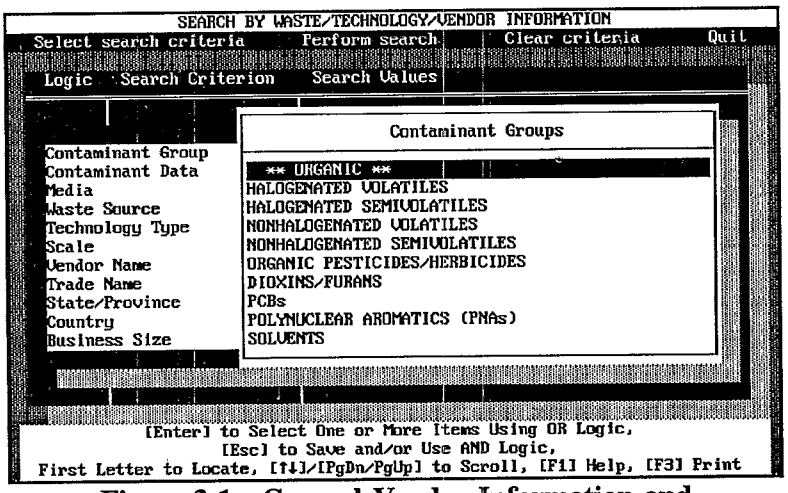

Figure 3.1: General Vendor Information and Look-Up Table

The search category shown in Figure 3.1 -- **Waste/Technology/Vendor** -- has a search criteria submenu. Each search criterion that you select from the submenu to help you focus your information search has a search criterion look-up table unique to that search criterion. From the look-up table, you will select items referred to in VISITT as search values.

In Figure 3.1, the search category **Waste/Technology/Vendor** has a search criteria submenu composed of eleven criteria: **Contaminant Group**, **Contaminant Data**, **Media**, **Waste Source**, **Technology Type**, **Scale**, **Vendor Name**, **Trade Name**, **State/Province**, **Country**, and **Business Size**. The search criterion

Contaminant Group has been selected to start building a search, and the search criterion look-up table **Contaminant Groups** appears to the right of the submenu. The look-up table contains search values relevant to the search criterion.

3.1.2 Selecting Key Terms for the Query

To obtain the innovative treatment technology information in VISITT through a search of the database, you first must choose a number of search values that will help VISITT obtain the specific types of information you want to examine. This process is known as building a query.

You can build a query by following these steps:

Step 1: Choose a Search Category
Choose a search category from the main menu by moving the highlight with the ↑ ↓ keys and pressing **<Enter>**, or just press the first letter of the desired option. The "Search by ..." screen will appear.

Step 2: Select Search Criteria
The "Search by ..." screen features a menu of three operations. "Select Search Criteria" will automatically be highlighted. Press **<Enter>**. The search criteria submenu will appear.

Step 3: Choose a Search Criterion
Select a search criterion from the submenu by moving the highlight with the ↑ ↓ keys to a criterion. Press **<Enter>**.

Step 4: Choose Potentially Could Be Treated or Actually Treated Option
When choosing a search value from the **Contaminant Group**, **Media**, or **Waste Source** search criteria, you must select "ACTUALLY Treated Only," or "POTENTIALLY Could Be Treated or ACTUALLY Treated" to specify whether you want to build a query based on values that vendors actually have treated at a site or in a laboratory or values that actually have been treated or potentially could be treated (values not necessarily proven to have been treated). Highlight the desired specification with the ↑ ↓ keys and press **<Enter>**. The selected search criterion look-up table will appear to the right of the search criteria submenu. For more information on this option, refer to Section 3.1.3 below.

Step 5: Choose Search Values
Select a search value from the look-up table by moving the highlight with the ↑ ↓ keys to the position that features the value you want to include in your search or just press the first letter of the desired value. Press **<Enter>** to select that value. When the search value has been selected, a small check mark will appear in the right-hand margin of the look-up table. Press **<Esc>** to exit the look-up table.

Additional search values:

Step 6: Choose Additional Search Values and Selection Logic
Select as many search values as you wish from a look-up table. If you make multiple selections from a look-up table, VISITT will automatically set the selection logic to "OR."

This "OR" logic broadens your search to cover as many instances as exist in the database in which one or more of the search values match a technology record.

If you wish to create a query that searches for a technology that addresses a unique combination of search criteria from the same look-up table or several different look-up tables, you must use the "AND" logic. "AND" logic will narrow or focus your search considerably. However, logic that is too selective (too many search values linked by "AND") may fail to identify any technologies that meet your criteria.

To select "AND" logic, you must exit the look-up table from which you have made your first search value selection by pressing **<Esc>**. You may choose either (a) to reenter the submenu look-up table by pressing **<Enter>** once again or (b) to enter a different submenu look-up table. In either case, VISITT will produce the And/Or Logic Window and prompt you to choose the logic you want to use in your search. Highlight "AND" and press **<Enter>** to select "AND" logic (for an illustration of logic selection and an example of the logic process, see Section 3.1.4 below).

Step 7: Remove Search Values

If you decide that you do not want to include a search value that you have just selected, move the highlight with the ↑ ↓ keys to that value or just the first letter of the selected value. Press **<Enter>** once again. You thus will deselect the search value, and the check mark will be removed from the right-hand margin of the look-up table. This operation will remove the search value from the set of search parameters you are creating.

Step 8: Load Selected Criteria

You may now load these selected criteria into the "Select Search Criteria" screen by pressing **<Esc>**. This operation will allow you to "back out" of the look-up table and return to the submenu, where you can select more criteria and their search values to complement your data search. If you are satisfied with the search parameters that you have chosen, press **<Esc>** to "back out" of the submenu to the "Select Search Criteria" operation screen.

Step 9: Lock Selected Criteria

If you are satisfied with the search parameters shown on the "Select Search Criteria" operation screen, move the highlight with the ↑ ↓ keys to "Perform Search" on the horizontal menu and press **<Enter>** or press the letter **P**. To begin the search of the database, please refer to Section 3.2.

Step 10: Clear Selected Criteria

If you are dissatisfied with the search parameters shown on the "Select Search Criteria" operation screen, move the highlight with the ↑ ↓ keys to "Clear Criteria" on the horizontal menu and press **<Enter>** or press the letter **C**. Begin again at Step 1 to reconstruct your search.

3.1.3 Focusing a Query by Specifying Potentially Could Be Treated or Actually Treated Criteria

When choosing a search value from the **Contaminant Group**, **Media**, or **Waste Source** search criteria, you may limit your search to include only those technologies for which vendors have specified that they *actually* have treated your selected **Contaminant Group**, **Media**, or **Waste Source**. You can expand

your search to also include those technologies for which vendors have specified that they *actually* have treated or *potentially* could treat your selected **Contaminant Group**, **Media**, or **Waste Source**.

When choosing a search value from the **Contaminant Group**, **Media**, or **Waste Source** search criteria, you must select "ACTUALLY Treated Only" or "POTENTIALLY Could Be Treated or ACTUALLY Treated" (refer to Figure 3.2) to specify whether you want to build a query based on values that vendors *actually* have treated at a site or in a laboratory or one based on values that *actually* have been treated or *potentially* could be treated (values not necessarily proven to have been treated). Highlight the desired specification with the ↑↓ keys and press **<Enter>**. The selected search criterion look-up table will appear to the right of the search criteria submenu.

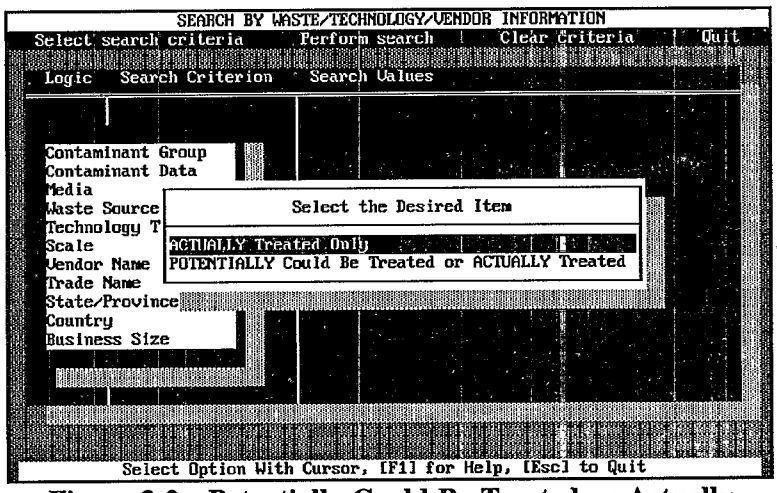

Figure 3.2: Potentially Could Be Treated or Actually Treated Option Window

3.1.4 Focusing a Query With And/Or Logic

Choosing the type of logic employed in your search allows you to focus or expand the search criteria, so that you can obtain the exact type of vendor and technology records you want. This logic value allows you to search for a technology that treats **Soil** and **Sludge** media, for example, or to search for a technology that treats **Halogenated Volatiles** or **Polychlorinated Biphenyls (PCB)**.

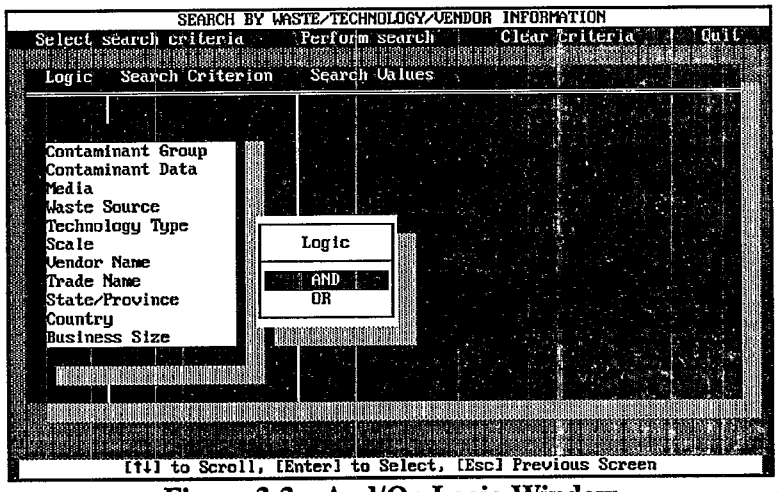

Figure 3.3: And/Or Logic Window

Whenever you begin building your query by selecting search values from more than one type of search criterion, VISITT will prompt you to decide which type of logic you want to employ by prompting you to make a selection from the And/Or Logic Window (refer to Figure 3.3). "AND" allows you to narrow the search to a unique set of search values that you specify. "OR" allows you to broaden your search to cover as many instances as exist in the database in which one or more of the search values match a technology record.

Example of And/Or Logic in a Search or Query

You decide to search for a technology that treats any one of a set of specific wastes. The **Or** logic will be engaged automatically as you select contaminants from the look-up table. If you want to find a technology that treats any one of those specific wastes while they are situated in a certain medium -- in ground water, for example -- you will select the **Media** search criterion from the submenu.

As you do so, VISITT will prompt you for And/Or logic. If you select **Or** logic, VISITT will obtain records that match only your contaminant search values and only your media search values -- but the technologies retrieved from the database may not address both sets of search values in combination.

Selecting **And** logic, on the other hand, allows you to retrieve those technologies that address both sets of search values in combination, that is, those technologies that treat halogenated volatiles in ground water in situ.

"OR" is the default logic selection: if you do nothing, VISITT will insert "OR" as the logic discriminator when making your search and retrieving your records.

"AND" is a selected logic: if you wish to select "AND" you must choose it when prompted to do so by VISITT when you select search criteria and search values.

3.2 Performing a Search

The "Perform Search" command initiates the actual search through the VISITT database for the information you previously specified through the "Select Search Criteria" operation. When you initiate this operation, VISITT will provide you with a list of innovative technology vendors and their treatment technologies (refer to Figure 3.4) that correspond to the set of search criteria that you had specified earlier. (The technologies are organized by technology type and, within type, by developmental status, that is, bench scale, pilot scale, and full scale.)

VENDOR/TECHNOLOGY LIST

Found 74 Vendors with 109 of 277 Technologies Available

Vendor Names	Technology Types	Status
IT CORPORATION	ACID EXTRACTION	PILOT
BILLINGS & ASSOCIATES, INC.	AIR SPARGING - IN SITU GROUND WA	FULL
HAYWARD BAKER ENVIRONMENTAL, I	AIR SPARGING - IN SITU GROUND WA	FULL
IEG TECHNOLOGIES CORP.	AIR SPARGING - IN SITU GROUND WA	FULL
TERRA VAC, INC.	AIR SPARGING - IN SITU GROUND WA	FULL
VAPEX ENVIRONMENTAL TECHNOLOGI	AIR SPARGING - IN SITU GROUND WA	FULL
ECOLOGY TECHNOLOGIES INTERNATI	BIOREMEDIATION - IN SITU GROUND	FULL
ENSR CONSULTING AND ENGINEERIN	BIOREMEDIATION - IN SITU GROUND	FULL
EODT SERVICES, INC.	BIOREMEDIATION - IN SITU GROUND	PILOT
ESE BIOSCIENCES, INC.	BIOREMEDIATION - IN SITU GROUND	FULL
IT CORPORATION	BIOREMEDIATION - IN SITU GROUND	FULL
OHM CORPORATION	BIOREMEDIATION - IN SITU GROUND	FULL
WASTE STREAM TECHNOLOGY, INC.	BIOREMEDIATION - IN SITU GROUND	FULL
YELLOWSTONE ENVIRONMENTAL SCIE	BIOREMEDIATION - IN SITU GROUND	BENCH

[F3] for Printing Options
[↑↓]/[PgDn/PgUp] to Scroll, [Enter] to Select, [Esc] to Return

Figure 3.4: Vendor/Technology List

3.2.1 Preparing for a Search

If you have not already selected a set of search parameters through the "Select Search Criteria" operation, please refer to Section 3.1.2 before proceeding.

If you have built your search query by selecting specific search criteria and search values by following the steps outlined in Section 3.1.2, you are now ready to perform a search.

3.2.2 Performing a Search

Performing a search to retrieve vendor information records is simple.

Step 1: Select "Perform Search" by moving the highlight across the menu of the "Search by ..." screen to "Perform Search" and press **<Enter>** or press the letter **P**. The Vendor/Technology List will appear.

Step 2: Select a specific vendor and technology from the list with your ↑↓ keys and press **<Enter>**. At this point, the **General Vendor Information** record that you selected will be displayed.

Step 3: When you are finished viewing the information about a selected vendor and treatment technology, press **<Esc>** and you will return once again to the Vendor/Technology List. If you wish to perform another search, press **<Esc>** and move the highlight across the menu to "Clear Criteria" and press **<Enter>** or press the letter **C**. If you would like to view the records of another vendor and its associated treatment technology, select another line item with the ↑↓ keys and press **<Enter>** to view the complete records of another vendor and its innovative treatment technology.

3.3 Printing the Results of a Search: How To Use the Print Operation

Version 3.0 provides you with printing capabilities that make it easier to print information on vendors and technologies found through your query and to examine the technologies in relation to each other. In addition, VISITT 3.0 provides the user with a print preview option (refer to Section 3.3.4) that enables you to scroll through the selected print data on the screen before printing.

Use the **<F3>** key to access the print features in the system. Whenever the **<F3>** printing option can be used in VISITT, its availability will be noted at the bottom of the screen, along with several other options relevant to that screen or record. Printing is available for look-up tables, statistical summaries, the vendor and technology lists, and specific vendor information.

3.3.1 Print Look-Up Tables

If you want to print the information found in the look-up tables (refer to Figure 3.5), such as **Contaminant Groups**, **Technology Types**, or **Vendor Names**, press **<F3>**, and follow the printing operations explained in Sections 3.3.4 and 3.3.5.

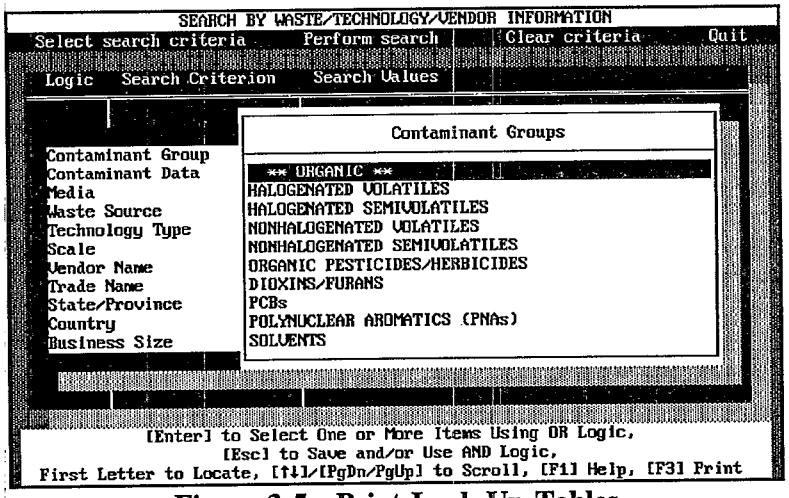

Figure 3.5: Print Look-Up Tables

3.3.2 Report Options Window

Printing at the Vendor/Technology List screen allows you to print information from more than one vendor record, using the Report Options Window (refer to Figure 3.6). Printing at this stage allows you to obtain information from all the vendor records that have been found through your query.

Pressing **<F3>** when you are positioned at the Vendor/Technology List will produce the Report Options window. In the Report Options window, you are given a list of information options:

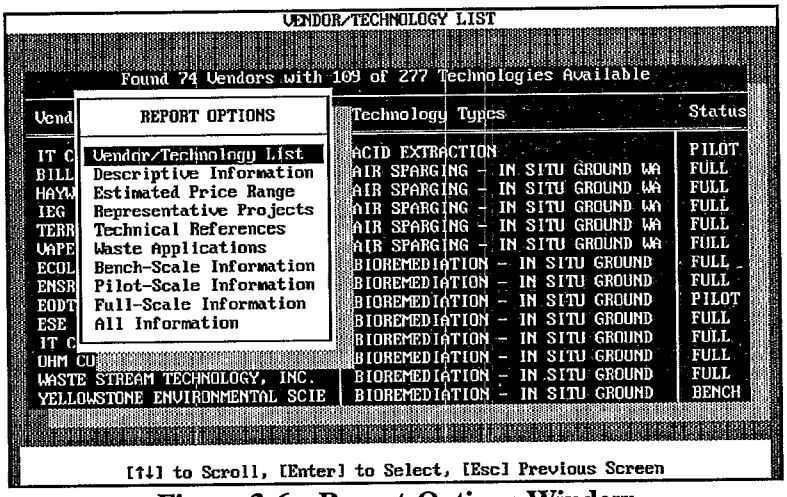

Figure 3.6: Report Options Window

- Vendor/Technology List
- Descriptive Information
- Estimated Price Range
- Representative Projects
- Technical References
- Waste Applications
- Bench-Scale Information
- Pilot-Scale Information
- Full-Scale Information
- All Information

You may select one option from the list for each printing job or select the **All Information** option to print all data. To print the Vendor/Technology List, highlight **Vendor/Technology List** and press **<Enter>**, or just press the letter **V**, and then follow the printing operations described in Sections 3.3.4 and 3.3.5.

Printing the Vendor/Technology List will give you the complete list (as shown on the screen) of vendors, technologies, and their respective scales of development for the technologies found in your search.

If you want to print descriptive information for all the technologies found through your query, highlight **Descriptive Information** and press **<Enter>** or press the letter **D**, and then follow the printing operations described in Sections 3.3.4 and 3.3.5. The **Descriptive Information** option includes the technology description, highlights, limitations, and other comments found in **Other Information Options** on the **General Vendor Information** screen discussed in Section 3.3.3.

To print the information from any of the other information options in the Report Options window, highlight the desired option and press **<Enter>**, or just press the first letter of the desired option, and then follow the printing operations explained in Sections 3.3.4 and 3.3.5.

Example of Print Report Options

You want to compare the performance data for all the soil washing technologies in VISITT. You begin by selecting the search category **Technology** and the search value **Soil Washing**. After establishing your search criteria and performing your search, VISITT will provide you with a Vendor/Technology List. At this point, press **<F3>** and the print Report Options window will appear. Highlight **Representative Projects** and press **<Enter>** or press the letter **R**. Follow the printing operations explained in Sections 3.3.4 and 3.3.5, and VISITT will provide you with a printout of all the representative projects with associated performance data for all the soil washing technologies in VISITT.

3.3.3 Print Selection Window

Pressing the print key **<F3>** when you are positioned at the **General Vendor Information** screen will allow you to select between two choices: (1) printing only the information on the highlighted selection from **Other Information Options** or (2) printing all the information available about the selected vendor.

To print all records, simply press the **<F3>** key while the **General Vendor Information** screen is displayed. The Print Selection window (refer to Figure 3.7) will

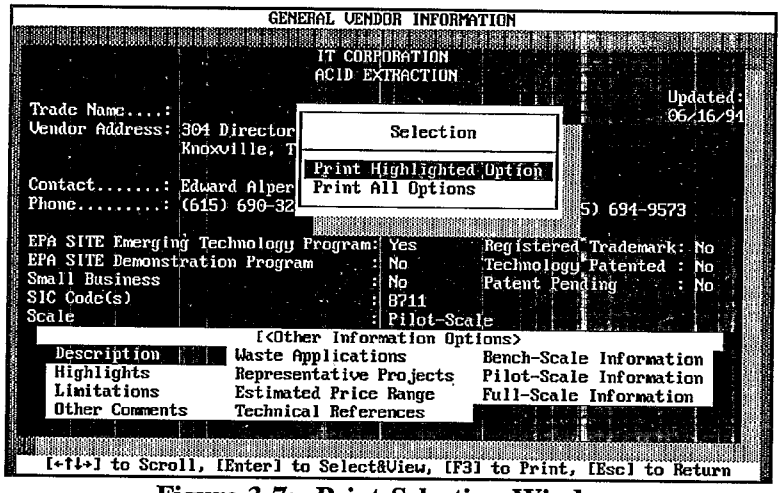

Figure 3.7: Print Selection Window

appear and prompt you to choose between printing the highlighted option or printing the full record. Highlight "Print All Options" with the ↑↓ keys, and press **<Enter>**. Your printout will be sent to the screen for a print preview. To obtain a hard copy, follow the printing operations explained in Sections 3.3.4 and 3.3.5.

To print a highlighted information option, first highlight one of the 11 **Other Information Options** displayed at the bottom of the **General Vendor Information** screen. Next, press **<F3>** to generate the Print Selection Window. Highlight "Print Highlighted Option" with the ↑↓ keys and press **<Enter>**. The Print Preview screen will appear.

3.3.4 Print Preview

After you have chosen the data that you want to print and before VISITT sends the data to the printer or a file, the system provides you with a print preview (refer to Figure 3.8). After activating a printing process with the **<F3>** key, VISITT will take a moment to prepare for the print preview. Print previews that require extended time to compile will be accompanied by a percentage bar indicator that will inform you when the print preview will be ready. The print preview displays the desired information on consecutive screens that you can view by scrolling with the ↑↓ keys. This option allows you to view the printout data on the screen.

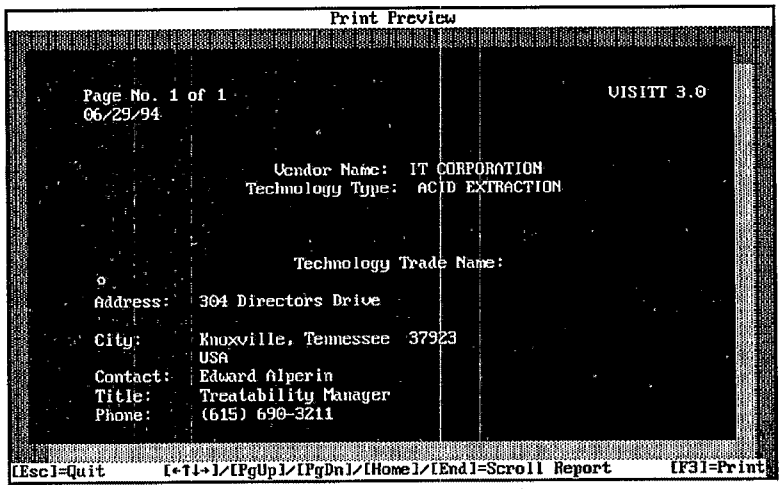

Figure 3.8: Print Preview

3.3.5 Printing Parameters Window

Pressing **<F3>** while in print preview generates a window that allows you to select or modify three of the four printing operation parameters, as shown in Figure 3.9: "Estimated Number of Pages," "Current Output," "Ready," and "Cancel." "Estimated Number of Pages" estimates the number of pages in the printout. You cannot modify the number of pages in the printout, but if the estimated number of pages in the printout will require more time to print than you would like, you can

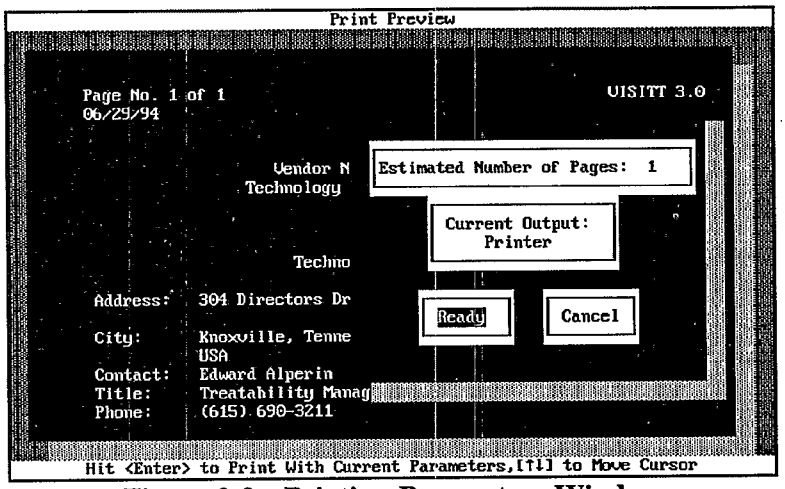

Figure 3.9: Printing Parameters Window

abort the print operation using the "Cancel" operation. "Current Output" designates the destination of your print operation -- either a DOS file or a printer. Sending your output to a DOS file allows you to create reports in other software packages, such as WordPerfect. (**NOTE:** You may need to cleanup some data when you transport text from a DOS file to other software packages such as WordPerfect. Steps one through four below describe a recommended method for importing DOS files from VISITT to WordPerfect.) "Ready" allows you to start a print operation, and "Cancel" allows you to stop it. Table 4 below provides definitions of the components and instructions for selecting the printing operation parameters.

Use the following steps when importing DOS files from VISITT to WordPerfect:

Step 1: After entering WordPerfect (5.0 or 5.1), simultaneously press **<Ctrl> <F5>**.

Step 2: Press **<1>** for "DOS Text".

Step 3: Press **<3>** for "Retrieve (CR/LF to [SRt] in HZone)".

Step 4: Type the disk drive, directory, and file name of the DOS text file that you specified while in VISITT. This process will take out unnecessary hard returns, but you will have to delete extra spaces in the text.

Table 4: Print Parameter Information and Commands

Printing Operation Parameter	Instructions
"Estimated Number of Pages"	Estimates the number of pages in the printout.
"Current Output"	Allows you to specify the destination for your print command. You may send your information to a printer or to a DOS file. Move the highlight with the ↑↓ keys to **"Current Output"** and press **<Enter>**. A window will appear on your screen, asking you to choose between a printer or a DOS file. Highlight your choice with the ↑↓ keys, and press **<Enter>**. If you choose a DOS file as the destination, VISITT will prompt you to enter as the destination a file name of as many as eight characters, plus a three-character file extension. This file automatically will be placed in the **VISITT** directory on your PC or network. When you've specified a file name, press **<Esc>**.
"Ready"	Sends the desired printout to your current output.
"Cancel"	Returns you to the previous screen (pressing **<Esc>** also will perform this operation).

3.4 Clearing the Key Terms From a Query With the "Clear Criteria" Command

The "Clear Criteria" command allows you to remove all the search criteria and search values, and any And/Or Logic and Potentially Could Be Treated or Actually Treated criteria you described during the "Select Search Criteria" operation.

To remove all the search criteria from your screen, highlight the "Clear Criteria" command and press **<Enter>** or press the letter **C**.

3.5 Quit

The "Quit" operation lets you exit the search operations portion of the VISITT system and return to main menu search categories. If you already are in the main menu, this option allows you to exit VISITT and return to DOS.

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4.0 SEARCH CATEGORIES

The VISITT search categories displayed horizontally on your screen allow you to search through VISITT for specific information by **Waste/ Technology/Vendor** and **Site** (refer to Figure 4.1). VISITT 3.0 expands your search capabilities as the Waste, Technology, Vendor, and Site categories of previous versions of VISITT have been condensed into two search categories. This enhancement provides you with additional search criteria with which you can better cross-reference and define your searches. Within each of these search categories, there is a submenu that identifies specific parameters, or limits, you can place on the search. These search categories and submenu parameters offer you the ability to fine-tune your search for information. (In addition to these search categories, the main menu contains four other items: **Reports**, **Introduction**, **Registration**, and **Quit**. See Sections 5, 6, and 7 for more information on the **Reports**, **Introduction**, and **Registration** features.) Table 5 below provides descriptions of the search categories and references for more information on the features.

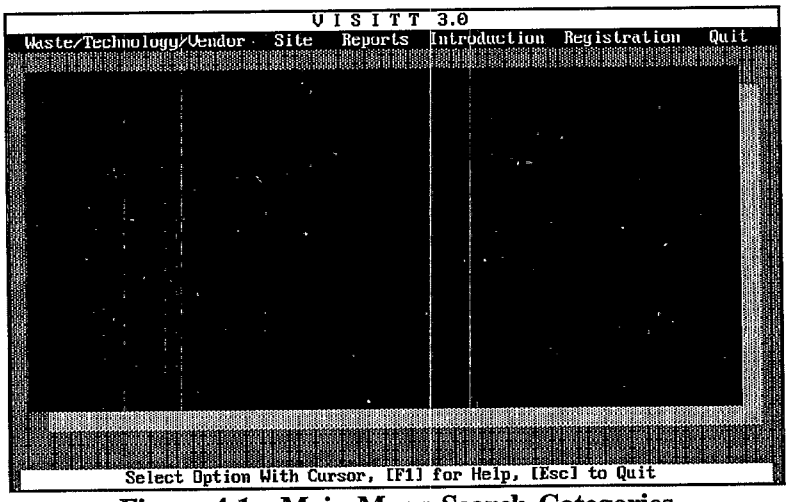

Figure 4.1: Main Menu Search Categories

Table 5: Overview of Main Menu Items

Category	Description	Manual Section
Waste/ Technology/ Vendor	The **Waste/Technology/Vendor** category allows you to retrieve records of treatment technologies that address a specific type of waste technology, or vendor. The **Waste/Technology/Vendor** category's submenu has eleven selections -- **Contaminant Group**, **Contaminant Data**, **Media**, **Waste Source**, **Technology Type**, **Scale**, **Vendor Name**, **Trade Name**, **State/Province**, **Country**, and **Business Size** -- that help you narrow your search.	4.1 Appendix B, D
Site	The **Site** category allows you to obtain the records of specific types of treatment technologies based on the sites for which the vendors have provided project data. The **Site** category's submenu has nine selections -- **Site Name**, **Cleanup Type**, **State/Province**, **Country**, **Equipment Scale**, **Waste Source**, **Media**, **Contaminant Data**, and **Regulation/Statute/ Organization** -- that help you narrow your search.	4.2 Appendix B, C, D

Table 5: Overview of Main Menu Items (continued)

Category	Description	Manual Section
Reports	This main menu feature allows you to obtain a quick summary of the number of technologies in the VISITT database by scale of development for each technology type, the contaminant groups treated by the technologies, and the number of waste sources treated by the technologies.	5.0
Introduction	This main menu feature provides you with a brief introduction to and overview of the VISITT system, describing the contents of the system and generally how to navigate through the database.	6.0
Registration	This main menu feature allows you to print a registration form that you can use to register as a VISITT user, if you have not already done so. By registering, you will be notified of VISITT updates.	7.0

4.1 Waste/Technology/Vendor

This main menu category allows you to retrieve records of vendors or treatment technologies. The search parameters are contained in look-up tables accessible through the **Waste/ Technology/Vendor** search category submenu (refer to Figure 4.2). To view this submenu and its search criteria -- **Contaminant Group, Contaminant Data, Media, Waste Source, Technology Type, Scale, Vendor Name, Trade Name, State/Province, Country,** and **Business Size:**

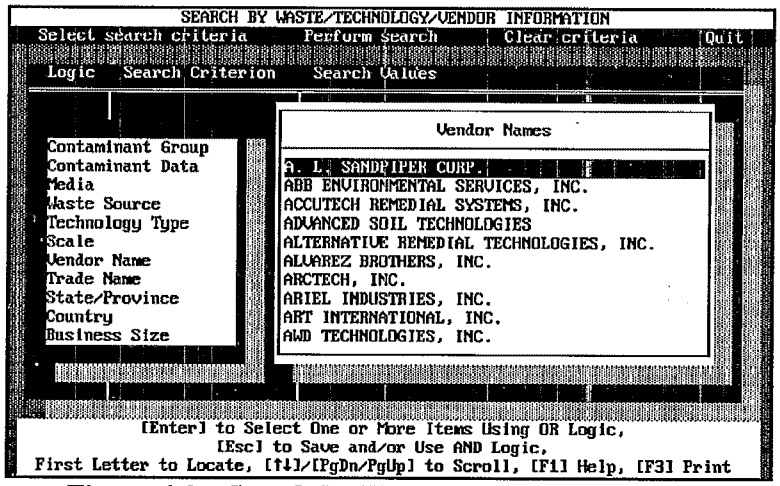

Figure 4.2: Search by Waste/Technology/Vendor: Submenu and Look-Up Table

Move the highlight with the **↑ ↓ keys** along the main menu to **Waste/Technology/Vendor** and press **<Enter>** or press the letter **W**. (If you decide that the items in the submenu are not appropriate for your search, simply press **<Esc>** to return to the main menu.)

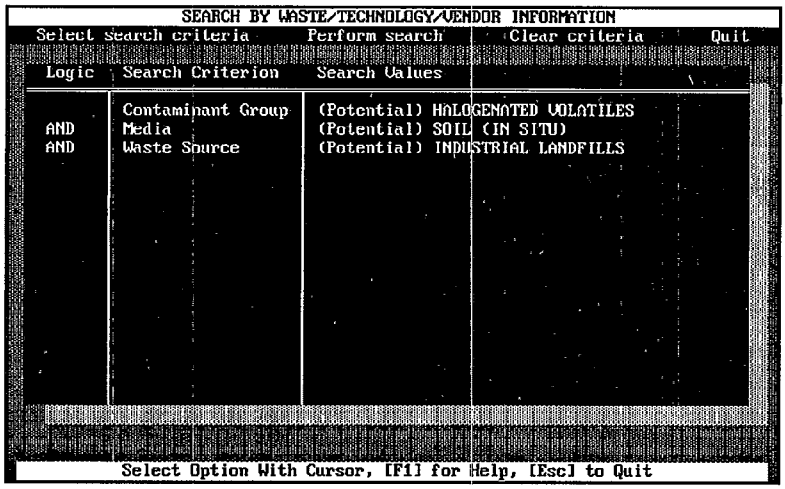

Figure 4.3: Sample Query by Waste/Technology/Vendor

Appendix B provides full descriptions of each submenu item in the **Waste/Technology/Vendor** category. Appendix D lists the contaminant group codes for hazardous substances.

Example of a Search Using the Waste/Technology/Vendor Category

If you are interested in looking up all the technologies available for treating **Soil (in situ)** contaminated with **Halogenated Volatiles** for **Industrial Landfills**:

Select **Contaminant Group** from the submenu, press **<Enter>**, specify the "POTENTIALLY Could Be Treated or ACTUALLY Treated" option, and select **Halogenated Volatiles** from the **Contaminant Group** look-up table. Press **<Esc>**.

Then select **Media** from the submenu, press **<Enter>**, specify And/Or logic, specify the "POTENTIALLY Could Be Treated or ACTUALLY Treated" option, and select **Soil (in situ)** from the **Media** look-up table. Press **<Esc>**.

Then select **Waste Source** from the submenu, press **<Enter>**, specify both And/Or logic and the "POTENTIALLY Could Be Treated or ACTUALLY Treated" option and select **Industrial Landfills** from the **Waste Source** look-up table. When you have completed your selection process, press **<Esc>** to lock in the search criteria and search values (refer to Figure 4.3).

VISITT will retrieve from the database all the technologies that meet your criteria. You then can view them in turn or select a few to examine at length. (See Section 3.0 of the manual for detailed instructions on selecting search criteria and performing a search.)

4.2 Site

This main menu category allows you to obtain records of treatment technologies for a site. The search parameters -- **Site Name, Cleanup Type, State/Province, Country, Equipment Scale, Waste Source, Media, Contaminant Data,** and **Regulation/Statute/Organization** -- are contained in look-up tables accessible through the **Site** search category's submenu (refer to Figure 4.4). To view this submenu and its search criteria:

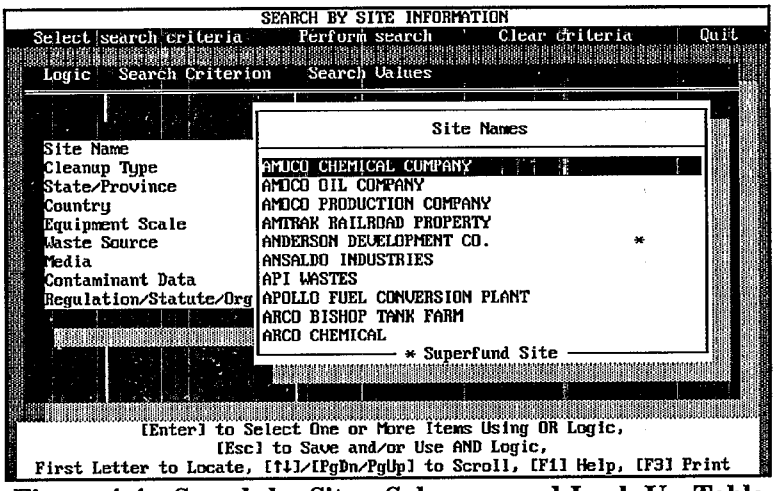

Figure 4.4: Search by Site: Submenu and Look-Up Table

Move the highlight with the ↑ ↓ keys along the main menu to **Site** and press **<Enter>** or press **S.** (If you do not want the items in the submenu, simply press **<Esc>** to return to the main menu.)

Example of a Search Using the Site Category

If you are interested in a vendor who has done work on a site using a technology at a particular equipment scale -- a **defense contractor** that does **full-scale cleanup**, for example -- and you want to learn if there are any technologies offered by vendors that adhere to the options you have in mind:

Select **Site Name** from the submenu, press **<Enter>**, and select **Defense Contractor** from the **Site Name** look-up table. Press **<Esc>**.

Then select **Cleanup Type** from the submenu, press **<Enter>**, specify the And/Or option, and select **Full-Scale Cleanup** from the **Cleanup Type** look-up table. Press **<Esc>**.

When you have completed your selection process, press **<Esc>** to lock in the search criteria and search values (refer to Figure 4.5).

VISITT will retrieve from the database all the information that meet your criteria. You then can view them in turn or select a few records to examine at length. (See Section 3.0 of the manual for detailed instructions on selecting search criteria and performing a search.)

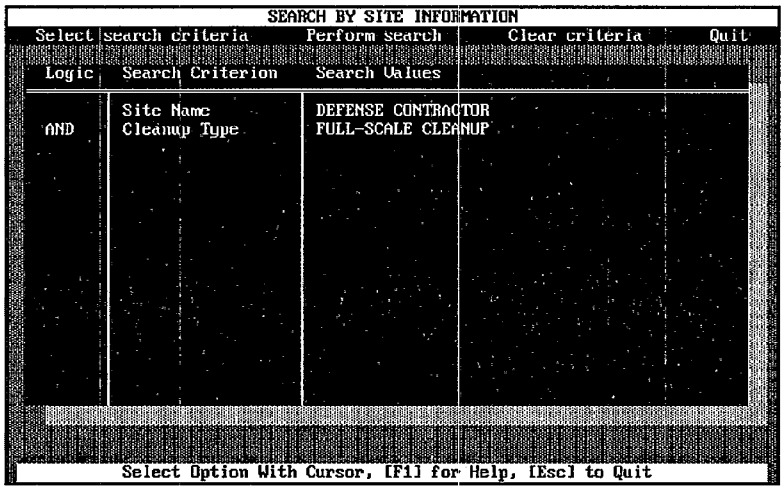

Figure 4.5: Sample Query by Site Category

Appendix B provides full descriptions of each submenu item in the **Site** category. Appendix C provides full definitions of VISITT technology types. Appendix D lists the contaminant group codes for hazardous substances.

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5.0 REPORTS

This main menu feature allows you to get a quick summary of the number of technologies in the VISITT database in three areas: **Technologies by Scale of Development, Contaminant Group(s) Treated,** and **Industries and Site Types Addressed**. To view the reports, move the highlight along the main menu to **Report** and press **<Enter>** or press the letter **R**. The three reports are displayed on a total of seven consecutive screens.

5.1 Technologies by Scale of Development

This three-screen report lists the technology types alphabetically and indicates numbers of bench-, pilot-, and full-scale technologies and the total for each technology type.

5.2 Contaminant Group(s) Treated

This two-screen report contains a summary of the number of treatment technologies in the VISITT database that can treat specific contaminant groups.

5.3 Industries and Site Types Addressed

This two-screen report contains a summary of the number of treatment technologies in the VISITT database that treat wastes generated by specific industrial sources and site types.

6.0 INTRODUCTION

In addition to the search categories located on the main menu, the **Introduction** option provides you with a brief overview of the system, describing the contents of the system and the method of navigating through the database. To access the **Introduction** option, move the highlight to **Introduction** and press **<Enter>** or press the letter **I** (refer to Figure 6.1).

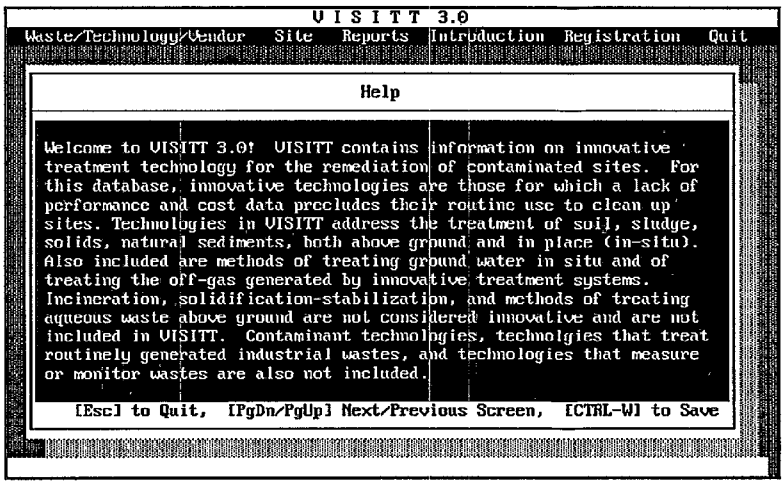

Figure 6.1: Introduction Submenu

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7.0 REGISTRATION

In the event that you have obtained VISITT and have not had an opportunity to register as a user, the **Registration** option allows you to print a blank registration form. To access the **Registration** option, move the highlight to **Registration** and press <Enter> or press the letter **R** (refer to Figure 7.1).

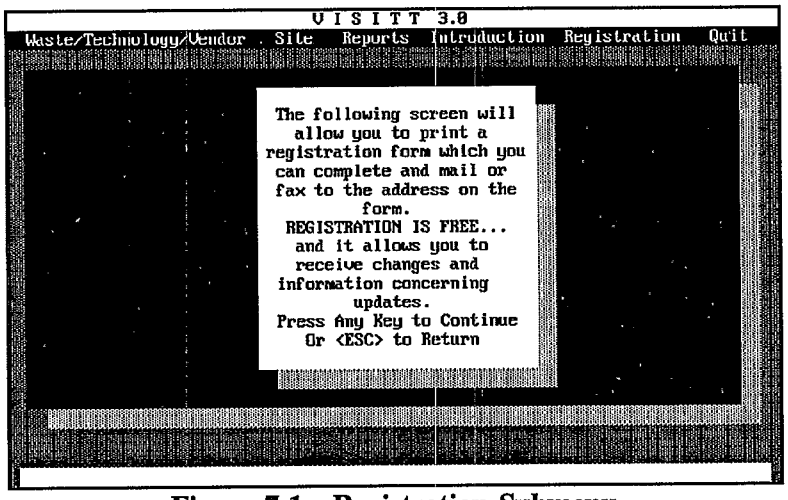

Figure 7.1: Registration Submenu

7.1 Registration Option

This command provides you with the option to print a blank registration form. To print the registration form, press any key at the Registration Submenu screen. After pressing any key, the system will provide you with the printing parameters window. Follow the procedures explained in Section 3.3.5 to print the form. After you have completed the form, send it by mail or facsimile it to the address or number indicated.

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8.0 THE VENDOR INFORMATION RECORD

The principal unit of information in the VISITT database is called the Vendor Information Record. Each record contains the key words and criteria that match the submenu selection criteria you specify during your "Select Search Criteria" selection operations. The Vendor Information Record has two parts: (1) the **General Vendor Information** screen and (2) the **Other Information Options** submenu. Figure 8.1 shows the **General Vendor Information** screen and its components.

The **General Vendor Information** screen supplies the vendor's name and address, the technology type and trade name, the status of the technology's application (bench, pilot, or full scale), an indication of whether the technology is included in EPA's Superfund Innovative Technology Evaluation (SITE) program (see Appendix B for more information on EPA the SITE program), trademark and patent information, whether or not a vendor is a "small" business, the vendor's SIC code(s), and a contact name and phone number.

The **Other Information Options** submenu furnishes descriptions of the technology and available performance information (refer to Figure 8.1). This submenu's 11 options are listed below and are described in more detail in the sections that follow.

- Description
- Highlights
- Limitations
- Other Comments
- Waste Applications
- Representative Projects
- Estimated Price Range
- Technical References
- Bench-Scale Information
- Pilot-Scale Information
- Full-Scale Information

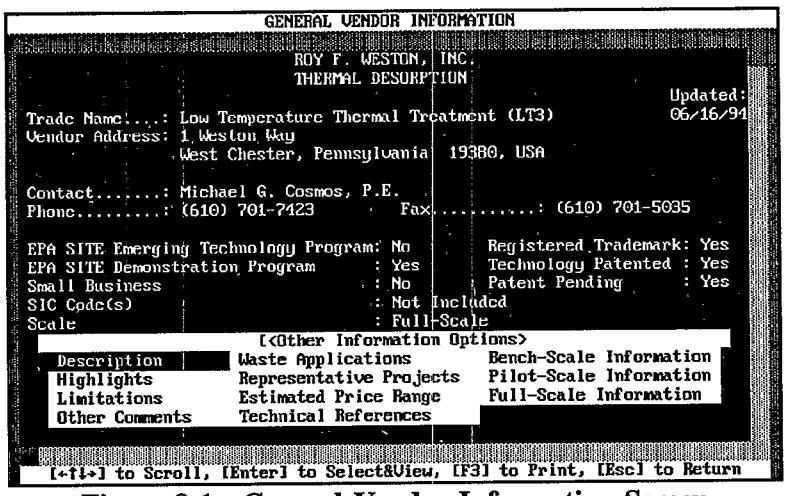


Figure 8.1: General Vendor Information Screen

For options with multiple screens, the screen currently being viewed and its position relative to the total number of screens is indicated by the message "Record (or Screen) x of n," where x is the current record (or screen) and n is the total number of records (or screens).

8.1 Description

The Description option provides a brief general description of the treatment process (Figure 8.2). The description includes important operating principles that apply to the technology, the key treatment processing steps, any unique features of the technology, and an indication of whether the full-scale system is or will be batch, continuous, or semicontinuous.

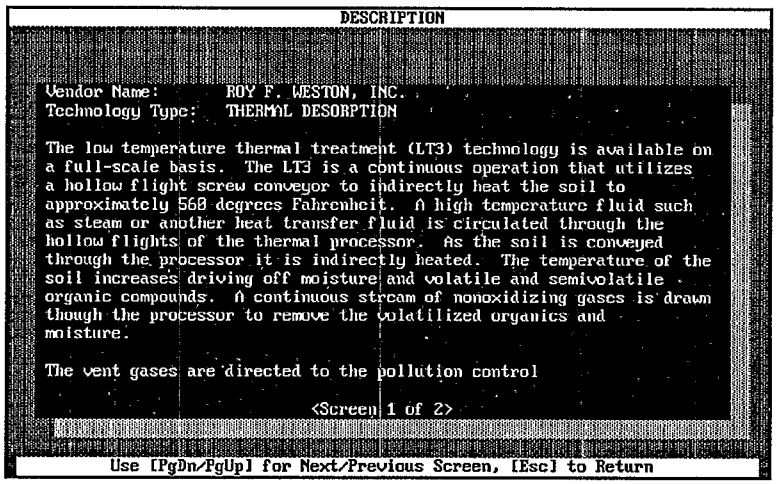


Figure 8.2: Technology Description Screen

8.2 Highlights

The Highlights option provides a description of the principal features of the innovative treatment technology, focusing on such considerations as the technology's treatment niche and its advantages over other technologies (Figure 8.3).

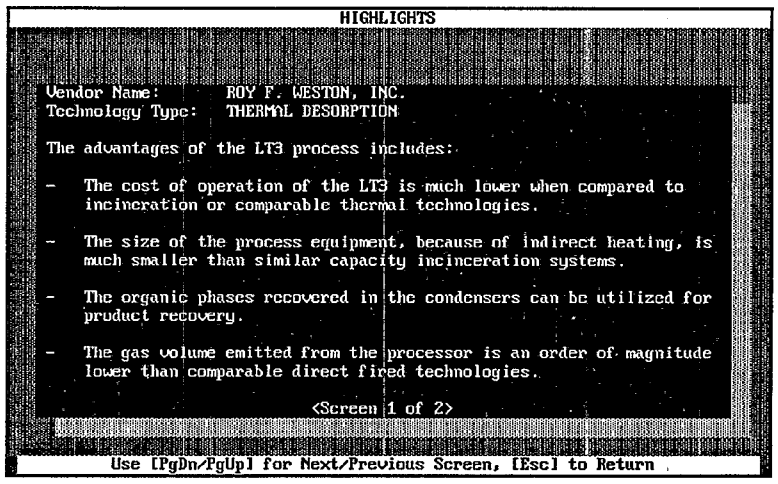


Figure 8.3: Highlights Screen

8.3 Limitations

The Limitations option, a submenu selection on the **General Vendor Information** screen, is a brief description of the key factors that could affect the applicability or the performance of the innovative treatment technology (Figure 8.4).

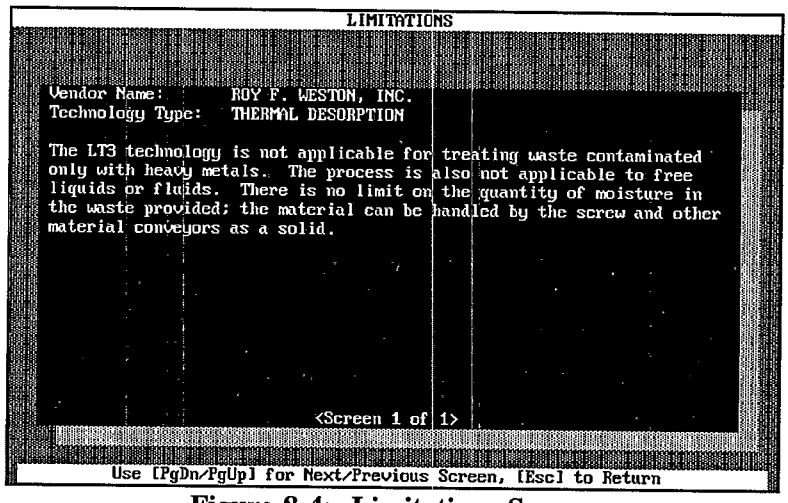


Figure 8.4: Limitations Screen

8.4 Other Comments

The Other Comments option provides a description written by the vendor of the treatment technology's status, capabilities, and experience (Figure 8.5). This screen allows the vendor to discuss additional aspects of the technology or its demonstrated experience.

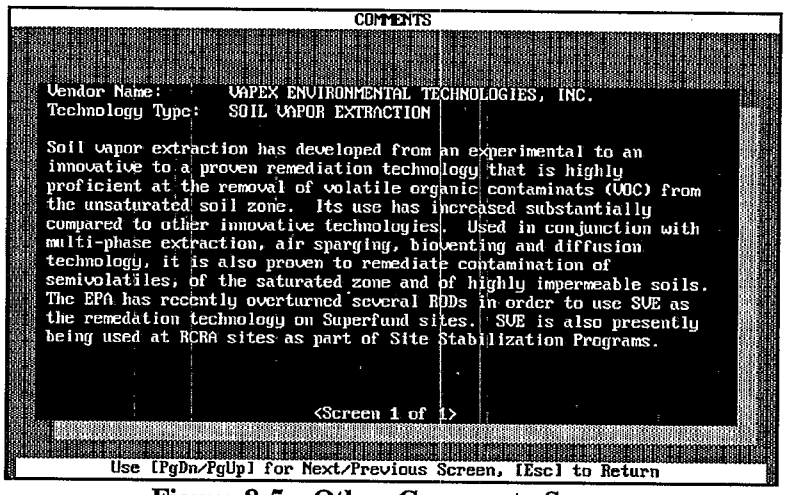


Figure 8.5: Other Comments Screen

8.5 Waste Applications

The Waste Applications option provides specific information on the following:

- The wastes or media that the vendor actually has treated or those that the technology can treat (Figure 8.6),
- The potential or actual contaminant groups treated by the technology
- The potential or actual industrial sources or site types that the technology can address

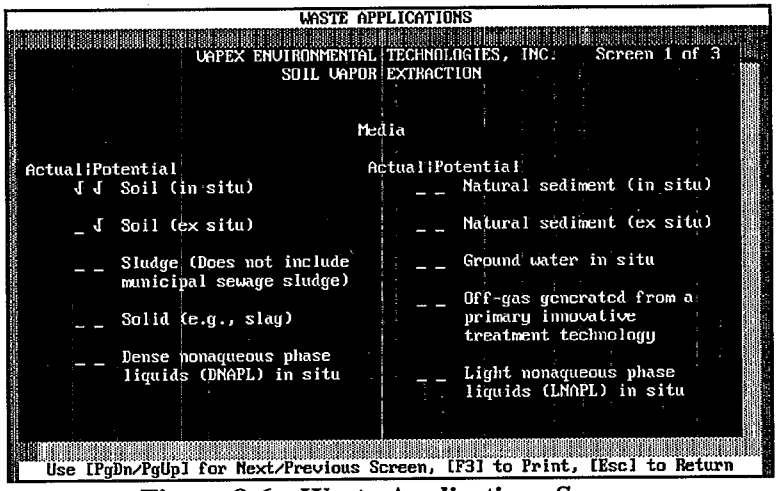


Figure 8.6: Waste Applications Screen

8.6 Representative Projects

The Representative Projects option presents detailed site information for separate projects employing the innovative treatment technology. The primary screen in the Representative Projects option presents a project selection list (Figure 8.7). Press **<Enter>** to access the detailed information about the vendor's performance at a specific site. To scroll from item to item, use the ↑↓ keys.

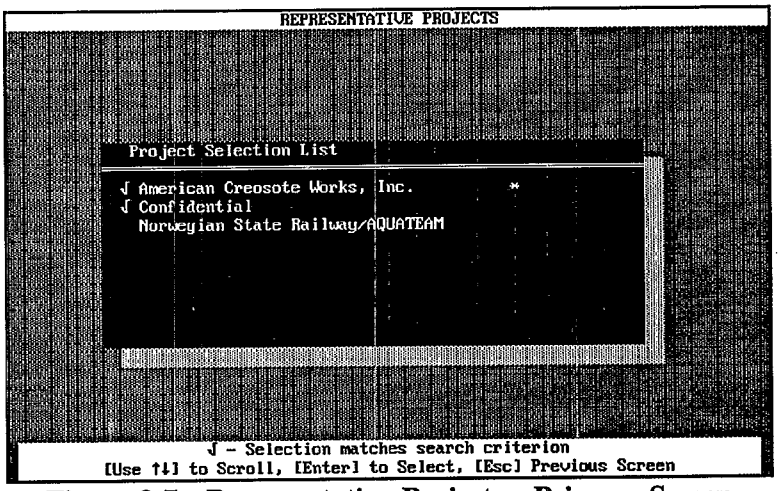


Figure 8.7: Representative Projects: Primary Screen

VISITT 3.0 includes a new feature that helps you identify the specific project(s) that matches the search values that you specified in your search. Those projects are indicated by a check mark to the left of the project name (Figure 8.7). Representative project sites that are Superfund sites are designated by an asterisk to the right of the site name (Figure 8.7).

Subsequent screens of the Representative Projects option contain 14 discrete blocks of information relevant to the treatment technology's representative project:

- Site name
- Location
- Project Status
- Equipment Scale
- Treatment Location
- Industrial Waste Sources or Site Types
- Media
- Regulation/Statute/ Organization
- Volume/Quantity/Area/Depth
- Application Type
- Cost Information
- Performance Data
- Contact
- Literature References

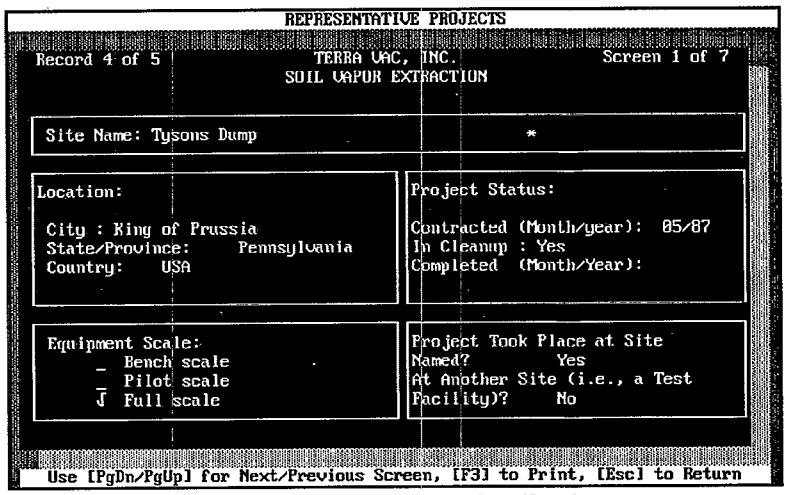


Figure 8.8: Representative Projects Screen: Secondary Screen

The first five blocks of project information -- **Site Name**, **Location**, **Project Status**, **Equipment Scale**, and **Site Information** -- are shown in the first Representative Projects screen (Figure 8.8). The latter 10 blocks of project information -- **Industrial Waste Sources or Site Types**, **Media**, **Regulation/Statute/Organization**, **Representative Projects**, **Volume/Quantity**, **Application Type**, **Cost Information**, **Performance Data**, **Contact**, and **Literature References** -- are found on the subsequent Representative Projects screens.

To view the separate memo screens "attached" to the **Industrial Waste Sources or Site Types Treated** block, the **Application Type** block, and the **Literature References** block, press **<F2>**.

A VISITT 3.0 enhancement links performance data to specific representative projects (if provided by the vendor). Screen 6 for each project provides a list of the contaminants treated on the site, the untreated contaminant concentration range, and the treated contaminant concentration range (Figure 8.9). A highlight bar is provided to help you read the performance data for each contaminant. Some vendors have provided treatment goals for the contaminants on the site. You can view the treatment goal by pressing **<F8>** at the Performance Data screen. To return to the primary Performance Data screen, press **<F8>** again.

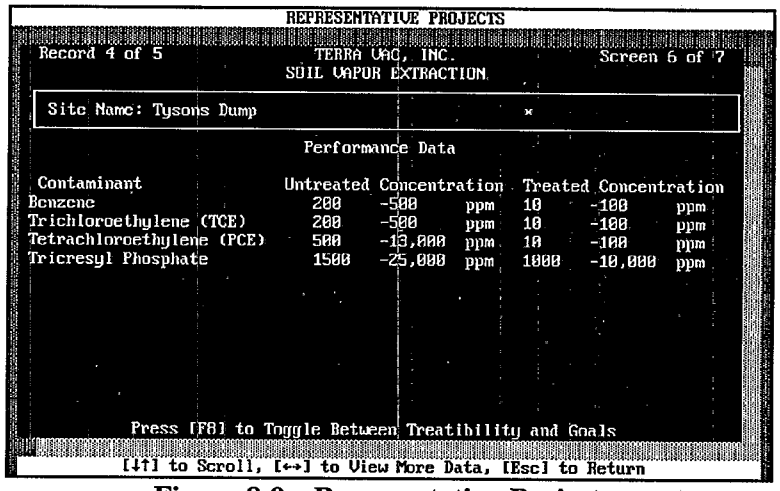


Figure 8.9: Representative Projects: Performance Data Screen

The current screen being viewed and its position relative to the total number of summaries for the technology is indicated by the message "Record x of n" at the top right of the screen (x is the current record; n is the total number of records for a technology). Use the **PgUp/PgDn** keys to scroll through the screens. Pressing **<Esc>** will return you to the Representative Projects screen.

8.7 Estimated Price Range

The Estimated Price Range option provides two screens, one that shows a "ballpark" estimated price range per unit of waste treated (Figure 8.10) and a second that shows a ranking of specific factors that affect the price per unit of waste treated.

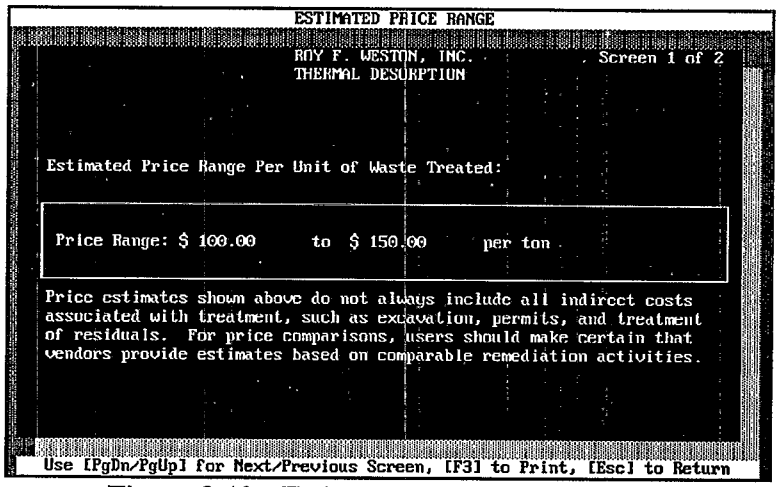


Figure 8.10: Estimated Price Range Screen

8.8 Technical References

The Technical References option allows you to view a list of documents or articles that provide additional information on the technology and capabilities of the vendor (Figure 8.11). Document numbers, including EPA, National Technical Information Service (NTIS), and patent numbers, are given, if applicable, to help you order the items. Abstracts of many of the references are available in the ATTIC system, an online system operated by EPA's Office of Research and Development. Appendix G provides more information on the ATTIC system.

```
TECHNICAL REFERENCES
Record 1 of 4          ROY F. WESTON, INC.          Screen 1 of 1
                       THERMAL DESORPTION

Author(s):
Cosmos, M., Nielson, R.

Title:
Low Temperature Thermal Treatment Technology for Onsite Remediation

Journal/Conference:
Separation Science and Environmental Chemists

Date:    /
NTIS/EPA Document Number(s):

Use [PgDn/PgUp] for Next/Previous Screen, [F3] to Print, [Esc] to Return
```

Figure 8.11: Technical References Screen

8.9 Bench-Scale Information

The Bench-Scale Information option (Figure 8.12) provides information on the capability of the vendor to conduct treatability studies and the number of studies conducted to date. This screen also provides a memo field that describes bench-scale testing procedures for the technology.

```
BENCH-SCALE INFORMATION
                       ROY F. WESTON, INC.          Screen 1 of 1
                       THERMAL DESORPTION

Treatability Study Capabilities (Bench-Scale)

Can you conduct bench-scale treatability studies on some
types of waste at your location ? Yes

Number of bench-scale studies conducted to date.
(Does not include tests on surrogate wastes.):    20

Description of bench-scale testing procedures: Memo (F2) to display)

Use [PgDn/PgUp] for Next/Previous Screen, [F3] to Print, [Esc] to Return
```

Figure 8.12: Bench-Scale Information Screen

8.10 Pilot-Scale Information

The Pilot-Scale Information option provides information on the components of the pilot-scale treatment system, including the pre- and postprocessing components.

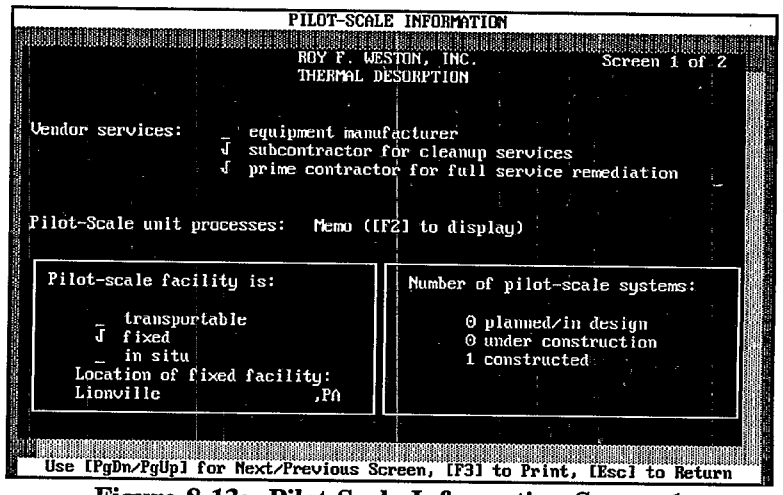


Figure 8.13: Pilot-Scale Information Screen 1

The first screen in the Pilot-Scale Information series (Figure 8.13) provides the following information:

- Indication of whether the vendor is the equipment manufacturer, will subcontract for cleanup services, or will be the prime contractor for full-service remediation
- A memo field describing of the processes and components of the treatment technology
- The number of pilot-scale systems planned, in design, under construction, or constructed
- Indication of whether the pilot-scale treatment facility is transportable, fixed, or in situ

Components of the pilot-scale treatment system are discussed in a separate, attached memo screen. You can access that screen by pressing **<F2>**. To exit the memo screen and return to the Pilot-Scale Information series, press **<Esc>**. Use the **PgUp/PgDn** keys to move to the next or previous screen in the series.

The second screen in the Pilot-Scale Information series (Figure 8.14) indicates:

- The capacity range per hour of the pilot-scale treatment system or a prorated capacity for batch processes
- The location of pilot-scale treatability studies (either at the vendor's location or at a contaminated site)
- The quantity of waste required for a pilot-scale treatability study
- The number of pilot-scale studies conducted on wastes from different sources or sites

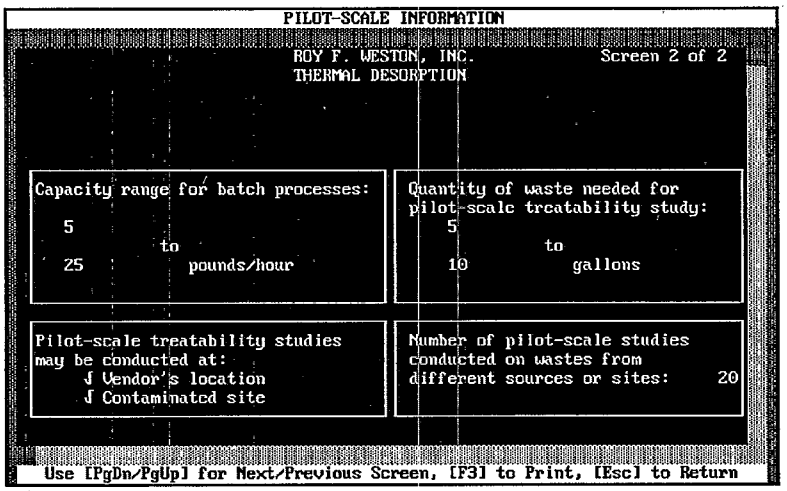


Figure 8.14: Pilot-Scale Information Screen 2

8.11 Full-Scale Information

The Full-Scale Information option provides information on the components of the full-scale treatment system, including the pre- and post-processing components. The first screen in the Full-Scale Information series (Figure 8.15) provides the following information:

- Indication of whether the vendor is the equipment manufacturer, will subcontract for cleanup services, or will be the prime contractor for full-service remediation

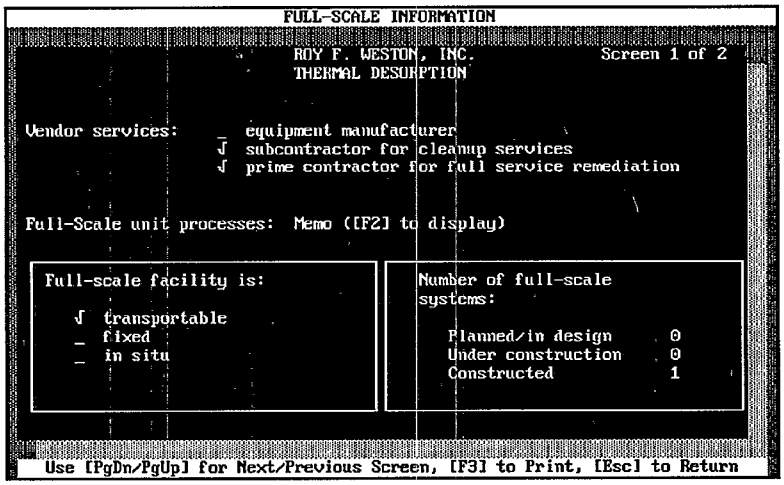


Figure 8.15: Full-Scale Information Screen 1

- The number of full-scale systems planned, in design, under construction, or constructed
- Indication of whether the full-scale system is transportable, fixed, or in situ
- A memo field describing the equipment and application process

Components of the full-scale treatment system are discussed in a separate, attached memo screen. You can access that screen by pressing **<F2>** (refer to Figure 8.15). To exit the memo screen and return to the Full-Scale Information series, press **<Esc>.** Use the **PgUp/PgDn** keys to move to the next or previous screen in the series.

The second screen in the Full-Scale Information series (Figure 8.16) indicates the following:

- The capacity range per hour of the full-scale treatment process
- The number of full-scale cleanups initiated or completed by the vendor using this technology
- For equipment manufacturers, the estimated or actual number of full-scale cleanups conducted by other firms through application of this technology

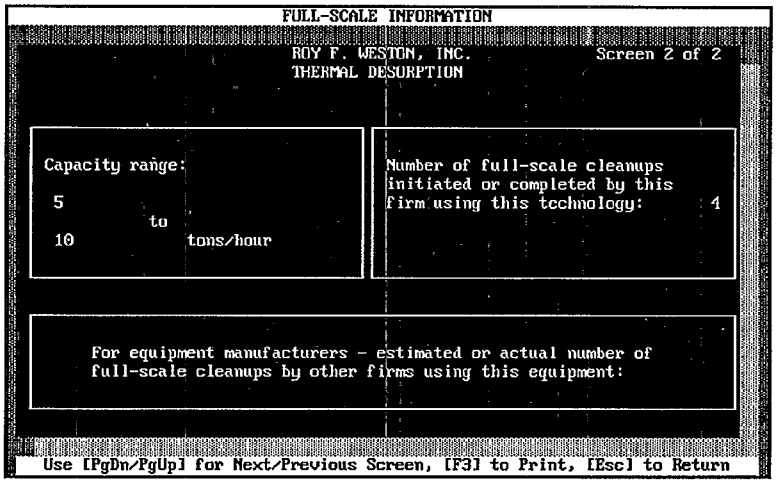


Figure 8.16: Full-Scale Information Screen 2

APPENDIX A

SUPERFUND INNOVATIVE TECHNOLOGY EVALUATION (SITE) PROGRAM FACT SHEET

United States Environmental Protection Agency
Office of Solid Waste and Emergency Response
9380.1-03AFS
May 1991

EPA

Superfund Innovative Technology Evaluation Program

SITE Program Fact Sheet

SITE PROGRAM OVERVIEW

The Superfund Innovative Technology Evaluation (SITE) program supports development of technologies for assessing and treating waste from Superfund sites. The SITE program was authorized by the Superfund Amendments and Reauthorization Act of 1986 with the goal of identifying technologies, other than land disposal, that are suitable for treating Superfund wastes. The program provides an opportunity for technology developers to demonstrate their technologies' capability to successfully process and remediate Superfund waste. EPA evaluates the technology and provides an assessment of potential for future use for Superfund cleanup actions. The SITE program has currently evaluated or supported research efforts for more than 100 innovative treatment technologies. The SITE program is administered by EPA's Risk Reduction Engineering Laboratory (RREL) in Cincinnati, Ohio.

This fact sheet describes the five components of the SITE Program with particular emphasis on the Demonstration Program, which conducts evaluation demonstrations of operating alternative technologies. This page of the fact sheet summarizes the overall SITE Program. Subsequent pages provide additional detail about each program component. This fact sheet also contains a list of contacts for further information, and an order form for technology transfer publications and videos.

COMPONENTS OF THE SITE PROGRAM

The SITE program integrates five related components, the Demonstration Program, the Emerging Technologies Program, the Monitoring and Measurement Technologies Program, the Innovative Technologies Program, and Technology Transfer Activities.

DEMONSTRATION PROGRAM

The Demonstration Program provides engineering, cost, reliability, and applicability data on new Superfund remediation technologies by sponsoring field demonstrations of pilot or full-scale technologies. Technology developers demonstrate their methods on selected wastes, and EPA analyzes, evaluates and disseminates the test results. Typically, no funding is made available to the developer during this process. Figure 1 illustrates the categories of technologies currently enrolled in the Demonstration Program.

EMERGING TECHNOLOGIES PROGRAM

The Emerging Technologies Program (ETP) supports the development of new, innovative technologies by following laboratory and bench-scale technologies through pilot-scale testing. The ETP provides up to two years of financial assistance to private developers for technology research and development through cooperative agreements.

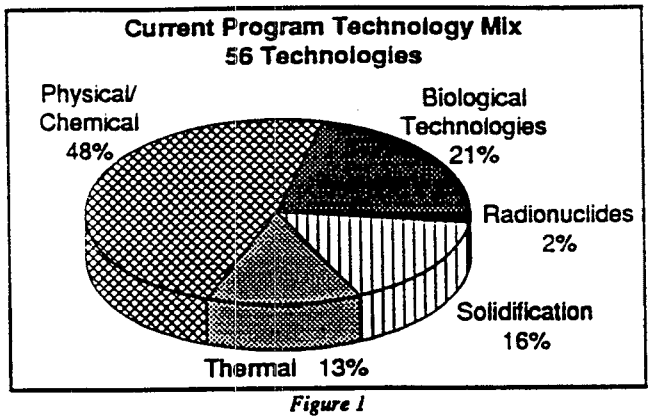


Figure 1

MEASUREMENT AND MONITORING TECHNOLOGIES PROGRAM

The Monitoring and Measurement Technologies Program (MMTP) is designed to improve the accuracy of Superfund site characterization efforts. The MMTP tests the ability of advanced technologies to assess the nature and extent of contamination, and evaluate cleanup levels. Funding is generally not provided to developers under this program.

INNOVATIVE TECHNOLOGIES PROGRAM

The aim of this program is to encourage private sector development and commercialization of EPA-developed hazardous waste treatment technologies for use at Superfund sites. The Federal Technology Transfer Act of 1986 authorized the EPA/industry partnership that is necessary to bring these technologies to commercialization. This will enable EPA laboratories to collaborate with industry, thus facilitating development of the technologies and reducing the market risk.

TECHNOLOGY TRANSFER

The Technology Transfer portion of the SITE program disseminates information from the other four programs to increase awareness and use of alternative technologies for assessing and remediating Superfund sites. Technology transfer occurs through reports, brochures, videos, seminars, public meetings and site visits, conference exhibits, and technical support to EPA Regions, States, and Superfund contractors.

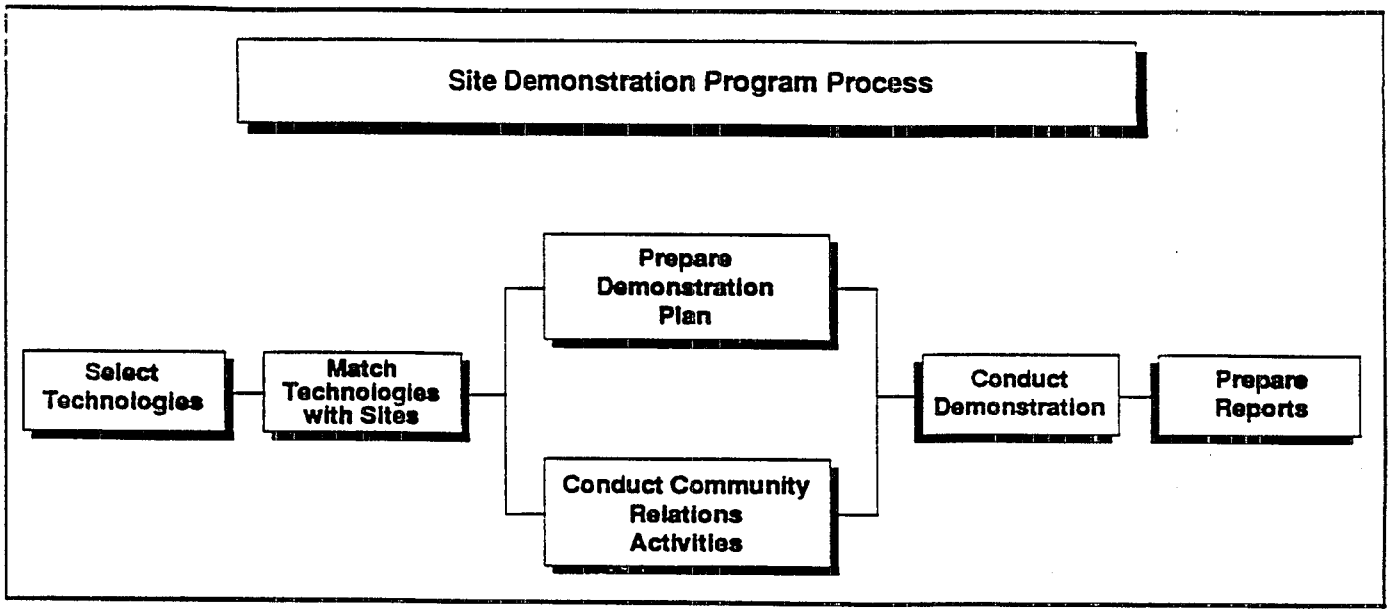


Figure 2

DEMONSTRATION PROGRAM PROCESS

The Demonstration Program selects technologies and conducts field demonstrations through the process illustrated in Figure 2. Each step in the process is discussed below.

Select Technologies: In January of each year EPA solicits applications for the demonstration program. Developers submit proposals which are reviewed and approved by EPA.

Match Technologies with Site: EPA and the developer select a site for the demonstration based on several considerations: the developer's waste and location preferences, relevance of the technology to the site cleanup, and Regional needs. EPA meets with Regional and State representatives, the developer and other interested parties to visit sites prior to making a final selection.

Prepare Demonstration Plan: EPA develops a Demonstration Plan that details how to sample waste for testing, prepare the selected site for the demonstration, dispose of residual materials, and evaluate the technology in the field. Both EPA and the technology developer must approve the Demonstration Plan.

Conduct Community Relations Activities: In most cases, opportunity for public comment is required prior to the actual demonstration. EPA prepares fact sheets on the demonstration, designates a period for the public to comment, and may hold local public meetings and/or land site visits.

Conduct Demonstrations: The demonstration of the selected technology can last from a few days to several months. The technology developer is financially responsible for mobilizing and operating the technology. EPA prepares the site, provides utilities, collects samples, performs QA field and laboratory audits, and evaluates the results. EPA also handles the logistical arrangements for a Visitor's Day where the Regional and State officials, the public and interested professionals are invited to view the demonstration.

Prepare Reports: After the demonstration, EPA prepares a Technology Evaluation Report which presents a summary of the demonstration and evaluation results. In addition, EPA prepares an Applications Analysis Report that assesses the overall applicability of the technology to other sites and waste, and includes technology cost, performance, and reliability information.

EMERGING TECHNOLOGIES PROGRAM (ETP) HIGHLIGHTS

The Emerging Technologies Program is supporting the development of 31 technologies. Constructed wetlands, electroacoustical decontamination, and laser-stimulated photochemical oxidation are some of the methods being investigated. Recent program efforts have focused on increasing the number of viable biological treatment technologies. Technology developers enter the ETP by submitting pre-proposals in the fall of each year. From the pre-proposals EPA selects qualified developers to submit cooperative agreement applications, and funds are provided to successful applications the following spring.

Emerging Technologies projects are initially funded for one year, with an additional year of funding available to projects that show significant progress. Annual funding of up to $150,000 ($300,000 maximum for two years) is available.

MEASUREMENT AND MONITORING TECHNOLOGIES PROGRAM OBJECTIVES

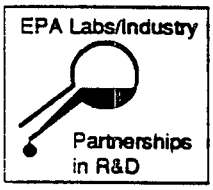
The Measurement and Monitoring Technologies Program, based at EPA's Environmental Monitoring System Laboratory in Las Vegas, Nevada, sponsors research on advanced Superfund

site assessment technologies. MMTP objectives include:

- Identifying existing technologies that can enhance field monitoring and site characterization;
- Supporting development of monitoring capabilities that cannot be cost-effectively addressed with current technology;
- Demonstrating those technologies that emerge from the screening and development phases of the program; and
- Preparing protocols, guidelines and standard operating procedures for new methods.

For further information on MMTP, please contact Eric Koglin, FTS 545-2432 or (702) 798-2432.

INNOVATIVE TECHNOLOGIES PROGRAM

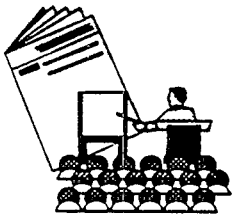


Through cooperative research and development agreements (CRDAs), EPA laboratories will work closely with industry to develop and commercialize on-site destruction and hazardous waste cleanup technologies. Through the program, EPA is involved in the development of a variety of technologies. Examples include:

- Mobile Debris Washer;
- Base Catalytic Destruction System (BCD - APEG -KPEG);
- Volume Reduction Unit (VRU); and
- Excavation Technique and Foam Suppression Methods.

For further information on this program, contact Steve James at (513) 569-7877.

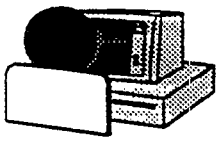
TECHNOLOGY TRANSFER



Technical information gathered through all of the SITE programs is exchanged through a variety of activities. Data results and status updates are disseminated to increase awareness of alternative technologies available for use at Superfund sites. A wide array of media are utilized to reach decision makers involved in Superfund sites including:

- SITE brochures, publications, reports, videos and fact sheets;
- Pre-proposal conferences on SITE solicitations;
- Public meetings and on-site visitors' days;
- Seminar series;
- SITE exhibit displayed at nationwide conferences;
- Innovative technologies program exhibition; and
- Networking through forums, professional associations, centers of excellence, regions, and states.

ATTIC



The Alternative Treatment Technology Information Center (ATTIC) is an information retrieval network that can provide up-to-date technical information on innovative treatment methods for hazardous wastes. Information available through the ATTIC database includes abstracts and executive summaries from over 1200 technical documents and reports. These abstracts and summaries, delineated by technology, are categorized into five groups: (1) Thermal Treatment; (2) Biological Treatment; (3) Solidification/Stablilzation Processes; (4) Chemical Treatment; and (5) Physical Treatment. The Attic Database provides the user with access to innovative technology demonstration studies, a variety of treatability, cost analysis models, migration and sampling databases, underground storage tank case histories and remediation ideas. The ATTIC network can also enable access to expert assistance, a calender of events, and a list of publications.

ATTIC can be accessed through an online system, a system operator or through a disk-based version. For assistance and/or information call the ATTIC operator at 301-816-9135.

SITE PROGRAM CONTACTS

REGION	NAME	REGION	NAME
	Regional Contacts:		
1	Dana King FTS 835-1556 617-573-1556	6	Don Williams FTS 255-2197 214/655-2197
2	Peter Moss FTS 264-4703 212-264-4703	7	Dana Trugley FTS 276-7705 913-551-7705
3	Paul Leonard FTS 597-8485 215/597-8485	8	Gerald Snyder FTS 330-7504 303/294-7504
4	John Risher FTS 347-1586 404/347-1586	9	John Blevins FTS 484-2241 415-744-2241
5	Steve Ostrodka FTS 886-3011 312-886-3011	10	John Barich FTS 399-8562 206-553-8562
	Headquarters Contacts:		
OSWER /TIO	John Quander FTS 382-4362 202-382-4362	ORD/ OEETD	Richard Nalesnik FTS 382-2583 202-382-2583
	ORD/RREL Contacts:		
Demo Program	John Martin FTS 684-7758 513-569-7758	Emerging Program	Norma Lewis FTS 684-7665 513-569-7665

SITE DEMONSTRATION PROGRAM ACCOMPLISHMENTS

The Agency has successfully completed 19 field demonstrations at Superfund sites as indicated in Table 1. SITE demonstration project results may be obtained by contacting the EPA Center for Environmental Research Information (CERI) at (513) 569-7562 or FTS 684-7562.

Table 1

Completed Field Demonstrations

REGION	SITE/ DEVELOPER	DESCRIPTION	PROJECT MANAGER
I	Groveland Wells, MA; Terra Vac. Inc.	In-Situ vacuum extraction of VOCs in soil	Mary Stinson FTS: 340-6683 201-321-6683
II	New Bedford Harbor, MA; CF Systems Corp.	Solvent Extraction to Remove PCBs from sediments	Laurel Staley FTS: 684-7863 513-569-7863
	Imperial Oil, NJ; Soliditech, Inc.	Solidification/ stabilzation of heavy metals and organics	Walter Grube FTS: 684-7798 513-569-7798
III	Douglassville, PA; Hazcon, Inc. (IM-TECH)	Solidification/ stabilization of volatile and semi-volatiles, organics, PCBs, and heavy metals	Paul dePercin FTS: 684-7797 513-569-7797
	Palmerton, PA; E.I. DuPont DeNemours & Co.	Membrane Microfiltration	John Martin FTS: 684-7758 513-569-7758
IV	G.E. Hialeah, FL; International Waste Technology	In-situ solidification of PCBs	Mary Stinson FTS: 340-6683 201-321-6683
	Peak Oil, FL; Shirco Infrared System, Inc.	Transportable IR thermal processing systems for treatment of PCBs, organics, lead, and other metals in soil and sludge material	Howard Wall FTS: 684-7691 513-569-7691
	Risk Reduction Engineering Lab, Cincinnati, OH (Kentucky and Georgia locations)	Debris Washing System	Michael Taylor 513-782-4801
V	Rose Township, MI; Shirco IR Systems, Inc.	Infrared Incinerator System	Howard Wall FTS: 684-7691 513-569-7691
	McGillis & Gibbs, MN; Biotrol	Soilwashing	Mary Stinson FTS: 340-6683 201-321-6683
	McGillis & Gibbs, MN; Biotrol	Biotreatment of groundwater	Mary Stinson FTS: 340-6683 201-321-6683
VI	EPA's Combustion Research Facility, AR; American Combustion Technologies, Inc.	Pyretron oxygen and airburner for use with a rotary kiln incinerator	Laurel Staley FTS: 684-7863 513-569-7863
IX	Lorentz Barrel and Drum, CA; Ultrox International, Inc.	UV/ozone oxidation of orgaincs in groundwater	Norma Lewis FTS: 684-7665 513-569-7665
	McColl Site Fullerton, CA; Excavation Techniques	Excavation & Foam Suppression of Volatiles	Jack Hubbard FTS: 684-7507 513-569-7507
	Lockheed Site Burbank, CA; AWD Technologies, Inc.	Integrated In-Situ Vapor Extraction & Steam Vacuum Stripping Process	Norma Lewis FTS: 684-7665 Gordon Evans FTS: 684-7684
	McColl Site, CA; Ogden Environmental Services	Circulating fluidized bed combustor	Joseph McSorely FTS: 629-2920 919-541-2920
	Annex Terminal, San Pedro, CA; Toxic Treatments, Inc.	In-situ steam - airstripping of volatile organics in soil	Paul DePercin FTS: 684-7797 513-569-7797
	Selma Site, Fresno, CA; Silicate Technology Corp.	Silicate Compounds by Solidification/ Stabilization	Edward Bates FTS: 684-7774 513-569-7774
X	Portable Equipment Company, OR; Chemfix Technologies, Inc.	Chemical fixation/ stabilization of organics and inorganics in waste slurries	Ed Barth FTS: 684-7669 513-569-7669

SITE PROGRAM DOCUMENTS

The following SITE demonstration project publications are available from EPA. Indicate your choice by checking the appropriate box(es) on the order form below. The form may be copied.*

General Publications

- ☐ Technology Profiles (EPA/540/5-90/006)

Project Results

American Combustion - Oxygen Enhanced Incineration
- ☐ Technology Evaluation (EPA/540/5-89/008)
- ☐ Applications Analysis (EPA/540/A5-89/008)

CF Systems Corp. - Solvent Extraction
- ☐ Technology Evaluation (EPA/540/5-90/002)
- ☐ Applications Analysis (EPA/540/A5-90/002)

Chemfix Technologies, Inc. - Chemical Fixation/Stabilization
- ☐ Technology Evaluation (EPA/540/5-89/011)
- ☐ Applications Analysis (EPA/540/A5-89/011)

Hazcon - Solidification
- ☐ Technology Evaluation (EPA/540/5-89/001a)
- ☐ Applications Analysis (EPA/540/A5-89/001)

IWT In-Situ Stabilization
- ☐ Technology Evaluation (EPA/540/5-89/004a)
- ☐ Applications Analysis (EPA/540/A5-89/004)

Shirco-Infrared Incineration
- ☐ Technology Evaluation - Peak Oil (EPA/540/5-88/002a)
- ☐ Technology Evaluation - Rose Township (EPA/540/5-89/007a)
- ☐ Applications Analysis (EPA/540/A5-89/007)

Soliditech, Inc. - Solidification
- ☐ Technology Evaluation (EPA/540/5-89/005a)
- ☐ Applications Analysis (EPA/540/A5-90/005)

Terra Vac - Vacuum Extraction
- ☐ Technology Evaluation (EPA/540/5-89/003a)
- ☐ Applications Analysis (EPA/540/A5-89/003)

Ultrox International - Ultraviolet Ozone Treatment for Liquids
- ☐ Technology Evaluation (EPA/540/5-89/012)
- ☐ Applications Analysis (EPA/540/A5-89/012)

☐ Check here if you would like your name placed on the SITE mailing list

Your Name and Mailing Address (please print)

MAIL TO: **ORD Publications**
26 W. Martin Luther King Drive (G72),
Cincinnati, Ohio 45268

* Documents ordered through ORD Publications are free of charge.

SITE VIDEOCASSETTES

SITE Program videos are also available on selected sites for a small fee. These videos contain footage of actual field demonstration activities, including Visitor Day programs. For further information contact Marilyn Avery, Foster Wheeler Enviresponse, Inc., 8 Peach Tree Hill Rd., Livingston, N.J. 07039, Phone: 908-906-6860.

APPENDIX B

DESCRIPTIONS OF VISITT SUBMENU ITEMS

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Submenu Selection	Description
Business Size	Refers to a vendor's business size as designated by SIC Code. *Small Business.* **Small business** - means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding on government contracts, and qualified as a small business under the criteria and size standards in 13 CFR Part 121. Such a concern is "not dominant in its field of operation" when it does not exercise a controlling or major influence on a national basis in a kind of business activity in which a number of business concerns are primarily engaged. In determining whether dominance exists, consideration shall be given to all appropriate factors, including volume of business, number of employees, financial resources, competitive status or position, ownership or control of materials, processes, patents, license agreements, facilities, sales territory, and nature of business activity. This category also includes those vendors who designate themselves as small disadvantaged/minority business concern or women owned. **Small disadvantaged/minority business concern** - means a small business concern that is at least 51 percent unconditionally owned by one or more individuals who are both socially and economically disadvantaged, or a publicly owned business that has at least 51 percent of its stock unconditionally owned by one or more socially and economically disadvantaged individuals and that has its management and daily business controlled by one or more such individuals. This term also means a small business concern that is at least 51 percent unconditionally owned by an economically disadvantaged Indian tribe or Native Hawaiian Organization, or a publicly owned business that has at least 51 percent of its stock unconditionally owned by one of these entities, that has its management and daily business controlled by members of an economically disadvantaged Indian tribe or Native Hawaiian Organization, and that meets the requirements of 13 CFR 124. **Women-owned** - as used in this form, means a business that is at least 51 percent owned by a woman or women who are U.S. citizens and who also control and operate the business. *Mid-size or Large business.* **Mid-size or large business** - Those vendors who do not qualify as a small business, a small disadvantaged/ minority business, or a women-owned business.
Cleanup Type	Refers to the application type, such as full-scale cleanup or research and field demonstration, or the Federal or state program under which the cleanup took place, such as the EPA SITE Demonstration Program.

Submenu Selection	Description
Contaminant Data	Refers to an actual hazardous substance or contaminant that has been treated by an innovative technology in the database. Vendors have provided in the VISITT database documented examples of specific contaminants treated by their technologies. These contaminants make up the list of approximately 250 hazardous substances or contaminants available for access by the Contaminant Data submenu option.
Contaminant Group	Describes groups of contaminants that have similar chemical and physical properties. Contaminants in the same group are often amenable to the same types of treatment. To the right of each contaminant group listed below is the letter that provides a cross-reference between the group and the list of specific contaminants in Appendix C. **ORGANICS** (A) Halogenated volatiles (B) Halogenated semivolatiles (C) Nonhalogenated volatiles (D) Nonhalogenated semivolatiles (E) Organic pesticides/herbicides (F) Dioxans/furans (G) PCBs (H) Polynuclear aromatics (PNAs) (I) Solvents (J) Benzene-toluene-ethylbenzene-xylene (BTEX) (K) Organic cyanide (L) Organic corrosives **INORGANICS** (M) Heavy metals (N) Nonmetallic toxic elements (As, F) (O) Radioactive metals (P) Asbestos (Q) Inorganic cyanides (R) Inorganic corrosives **Miscellaneous** (S) Explosives/propellants (T) Organometallic pesticides & herbicides
Country	Indicates the vendor(s) or site(s) located in a particular country.
Equipment Scale	Refers to the size of the equipment used for the projects at the site. *Bench-Scale*. Project used bench-top equipment typically in the laboratory. The data from the project may be used to develop a pilot-scale system for future applications. *Pilot-Scale*. Equipment used for the project was of sufficient size to verify the feasibility of the technology and establish the design and operating conditions for the full-scale system. *Full-Scale*. The project utilized equipment capable of remediating an entire site and most likely presents information from an actual site remediation. In some cases, full-scale equipment may be used at a site; however, the entire site may not have been remediated under that project.

Submenu Selection	Description
Media	Refers to the actual or potential types of waste matrices treated: soil (in situ), soil (ex situ), sludge, solid, natural sediment (in situ), natural sediment (ex situ), ground water (in situ), off-gas from a primary treatment technology, dense non-aqueous phase liquid (DNAPL), and light non-aqueous phase liquid (LNAPL). **Example:** The vendor indicated that its technology treats one or more of these media. By selecting this search criterion and specifying one or more of the matrices listed on the look-up table, you can retrieve information about the technologies that treat the matrix or matrices.
Regulation/Statute/ Organization	Refers to the Federal regulation or statute that was applicable at the project site where the vendor applied its technology. This submenu also includes other Federal organizations, such as the Department of Defense or the Department of Energy, which may have also had jurisdiction at the project site. A state category is included for those sites at which state regulations were applicable and for which the state was the lead agency.
Scale	Refers to the development status of an innovative treatment technology: *Bench Scale*. A technology shown to be feasible with bench-top equipment in the laboratory, but available data cannot be used to develop a full-scale system in the absence of additional pilot-scale or full-scale experience for similar applications. *Pilot Scale*. Available equipment is of sufficient size to verify the feasibility of the technology and to establish the design and operating conditions for the full-scale system. *Full Scale*. Available equipment is sized and commercially available for actual site remediation. **Example:** If you are interested in only those technologies that are available at full scale for the type of contaminant treatment you are interested in, use the "Scale" search criteria to focus the list of the technologies you obtain from your search.
Site Name	Listing of locations or facilities at which a vendor is planning to use, is using, or has used its technology. **Example:** Use this search criterion if you know the name of a particular site or facility and want to know if a vendor in the system listed that site or facility under project experience.
State/Province	Listing of sites referred to by vendors, indexed by state name or province. Listing of vendors referenced by state or province. **Example:** Allows a search for all the sites in a specific state or province that are included in VISITT, or finds a site if the location is known but the name of the site is not known. Also allows a search for all vendors by state or province.

Submenu Selection	Description
Technology Type	The term used to describe the types of treatment technologies eligible for VISITT. Appendix C of this manual provides definitions of the following VISITT technology types: • **Acid Extraction** • **Adsorption/Absorption - In Situ** • **Air Sparging -** In Situ Ground Water • **Bioremediation:** In Situ Ground Water, In Situ Lagoon, In Situ Soil, Slurry Phase, Solid Phase, Not Otherwise Specified • **Bioventing** • **Chemical Treatment:** Dechlorination, In Situ Ground Water, Other, Oxidation/Reduction • **Delivery/Extraction Systems** • **Dual-phase Extraction** • **Electrical Separation** • **Magnetic Separation** • **Materials Handling/ Physical Separation** • **Off-Gas Treatment** • **Pneumatic Fracturing** • **Pyrolysis** • **Slagging** • **Soil Flushing - In Situ** • **Soil Vapor Extraction** • **Soil Washing** • **Solvent Extraction** • **Thermal Desorption** • **Thermally Enhanced Recovery - In Situ** • **Vitrification**
Trade Name	A trade name is the particular commercial name assigned by the vendor to an innovative treatment technology. Trade names are different from the names for technology types that EPA has used to group similar technologies. Trade names may also be trademarks. **Example:** Use this search criterion when you know the vendor's trade name for the technology but do not know the company name or technology type used by EPA for VISITT.
Vendor Name	Refers to the commercial enterprise that has developed or purveys an innovative treatment technology. **Example:** Use this search criterion when you know the name of a specific vendor and want to find information on that vendor, such as the technologies and scale of development in which the vendor is engaged or the sites at which the vendor has applied the technology.

Submenu Selection	Description
Waste Source	Refers to the general sources or types of industrial waste or contaminated sites that an innovative technology contained in the VISITT database potentially could address or actually has addressed. Waste sources in VISITT are listed below: Agriculture Battery recycling/disposal Chloro-alkali manufacture Coal gasification Dry cleaners Electroplating Gasoline station/petroleum storage facility Herbicide manufacture/use Industrial landfills Inorganic/organic pigments Machine shops Metal ore mining/smelting Municipal landfills Munitions manufacturing Other inorganic chemical manufacturing Other organic chemical manufacturing Paint/ink formulation Pesticide manufacturing/use Petroleum refining/reuse Photographic products Plastics manufacturing Pulp and paper industry Rubber manufacturing Semiconductor manufacturing Uranium mining Wood preserving

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APPENDIX C

CATEGORIES AND DEFINITIONS OF TECHNOLOGIES FEATURED IN VISITT

Technology Category	Technology Definition
ACID EXTRACTION	This technology is used to remove hazardous metals from excavated soils and sludges through the application of an acidic solution. It is a liquid-solid extraction technology that operates on the principle that the metals of concern will be preferentially solubilized and thereby removed from the waste. Further treatment of the metal-containing acid solution will be required.
ADSORPTION/ ABSORPTION IN-SITU	In this technology, containerized adsorptive/absorptive materials (for example, various organic polymers, activated carbon, and sponge material) are placed directly in ground water to remove various hazardous compounds. This technology category also would include systems in which wells are drilled and adsorptive/absorptive materials are placed in the air space above the ground water, to achieve reductions of relatively volatile compounds. The use of this technology will depend to a large extent on site-specific soil and ground water characteristics.
AIR SPARGING - IN SITU GROUND WATER	This technology reduces concentrations of hazardous compounds in ground water by injecting air below the water table. The injected air creates air bubbles in the ground water. The air bubbles contact dissolved/adsorbed-phase contaminants and non-aqueous phase liquids (NAPL) in the aquifer, causing contaminants to volatilize. The volatilized contaminants are transported by the air bubbles into the vadose zone. Removal of the contaminants transferred to the vadose zone would be accomplished by another technology, usually soil vapor extraction. The application and effectiveness of this technology will depend to a large extent on site-specific soil and ground water conditions.
BIOREMEDIATION - NOT OTHERWISE SPECIFIED	This technology uses microorganisms to degrade organic contaminants. The microorganisms break down the organic contaminants by using them as a food source. End products of the degradation typically are CO_2 and H_2O. Nutrients, such as phosphorous, nitrogen, or oxygen, may be added to enhance the biodegradation process. The VISITT database identifies five subcategories of this technology, based on the type of application and medium treated. The technologies listed in this category are those that did not specify one of the processes listed in the subcategories or that were not described in enough detail to be included into one of the five subcategories.
BIOREMEDIATION - IN SITU GROUND WATER	The defining characteristic of this technology is an injection system (typically injection wells) to circulate microorganisms, nutrients, and oxygen through contaminated aquifers. In most instances, ground water is pumped, treated to some extent, and then reinjected with additives that enhance biodegradation. Common system design consists of a central withdrawal of ground water and reinfiltration upgradient of the treated area. Biodegradation relies on contact between contaminants in the ground water and microorganisms.
BIOREMEDIATION - IN SITU LAGOON	This technology is similar to Bioremediation - Slurry Phase. However, it is applied in situ. The target medium has a considerably higher moisture content and may be close to a slurry in consistency. The various microbes and nutrients may be added by injection, sprayed on top of the lagoon, and mixed, or applied in another manner. In many situations, the medium also may be stirred or aerated to promote bioremediation. Applications for this technology would include hazardous waste sludge lagoons.
BIOREMEDIATION - IN SITU SOIL	The target media for this technology are subsurface soils and the vadose zone above the water table. In this technology, various microbes, nutrients, and an oxygen source are injected through injection wells into the soil. In general, subsurface soil moisture is required, and soils must be relatively permeable.

Technology Category	Technology Definition
BIOREMEDIATION - SLURRY PHASE	This technology mixes excavated soil, sludge, or sediment with water to form a slurry that is mechanically agitated in an environment (usually a tank or reactor vessel, although lagoon applications are possible) with appropriate ambient conditions of nutrients, oxygen, pH, and temperature. Upon completion of the process, the slurry is dewatered and the treated material disposed.
BIOREMEDIATION - SOLID PHASE	In this system, excavated soils are placed in a building or on a lined treatment bed. To facilitate microbial growth, nutrients and other additives are tilled into the soil with conventional equipment. The tillage equipment may provide aeration for the soil as well. Water is provided by a sprayer or sprinkler system. The VISITT system includes composting and land treatment in this category.
BIOVENTING	This technology combines soil vapor extraction with bioremediation. It involves a system of vapor extraction wells that induce air flow in the subsurface through air injection and/or through the use of a vacuum. The air flow increases the amount of oxygen available for microbial degradation. The rate of air flow is typically less than it would be with soil vapor extraction alone. The air flow is reduced to enhance bioremediation of volatile compounds, while decreasing their extraction. A nutrient solution may be injected with the air or percolated into the soil to enhance biodegradation.
CHEMICAL TREATMENT - DECHLORINATION	This category includes any chemical treatment technology that results in the removal or replacement of chlorine atoms bonded to hazardous compounds to produce less toxic compounds.
CHEMICAL TREATMENT - IN SITU GROUND WATER	This technology treats ground water in situ through chemical treatment technology. In this technology, chemicals may be injected into the ground water to convert hazardous compounds to less hazardous compounds. This technology differs from conventional pump-and-treat technologies in that the ground water is treated in situ; it is not pumped above ground, treated, and then reinjected.
CHEMICAL TREATMENT - OTHER	Hazardous compounds are converted to less hazardous or nonhazardous compounds through chemical reactions that are typically not classified as oxidation or reduction reactions. Chemical reactions in this category include chelation acidifications and ion exchange reactions.
CHEMICAL TREATMENT - OXIDATION/ REDUCTION	Hazardous compounds are converted to less hazardous or nonhazardous compounds through chemical reactions that either oxidize or reduce the compounds. The chemical reactions may be induced through the addition of other compounds or through exposure of the contaminant to light (photo-initiated reactions). Treatment technologies that fall under this classification operate at moderate temperatures and pressures.
DELIVERY/ EXTRACTION SYSTEMS	These technologies do not treat hazardous wastes directly but facilitate the use of other waste treatment technologies. Such technologies may provide a means of in situ treatment in cases in which such treatment previously was not feasible. In VISITT, such technologies include horizontal wells and hollow-stem augers. In cases in which the delivery and extraction technology is linked integrally to the use of a particular treatment, the technology has been placed in the same category as the technology to which it is linked.
DUAL-PHASE EXTRACTION	This technology extracts contaminants simultaneously from both the saturated and the unsaturated zone soils in situ. It usually is applied in tandem with a soil vapor extraction system. These new technologies apply soil vapor extraction techniques to contaminants trapped in saturated zone soils, which are more difficult to treat than are those in the unsaturated zone. In some instances, this result may be achieved by sparging the section of a well that penetrates the ground water table. Other methods also may be employed.

Technology Category	Technology Definition
ELECTRICAL SEPARATION	The operating principle of this technology is the establishment of an electric field that will allow positive and negative ions to migrate through the contaminated material, thereby removing the contaminants. The effectiveness of this technology will depend to a great extent on the electrolytic nature of the waste.
ELECTRO-THERMAL GASIFICATION	This process entails the use of electrode placed in the subsurface to which an electric current is applied. The electrical current heats the subsurface causing contaminants to volatilize. The contaminants can then be extracted through soil vapor extraction wells or combusted in situ by increasing the energy applied to the subsurface.
MAGNETIC SEPARATION	This technology separates and concentrates contaminants or particles based on their magnetic susceptibility. A magnetic field or energy gradient is applied to a matrix or waste stream. The magnetic field or gradient deflects the magnetically susceptible particles and thereby separates them from nonmagnetic particles.
MATERIALS HANDLING/PHYSICAL SEPARATION	These technologies do not treat hazardous waste directly but facilitate the use of other hazardous waste treatment technologies or separate the waste into phases, making further treatment easier. In VISITT, such technologies include innovative technologies to dewater waste, separate phases, and to remove debris. In cases in which material handling/physical separation technology is linked integrally to the use of a particular treatment (for example, a specialized reactor for bioremediation), the technology also has been placed in the same technology category as the technology to which it is linked.
OFF-GAS TREATMENT	This technology is specifically designed to treat the off-gas generated by another treatment technology, such as thermal desorption or soil vapor extraction. Treatment of the gases may involve a chemical reaction to convert the gases to less hazardous compounds. Other treatments may involve a physical process such as absorption of the gases onto a substrate, where they can be treated further.
PNEUMATIC FRACTURING	This technology uses air or gas under high pressure to create fractures or openings in areas of low permeability in the subsurface. The high pressure gas usually is applied through injection or extraction wells. The purpose of the technology is to increase permeability in areas of low permeability so that contaminants can be treated or extracted more easily by another technology. The technology often is used with soil vapor extraction to extract contaminants from low permeability regions.
PYROLYSIS	This technology, also referred to as thermal decomposition, breaks down large hydrocarbon molecules into molecules having lower molecular weight. This result is achieved in the absence of oxygen (that is, no oxidation) by high temperature alone. The process can take place in a moving-bed or fluidized-bed reactor. The products of the process include low-molecular-weight hydrocarbons and stack gases. Catalysts may be used to promote the pyrolysis process. Some pyrolysis systems may require air emission control systems for gases generated.
SLAGGING	This technology applies to hazardous wastes that contain substantial concentrations of metals (approximately 5 percent or greater). This system operates in a high-temperature environment of 3,900°F (2,150°C) or higher. The conditions may be oxidizing or reducing. In the high temperature environment, such metals as zinc, lead, and cadmium may be vaporized, along with other volatile compounds, such as halides, while less volatile metals such as copper or nickel coalesce into a molten alloy. The remaining components, such as metal oxides, melt into a molten slag. Some slagging systems may require air emission control systems for acid gas, metal vapors, and particulate.

Technology Category	Technology Definition
SOIL FLUSHING - IN SITU	This technology consists of circulating substantial volumes of water through a contaminated area to flush hazardous waste compounds from the contaminated site. Water is introduced into the soil through injection wells, trenches, or sprinklers. The water circulates through the contaminated soil and is extracted through extraction wells or by other means. The principal defining characteristic of this technology is its ability to essentially isolate the injected water from any aquifer, and then to recover the water for aboveground treatment. The treated water is recycled through the contaminated area. Treatment chemicals may be added to the water to help remove the hazardous constituents of concern (for example, water can be slightly acidified to help flush toxic metals from the waste site). As is the case with air sparging in situ ground water, the use of this technology depends to a great extent on site-specific soil and ground water conditions.
SOIL VAPOR EXTRACTION	This technology typically strips volatile organic compounds from the soil by applying a vacuum to a series of extraction wells to create an air flow through the vadose zone. Air also may be injected through injection wells to enhance air flow. As air moves through the soil, volatile contaminants move from the soil and pore-space water to the air. The contaminated air often is withdrawn with entrained water. Further treatment of the extracted vapors usually is required.
SOIL WASHING	This ex situ technology uses water and mechanical action to remove hazardous constituents that adhere physically to soil particles. It makes use of the fact that contaminants have a tendency to adhere to the organic carbon and fine-grained soil fraction (silt and clay), as opposed to the coarse grain mineral fraction (sand and gravel). Surficial contamination is removed from the coarse fraction of the soils by abrasive scouring. The wash water may be augmented with a leaching agent, surfactant, pH adjustment, or chelating agent to help remove organics or heavy metals. The spent wash water requires further treatment, after which it usually is recycled back to the treatment unit.
SOLVENT EXTRACTION	Similar to acid extraction, this technology focuses on the removal of organic compounds from contaminated material rather than on the removal of metals. This is an ex situ liquid-solid and liquid-liquid extraction process that operates on the principle that the organic constituents of concern can be removed preferentially from the waste to the solvent phase. The solvent used can be varied, depending on the organic compounds to be treated. As is the case in acid extraction, the contaminated solvent solution requires further treatment.
THERMAL DESORPTION	This technology uses heat in a controlled environment ex situ to cause various organic compounds to volatilize and thereby be removed from contaminated material. In some cases, an inert gas is used to carry the desorbed organics. The processes are designed to avoid combustion in the primary unit. The temperature range for this technology is lower than incineration, usually 300°F - 1200°F (150°C - 650°C). Higher temperatures may be used when there is no oxygen present in the desorption chamber. Constituents that are volatilized typically require further control for off-gases. Typical off-gas systems may condense and recover volatilized constituents, absorb off-gas with carbon, or use a nonflame, low-temperature catalytic destruction process.

Technology Category	Technology Definition
THERMALLY ENHANCED RECOVERY- IN SITU	This technology typically uses heat to volatilize contaminants in soil. Once volatilized, the contaminants can be extracted or treated in situ. Some systems inject hot air or steam directly into the soil to induce vaporization of various volatile and semivolatile organic compounds. Injection of the hot air or steam may occur either through injection wells or by other devices such as hollow-stem augers. In other cases, the heat may be generated by means other than steam, such as electric current or heating by radio frequency. The vaporized compounds are extracted directly from the soil through the use of vapor extraction wells. The hot air or steam (thermal treatment) enhances volatilization of the contaminant, thus increasing removal rates and facilitating the volatilization of less volatile compounds that would not have been extracted with such nonthermal treatments such as soil vapor extraction. Further treatment of the extracted vapors usually is required.
VITRIFICATION	This technology treats wastes containing primarily metals and high concentrations of silicates (soil-like material). This technology uses heat, usually applied through electrical power, to melt contaminated soils and sludges to form a stable glass and crystalline structure having very low leaching characteristics. The contaminated waste typically is heated to a range of 2,900°F to 3,600°F (1,600°C to 2,000°C), well above the soil's melting point. In some cases, vitrifying agents may be added. Metals are encapsulated in the glass-like structure of the melted silicate compounds, and most organic compounds are destroyed. Constituents that are volatilized will require further control.

APPENDIX D

LIST OF CONTAMINANT GROUP CODES FOR HAZARDOUS SUBSTANCES

LIST OF CONTAMINANT GROUP CODES FOR HAZARDOUS SUBSTANCES

Organic

- A Halogenated volatiles
- B Halogenated semivolatiles
- C Nonhalogenated volatiles
- D Nonhalogenated semivolatiles
- E Organic pesticides/herbicides
- F Dioxins/furans
- G PCBs
- H Polynuclear aromatics (PNAs)
- I Solvents
- J Benzene-toluene-ethylbenzene-xylene (BTEX)
- K Organic cyanide
- L Organic corrosives

Inorganic

- M Heavy metals
- N Nonmetallic toxic elements (As, F)
- O Radioactive metals
- P Asbestos
- Q Inorganic cyanides
- R Inorganic corrosives

Miscellaneous

- S Explosives/propellants
- T Organometallic pesticides/herbicides
- U Organometallic compounds

Organic Contaminant Group

CAS No.		
208968	Acenaphthylene	D,H
83329	Acenaphthene	D,H
75070	Acetaldehyde	C
67641	Acetone	C,I
75058	Acetonitrile	C,K
98862	Acetophenone	D
591082	Acetyl-2-thiourea, 1	D
107028	Acrolein	C
79061	Acrylamide	D
79107	Acrylic acid	CL
107131	Acrylonitrile	C
124049	Adipic acid	L
116063	Aldicarb	E
309002	Aldrin	E
107186	Allyl alcohol	E
62533	Aniline	D,I,L
120127	Anthracene	D,H
1912249	Atrazine	E
2642719	Azinphos-ethyl	E
86500	Azinphos-methyl	E
151564	Aziridine	C
71432	Benzene	C,I,J
98884	Benzene carbonyl chloride	B
92875	Benzidine	D
205992	Benzofluoranthene,3,4-	H
65850	Benzoic acid	D,L
100470	Benzonitrile	A,C,I
95169	Benzothiazole,1,2-	D,I
50328	Benzo (a) pyrene	D,H
206440	Benzo (j,k) fluorene	H
207089	Benzo (k) fluoranthene	D,H
100447	Benzyl chloride	A
56553	Benz (a) anthracene	D,H
117817	Bis (2-ethyl hexyl) phthalate	D
111911	Bis (2-chloroethoxy) methane	B
111444	Bis (2-chloroethyl) ether	B
542881	Bis (chloromethyl) ether	B
75274	Bromodichloromethane	A
74964	Bromomethane	A
1689845	Bromoxynil	E
106990	Butadiene, 1,3-	C
71363	Butanol	C
85687	Butlbenzyl phthalate	D
94826	Butyric acid, 4-2(2,4-dichlorop)	C,L

CAS No.		
133062	Captan	B
63252	Carbaryl	E
1563662	Carbofuran	E,F
75150	Carbon disulfide	C
56235	Carbon tetrachloride	A
78196	Carbophenothion	E
75876	Chloral	A
57749	Chlordane	E
106478	Chloroaniline, p-	B
108907	Chlorobenzene	A
67663	Chloroform	A
74873	Chloromethane	A
107302	Chloromethyl methyl ether	A
106898	Chloromethyloxirane, 2-	E
91587	Chloronaphthalene, 2-	B
95578	Chlorophenol, 2-	B
59507	Chloro-3-methylphenol, 4-	B
2921882	Chloropyrifos	E
218019	Chrysene	D,H
56724	Coumaphos	E
8021394	Creosote	H
108394	Cresol, m-	D
106445	Cresol, p-	D
98828	Cumene	C,I
21725462	Cyanazine	E
110827	Cyclohexane	C,I
108941	Cyclohexanone	C
72548	DDD	E
72559	DDE	E
50293	DDT	E
78488	DEF	C,E
333415	Diazinon	E
132649	Dibenzofuran	D
53703	Dibenz (a,h) anthracene	D,H
124481	Dibromachloromethane	A
106934	Dibromoethane, 1,2-	A
96128	Dibromo-3-chloropropane, 1,2-	A
1918009	Dicamba	E
95501	Dichlorobenzene, 1,2-	B
541731	Dichlorobenzene, 1,3-	B
106467	Dichlorobenzene, 1,4-	B
91941	Dichlorobenzidine, 3,3-	B
75718	Dichlorodifluoromethane	A
75343	Dichloroethane, 1,1-	A
107062	Dichloroethane, 1,2-	A

Organic Contaminant Group (continued)

CAS No.		
75354	Dichloroethene, 1,1-	A
156592	Dichloroethylene, cis-1,2-	A
156605	Dichloroethylene, trans-1,2-	A
120832	Dichlorophenol, 2,4-	B
94757	Dichlorophenoxyacetic acid, 2-	L
78875	Dichloropropane, 1,2-	A
542756	Dichloropropene, 1,3-	A
62737	Dichlorvos	E
115322	Dicofol	E
60571	Dieldrin	E
84662	Diethyl phthalate	D
111466	Diethylene glycol	D,I
1660942	Diisopropylmethylphosphonate	D
60515	Dimethoate	E
119904	Dimethoxybenzidine, 3,3-	D
105679	Dimethyl phenol, 2,4-	D
13113	Dimethyl phthalate	D
77781	Dimethyl sulfate	C
99650	Dinitrobenzene, 1,3-	D
51285	Dinitrophenol, 2,4-	D
121142	Dinitrotoluene, 2,4-	D
606202	Dinitrotoluene, 2,6-	D
88857	Dinoseb	E
123911	Dioxane, 1,4	C
78342	Dioxathion	E
122667	Diphenylhydrazine, 1,2-	D,H
85007	Diquat	E
298044	Disulfoton	C,E
330541	Diuron	E
84742	Di-n-butyl phthalate	D
117840	Di-n-octyl phthalate	D
115297	Endosulfan	E
959988	Endosulfan	I
33212659	Endosulfan II	E
1031078	Endolsulfan sulfate	E
145733	Endothall	E
72208	Endrin	E
7421934	Endrin aldehyde	E
563122	Ethion	E
141786	Ethyl acetate	C
100414	Ethyl benzene	C,J
75003	Ethyl chloride	A,I
60297	Ethyl ether	C
107211	Ethylene glycol	I
110805	Ethylene glycol monoethyl ether	C,I
759944	Ethylpropylthio carbomate, S-	E

CAS No.		
122145	Fenitrothion	E
86737	Fluorene	D,H
50000	Formaldehyde	C
64186	Formic acid	L
110009	Furan	F
98011	Furfural	I,C
765344	Glycidyaldehyde	G
76448	Heptachlor	E
1024573	Heptachlor epoxide	E
118741	Hexachlorobenzene	B
87683	Hexachlorobutadieene	B
60873	Hexachlorocyclohexane, alpha-	E
60873	Hexachlorocyclohexane, beta-	E
60873	Hexachlorocyclohexane, delta-	E
77474	Hexachlorocyclopentadiene	B
67721	Hexachloroethane	B
70304	Hexachlorophene	B
110543	Hexane	C,I
1689834	Ioxynil	E
78831	Isobutanol	C
78591	Isophorone	D
143500	Kepone	E
58899	Lindane	E
121755	Malathion	C,E
108316	Maleic anhydride	E
123331	Maleric hydrazide	E
126987	Methacrylonitrile	C
67561	Methanol	C
16752775	Methomyl	E
72435	Methoxychlor	E
79221	Methyl chlorocarbonate	L
78933	Methyl ethyl ketone	C
108101	Methyl isobutyl ketone	C,I
80626	Methyl methacrylate	C
101144	Methylene bis (2-chloroaniline)	B
75092	Methylene chloride	A
23855	Mirex	E
91203	Naphthalene	D,H
100016	Nitroaniline, p-	D
98953	Nitrobenzene	D

Organic Contaminant Group (continued)

CAS No.		
100027	Nitrophenol, 4-	D
1116547	Nitrosodiethanolamine, n-	D
55185	Nitrosodiethylamine, n-	D
62759	Nitrosodimethylamine, n-	D
86306	Nitrosodiphenylamine, n-	D
930552	Nitrosopyrrolidine, n-	D
924163	Nitroso-di-n-butylamine, n-	D
615532	Nitroso-di-n-methylurethane, n-	D
99990	Nitrotoluene, 4-	D
56382	Parathion, ethyl-	E
298000	Parathion, methyl-	E
1336363	PCBs	G
608935	Pentachlorobenzene	B
76017	Pentachloroethane	B
82688	Pentachloronitrobenzene	B
87865	Pentachlorophenol	B
85018	Phenanthrene	D,H
108952	Phenol	D
139662	Phenyl sulfide	D
62384	Phenylmercurie acetate	E
298022	Phorate	C,E
75445	Phosgene	E
13171216	Phosphamidon	E
7803512	Phosphine	E
85449	Phthalic anhydride	D,E
23950585	Pronamide	D
129000	Pyrene	D,H
110861	Pyridine	C,I
91225	Quinoline	D,H
108463	Resorcinol	D
299843	Ronnel	E
57249	Strychnine	E,H
100425	Styrene	C
746016	TCDD	F
95943	Tetrachlorobenzene, 1,2,4,5-	B
630206	Tetrachloroethane, 1,1,1,2-	A,E,I
79345	Tetrachloroethane, 1,1,2,2-	A
127184	Tetrachloroethene	A
58902	Tetrachlorophenol, 2,3,4,6	B
3689245	Tetraethyldithiopyrophosphate	E
109999	Tetrahydrofuran	F,I
137268	Thiram	E
108883	Toluene	C,J
584849	Toluene diisocyanate	D
8001352	Toxaphene	E
93721	TP, 2,4,5-	E

CAS No.		
75252	Tribromomethane	A
120821	Trichlorobenzene, 1,2,4-	B
71556	Trichloroethane, 1,1,1-	A
79005	Trichloroethane, 1,1,2-	A
79016	Trichloroethylene	A
75694	Trichlorofluoromethane	A
933788	Trichlorophenol, 2,3,5-	B
95954	Trichlorophenol, 2,4,5-	B
88062	Trichlorophenol, 2,4,6-	B
609198	Trichlorophenol, 3,4,5-	B
93765	Trichlorophenoxyacetic acid, 2-	L
933788	Trichloro-1,2,2-trifluoroethane	A,I
27323417	Triethanolamine	E
126727	Tris (2,3-dibromopropyl) phosphate	B
108054	Vinyl acetate	C
75014	Vinyl chloride	A
81812	Warfarin	E
108383	Xylene, m-	C,J
95476	Xylene, o-	C,J
106423	Xylene, p-	C,J

Inorganic Contaminant Group

CAS No.		
7429905	Aluminum	M
20859738	Aluminum phosphide	M
7440360	Antimony	M
7440382	Arsenic	M
1327533	Arsenic trioxide	M
1303339	Arsenic trisulfide	M
7440393	Barium	M
542621	Barium cyanide	M,Q
7440417	Beryllium	M
7440439	Cadmium	M
13765190	Calcium chromate	M
7778543	Calcium hypochlorite	M
1333820	Chromic acid	M,R
7440473	Chromium	M
	Chromium (III)	M
	Chromium (VI)	M
7440484	Cobalt	M
7440508	Copper	M
544923	Copper cyanide	M,Q,e
7720787	Ferrous sulfate	M
7439896	Iron	M
7439921	Lead	M
7439965	Manganese	M
7439976	Mercury	M
7440020	Nickel	M
7718549	Nickel chloride	M
10102440	Nitrogen dioxide	R
7789006	Potassium chromate	M
151508	Potassium cyanide	M,Q
506616	Potassium silver cyanide	M,Q
7783008	Selenious acid	M,R
7782492	Selenium	M
7440224	Silver	M
506649	Silver cyanide	M,Q
7440235	Sodium	M
26628228	Sodium azide	M
7681494	Sodium fluoride	M
7775113	Sodium chromate	M

CAS No.		
143339	Sodium cyanide	M,Q
1310732	Sodium hydroxide	M,R
7440280	Thallium	M
1314325	Thallic oxide	M
563688	Thallium acetate	M
6533739	Thallium carbonate	M
7791120	Thallium chloride	M
10102451	Thallium nitrate	M
12039520	Thallium selenide	M
7446186	Thallium (I) sulfate	M
7440291	Thorium	M
1314621	Vanadium pentoxide	M
7440666	Zinc	M
557211	Zinc cyanide	M,Q
1314847	Zinc phosphide	M
7733020	Zinc sulfate	M

Explosive/Propellants

CAS No.		
7664417	Ammonia	S
131748	Ammonium picrate	S
7773060	Ammonium sulfamate	S
460195	Cyanogen	S
2691410	Cyclotetramethylenetetranitramine	S
302012	Hydrazine	S
55630	Nitroglycerine	S
99990	Nitrotoluene, 4-	S
26628228	Sodium azide	M,S
99354	Trinitrobenzene, 1,3,5	S
118967	Trinitrotoluene	S

Organometallic Compound

CAS No.		
630104	Selenourea	U
78002	Tetraethyl lead	U

APPENDIX E

VENDOR INFORMATION FORM

VENDOR INFORMATION RECORD

(VISITT)
VENDOR INFORMATION FORM

Please read instructions in Appendix A before proceeding

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW

1. Date Submitted ____/____/____

2a. Developer/Vendor Name _____

2b. Is this an update of a VISITT Version 2.0 technology? Yes ☐ No ☐

If yes, specify technology and vendor name that appear in VISITT 2.0 if different from the information in this update.

_____

For VISITT Version 2.0 Vendors: Questions 2c and 2d are intended to gather information on the use of VISITT in the remediation community.

2c. Please provide a rough estimate of the total number or frequency of inquiries your company has received through your inclusion in VISITT. _____

2d. Has your company performed work (either for a fee or free), such as a treatability study, pilot-scale study, or field demonstration, as a result of those inquiries. ☐ Yes ☐ No

Please provide details, if possible. _____

2e. Please list your primary SIC code(s) and check the appropriate business classification for each code.

SIC Code ____ ☐ Small ☐ Other Than Small ☐ Disadvantaged/Minority ☐ Women-owned
SIC Code ____ ☐ Small ☐ Other Than Small ☐ Disadvantaged/Minority ☐ Women-owned
SIC Code ____ ☐ Small ☐ Other Than Small ☐ Disadvantaged/Minority ☐ Women-owned

3. Street Address _____

4. City _____ State/Province _____ Zip Code _____

5. Country _____

6. a. Contact Name _____

b. Contact Title _____

7. Contact Phone ( )____-____ 8. Fax Number ( )____-____

EPA Form 9210-1 (Rev. 7-93) E-1

Vendor Name _____
Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

9. **Technology Type.*** *Check one only.* Fill out a separate form for each additional technology.

☐ Acid Extraction
☐ Adsorption - In Situ
☐ Air Sparging - In Situ Ground Water
☐ Bioremediation - In Situ Ground Water
☐ Bioremediation - In Situ Lagoon
☐ Bioremediation - In Situ Soil
☐ Bioremediation - Not Otherwise Specified
☐ Bioremediation - Slurry Phase
☐ Bioremediation - Solid Phase
☐ Bioventing
☐ Chemical Treatment - Dechlorination
☐ Chemical Treatment - In Situ Ground Water
☐ Chemical Treatment - Other
☐ Delivery/Extraction Systems
☐ Electrical Separation
☐ Magnetic Separation
☐ Materials Handling/Physical Separation
☐ Off-Gas Treatment
☐ Pneumatic Fracturing
☐ Pyrolysis
☐ Slagging - Off-Gas Treated
☐ Soil Flushing - In Situ
☐ Soil Vapor Extraction
☐ Soil Washing
☐ Soil/Ground Water Multi-Phase Extraction
☐ Solvent Extraction
☐ Thermal Desorption General
☐ Thermal Desorption - Off-Gas Treated
☐ Thermally Enhanced Recovery In Situ
☐ Vitrification - General
☐ Vitrification - Off-Gas Treated
☐ Other (specify) _____

* See Appendix C for definitions of technology types.

10a. **Technology Name Assigned By Vendor** *(if different than name listed in Question 9).*

_____

10b. Registered trademark? ☐ Yes ☐ No

11. Patents

a. Is technology patented? ☐ Yes ☐ No

b. Is patent pending? ☐ Yes ☐ No

12. **Superfund Innovative Technology Evaluation (SITE) Program.**

a. Is this technology being tested, or has this technology been tested, in EPA SITE Emerging Technology Program?

☐ Yes ☐ No

b. Is this technology being tested, or has this technology been tested, in EPA SITE Demonstration Program?

☐ Yes ☐ No

EPA Form 9210-1 (Rev. 7-93) E-2

Vendor Name _____
Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

13. **Description of Technology.** In 300 words or less, describe treatment process, including scientific principle on which the technology is based; key treatment steps; unique and innovative features; whether full-scale system is/will be batch, continuous, or semicontinuous; and whether the technology is above ground or in situ. *Parts 2 and 3* allow more detail for full- and pilot-scale systems. Provide a flow chart of the treatment process, showing the equipment necessary for each step. Flowcharts might not be included in VISITT.

EXAMPLE

Description of Technology

ABC Corporation has developed an innovative solvent extraction technology (SUPER) that uses Super Chemical as the solvent. Super Chemical is a biodegradable solvent.

The key to success of this process is Super Chemical's property of inverse miscibility; below 65 degrees F, Super Chemical is soluble in water (hydrophilic) and above 65 degrees F, it is insoluble in water (hydrophobic). Therefore, cold Super Chemical can extract water and water-soluble compounds, and warm Super Chemical can extract organic contaminants, such as PCBs, pesticides, PAHs, SVOCs, and VOCs.

Within the unit, the soil is washed continuously with Super Chemical in a counter-current process. The contaminants dissolve in the solution and are removed from the soil by the counter-current flow. The contaminated solvents are reclaimed in a closed-loop circuit, eliminating the need for large volumes of solvent. The clean, washed soil is moved to a closed-loop dryer system, where any excess solvent is removed from the soil. When the soil exits the system, it is relatively free of organics and dry. The collected contaminant from the solvent washing is concentrated 1,000 to 10,000 times, reducing its volume and its associated disposal costs, and is pumped periodically from the system into labeled 55-gallon drums for conventional off-site disposal.

Emissions of organic vapors to air are controlled and treated by a carbon absorption system

EPA Form 9210-1 (Rev. 7-93) E-3

Vendor Name _____
Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

13. **Description of Technology** *(continued).*

EPA Form 9210-1 (Rev. 7-93) E-4

Vendor Name _____
Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

14. **Technology Highlights.** In 200 words or less, describe, in terms of contaminants treated, performance, implementation, or cost, the key marketable features of technology, such as treatment niche and advantages over other technologies.

EXAMPLE

Technology Highlights

The SUPER solvent extraction process can treat soils, sludges, and sediments contaminated with PCBs, carcinogenic PAHs, pesticides, and VOCs at 20% to 40% of incineration costs. Treated products from the SUPER process include: water suitable for discharge, oil for recycle as fuel, and solids that can be returned to the site as backfill. The process also can reduce the initial volume of contaminated material by as much as 90%.

The SUPER solvent extraction process operates at near ambient pressures and temperatures, uses off the shelf process equipment, and controls air emissions. The extraction efficiency (organic removal efficiency) achieved is as high as 99%.

Solvent recovery is also greater than 99%. The process can treat up to 300 tons per day of contaminated soil. This technology is well accepted by communities because air emissions are minimized.

EPA Form 9210-1 (Rev. 7-93) E-5

Vendor Name _____
Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

15. **Technical Limitations.** In 200 words or less, describe technical limitations such as specific contaminants or contaminant combinations, temperature, moisture content, or chemical properties of the contaminant, that could adversely affect applicability or performance.

EXAMPLE

Technology Limitations

The SUPER process is not applicable for metal-only, (e.g., radioactive) or other inorganic wastes, but its performance is not affected by inorganics at low concentrations. This process may require screening or crushing to 0.25 inch, and other feed preparation operations, depending on the waste. The extraction efficiency of an organic contaminant will depend on its solubility in the solvent. The solvent used is best suited for PCBs and pesticides.

EPA Form 9210-1 (Rev. 7-93) E-6

Vendor Name _____
Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

16. **Other Comments.** In 200 words or less, provide additional information about the technology, such as its history, status, capabilities, and experience and applicable permits obtained (for example, TSCA or RCRA). Also describe plans for future development of the technology, including diversification of media and/or contaminants treated.

EXAMPLE

Other Comments

The SUPER process has been demonstrated successfully at bench scale, pilot scale, and full scale. A full-scale SUPER unit was used to treat sludges contaminated with PCBs at the BAD Oil Refining Superfund site.

Two pilot-scale units have been built. One was operated under the SITE program to treat soils and sludges contaminated with PCBs.

Bench-scale treatability studies have been conducted on contaminated soils containing petrochemical compounds, pharmaceutical compounds, pesticides, PCBs, and wood preserving wastes containing PAHs.

EPA Form 9210-1 (Rev. 7-93) E-7

Vendor Name _____
Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

17. **Technology Status.** *Check only one.* Using the following definitions, indicate the operational status of the technology.

a. ☐ **Full scale.** Available equipment is sized and commercially available for actual site remediation. (If you select full scale, you must fill out *Part 2*).

b. ☐ **Pilot scale.** Available equipment is of sufficient size to verify technology feasibility or establish the design and operating conditions for a full-scale system. However, it is not of the size typically used for a cleanup. (If you select pilot scale, you must fill out *Part 3*).

c. ☐ **Bench scale or emerging.** Technology has been shown to be feasible through the use of bench-top equipment in the laboratory. Data from these studies cannot be used to scale up the technology to full scale.

18. **Media treated.** Check "actual" for all media that have been treated by your technology. Check "potential" for all media to which technology may be applied in the future.

Actual	Potential	
☐	☐	Soil (in situ)
☐	☐	Soil (ex situ)
☐	☐	Sludge (does not include municipal sewage sludge)
☐	☐	Solid (for example, slag)
☐	☐	Natural sediment (in situ)
☐	☐	Natural sediment (ex situ)
☐	☐	Ground water (in situ) (includes treatment of ground water and/or saturated soil)
☐	☐	Off-gas generated from a primary innovative treatment technology
☐	☐	Dense nonaqueous phase liquids (DNAPL) (in situ)
☐	☐	Light nonaqueous phase liquids (LNAPL) (in situ)

19. **Contaminants and Contaminant Groups Treated.** *Check all that may apply.* Check "actual" for all that have been treated by your technology (that is, data exist). Check "potential" for all that the technology may be applied to in the future. Data for actual contaminants treated should be included in *Part 5* (see Appendix D for key to contaminant groups). If your technology is materials handling/physical separation, delivery/extraction, or if you are an equipment vendor, this question may not apply.

Actual	Potential		Actual	Potential	
☐	☐	Halogenated volatiles	☐	☐	Heavy metals
☐	☐	Halogenated semivolatiles	☐	☐	Nonmetallic toxic elements
☐	☐	Nonhalogenated volatiles	☐	☐	Radioactive metals
☐	☐	Nonhalogenated semivolatiles	☐	☐	Asbestos
☐	☐	Organic pesticides/herbicides	☐	☐	Inorganic cyanides
☐	☐	Dioxins/furans	☐	☐	Inorganic corrosives
☐	☐	PCBs			Miscellaneous
☐	☐	Polynuclear aromatics (PNA)			
☐	☐	Solvents	☐	☐	Explosives/propellants
☐	☐	Benzene-toluene-ethylbenzene-xylene (BTEX)	☐	☐	Organometallic pesticides/herbicides
☐	☐	Acetonitrile (organic cyanide)	☐	☐	Other (specify) _____
☐	☐	Organic acids			

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Vendor Name _____
Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

20. **Industrial Waste Sources or Site Types of Sites Treated.** *Check all that may apply.* Check "actual" for all that have been treated by your technology (that is, data exist). Check "potential" for all that the technology may be applied to in the future. Treatment data should be available for those sites for which "actual" is checked. See Table A for wastes typically associated with each industry.

Actual	Potential		Actual	Potential	
☐	☐	Agriculture	☐	☐	Munitions Manufacturing
☐	☐	Battery recycling/disposal	☐	☐	Paint/ink formulation
☐	☐	Chloro-alkali manufacturing	☐	☐	Pesticide manufacturing/use
☐	☐	Coal gasification	☐	☐	Petroleum refining and reuse
☐	☐	Dry cleaning	☐	☐	Photographic products
☐	☐	Electroplating	☐	☐	Plastics manufacturing
☐	☐	Gasoline service station/petroleum storage facility	☐	☐	Pulp and paper industry
☐	☐	Herbicide manufacturing/use	☐	☐	Other organic chemical manufacturing
☐	☐	Industrial landfills	☐	☐	Other inorganic chemical manufacturing
☐	☐	Inorganic/organic pigments	☐	☐	Semiconductor manufacturing
☐	☐	Machine shops	☐	☐	Rubber manufacturing
☐	☐	Metal ore mining and smelting	☐	☐	Wood preserving
☐	☐	Municipal Landfill	☐	☐	Uranium mining
			☐	☐	Others *(specify)* _____

21. **Vendor Services.** Check all that apply.

- ☐ Equipment manufacturer
- ☐ Subcontractor for cleanup services
- ☐ Prime contractor for full-service remediation
- ☐ Other *(specify)* _____

Vendor Name _____
Technology Type _____

PART 1: GENERAL INFORMATION AND TECHNOLOGY OVERVIEW *(continued)*

Table A

Contaminants/Wastes Associated With Industrial Waste Sources or Types of Sites

1.	Chloro-alkali manufacturing	Chlorine compounds, mercury
2.	Coal gasification	PAHs
3.	Agriculture	Pesticides
4.	Battery recycling/disposal	Lead (acid)
5.	Dry cleaning	Solvents
6.	Electroplating	Chrome, metals
7.	Herbicide manufacturing/use	Pesticides
8.	Industrial landfills	Wastes from Multiple Sources
9.	Inorganic/organic pigments	Solvents, chrome, zinc
10.	Machine shops	Metals, oils
11.	Metal ore mining and smelting	Metals
12.	Municipal landfills	Wastes from multiple sources
13.	Munitions manufacturing	Explosives, lead
14.	Paint/ink formulation	Solvents, some metals (chrome, zinc)
15.	Pesticide manufacturing/use	Pesticides
16.	Petroleum refining and reuse	Petroleum, hydrocarbons, BTEX
17.	Photographic products	Silver, bromide, solvent
18.	Plastics manufacturing	Polymers, phthalates
19.	Pulp and paper industry	Chlorinated organics, dioxins
20.	Other organic chemical manufacturing	Organics, metals (used as catalyst)
21.	Other inorganic chemical manufacturing	Inorganics, metals
22.	Semiconductor manufacturing	Degreasing agents (solvents), metals
23.	Rubber manufacturing	Rubber, plastics, polymers, organics
24.	Wood preserving	Creosote, PCP, arsenic, chrome, PAHs
25.	Uranium mining	Uranium, radioactive metals

Vendor Name _____
Technology Type _____

PART 2: FULL-SCALE EQUIPMENT/CAPABILITIES

You must complete this part if you checked Response 17a (that is, technology is at full scale). You also may complete this part if the technology is at pilot scale.

22. **Major Unit Processes.** In 300 words or less, describe the steps and operation of the full-scale system, including list of key components. Also describe any pre- and post-processing required by your technology. Provide more detail than you did in Question 13.

Vendor Name _____
Technology Type _____

PART 2: FULL-SCALE EQUIPMENT/CAPABILITIES

EXAMPLE

Major Unit Processes

Preprocessing

- Front-end loader and weight scale
- Shredder
- Radial stacker belt conveyor and surge hopper

1. Stockpiled soil is transported to a weigh scale by a front-end loader.
2. Soil is deposited directly on a power shredding device. Classified soil with a top size of less than 2 inches passes through the shredder into the feed conveyor.
3. The feed conveyor is an enclosed radial stacker belt conveyor that is 18 inches wide and 60 feet long. The conveyor discharges into the surge hopper located above the thermal processor. The soil is fed into the LT system at regular intervals to maintain the surge hopper seal.

Processing

- Thermal processor
- Induced draft (ID) fan for vapors
- Horizontal screw conveyor and ash conditioner

1. The thermal processor houses four intermeshed screw conveyors. The function of each screw conveyor is to move soil forward through the processor and to thoroughly mix the material, providing indirect contact between the heat transfer fluid and the soil. The shafts and flights of the screw conveyors and the processor jackets are hollow to allow circulation of a heat transfer fluid (that is, hot oil).
2. Vapors are driven off the soil and are drawn out of the thermal processor by an ID fan.
3. Soil is discharged from the thermal processor onto a horizontal screw conveyor and then an ash conditioner.
4. The conditioner is a ribbon flight screw conveyor. Water spray nozzles installed in the conditioner housing cool the discharge material and minimize fugitive dust emissions.

Postprocessing

- Stacker belt conveyor and dump truck

1. The conditioner discharges onto an inclined stacker belt. The stacker belt conveys the wetted processed soil from the conditioner to the dump truck.

Vendor Name _____
Technology Type _____

PART 2: FULL-SCALE EQUIPMENT/CAPABILITIES *(continued)*

22. **Major Unit Processes** *(continued)*

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Vendor Name _____
Technology Type _____

PART 2: FULL-SCALE EQUIPMENT/CAPABILITIES *(continued)*

23. **Full-Scale Facility** is *(check one only)*

☐ Transportable ☐ Fixed ☐ In situ

b. City _____ and State _____ of fixed facility

24. **Number of Full-Scale Systems.**

_____ Planned/in design _____ Under construction _____ Constructed

25. **Capacity Range per Hour.**

_____ to _____ _____ (units) ☐ Not applicable

26. **Estimated Price Range.** Provide a "ballpark" estimate per unit of waste treated. Include waste preprocessing and exclude excavation, permitting, and disposal of residues.

$_____ to $_____ per _____ (units)

27. **Factors Affecting Unit Price.** With "1" the highest, rank any of the following items that will have a significant effect on unit price. If technology is in situ, excavation and waste handling cannot affect price.

_____ Initial concentration of contaminant
_____ Target concentration of contaminant
_____ Quantity of waste
_____ Depth of contamination
_____ Depth to ground water
_____ Characteristics of residual waste
_____ Moisture content of soil
_____ Site preparation
_____ Waste handling/preprocessing
_____ Amount of debris with waste
_____ Characteristics of soil (classification, permeability)
_____ Utility/fuel rates
_____ Labor rates

_____ Other (specify) _____

28. **Full-Scale Cleanups.**

a. If you are a subcontractor or prime contractor, give the number of full-scale cleanups using your technology that your firm has initiated or completed. Consider only those applications of your technology that were applied at petroleum/hazardous waste sites.

_____

b. If you are an equipment manufacturer, give the number of full-scale cleanups by other firms using your technology of which you are aware. Consider only those applications of your technology that were applied at petroleum/hazardous waste sites

_____

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Vendor Name _____
Technology Type _____

PART 3: PILOT-SCALE EQUIPMENT/CAPABILITIES

You must complete this part if you checked Response Question 17b. You also may complete this part if the technology is at full scale or bench scale.

28. **Major Unit Processes.** In 200 words or less, describe steps and operation of the pilot-scale treatment system, including list of key components. Also describe any pre- and post-processing required by your technology. Provide more detail than you did in Question 13

EXAMPLE

Major Unit Processes

Pilot scale testing involves processing the soils or bulk soils through various operations of reduced-size equipment that when set in series, would be similar to a full-scale operation. The equipment consists of:

1. A hopper and screen for feed preparation; removal of tramp material and sizing, if needed.
2. A mixing or attrition tank where the prepared feed is introduced to the liquids. In the most basic system, extraction of contaminant takes place at this stage.
3. A classification circuit, consisting of a sump, pump, and cyclone for separation of coarse sand, gravel, and organics from fine clays and silts.
4. If extraction of contaminant so requires, coarse material is subjected to a specific gravity (SG) separation through use of a vessel, cyclone, or hydrosizer. Contaminated smaller size material (low SG) is separated from the clean, coarse (high SG) material.
5. Clean, coarse material is dewatered with a screen, although in full scale operation, additional dryers (centrifuges) may be employed.
6. Low SG organics containing contaminant are dewatered with a screen and collected for disposal or secondary treatment
7. Clays and silts are flocculated in a reaction tank and gravity-concentrated in a thickener or clarifier
8. Thickened clays and silts containing contaminant are dewatered in a belt press and sent for disposal or secondary processing.
9. Recycled liquid from the thickening and dewatering process is collected and, in some cases, treated before it is returned to the mixing/attrition tank.

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Vendor Name _____
Technology Type _____

PART 3: PILOT-SCALE EQUIPMENT/CAPABILITIES

29. **Major Unit Processes** *(continued)*.

30. **Pilot-scale facility** is *(Check only one)*

☐ Transportable ☐ Fixed ☐ In Situ

b. City _____ and State _____ of fixed facility

31. **Number of Pilot-Scale Systems**

_____ Planned/in design _____ Under construction _____ Constructed

32. How many times have you used this technology at your facility or at other locations to conduct pilot-scale studies on actual wastes? Count only once multiple studies pertaining to the same site, regardless of the number of different wastes or tests. Do not count tests on surrogate wastes.

_____

33. Can you conduct pilot-scale treatability studies on some types of waste at your location?

☐ Yes ☐ No At a contaminated site? ☐ Yes ☐ No

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Vendor Name _____
Technology Type _____

PART 3: PILOT-SCALE EQUIPMENT/CAPABILITIES *(continued)*

34. **Capacity Range Per Hour.** Prorate capacity of batch processes. This range should be consistent with your answer to Question 35 (the waste requirement for the pilot-scale treatability study).

_____ to _____ _____ (units) ☐ Not applicable

35. **Quantity of Waste Needed for Pilot-Scale Treatability Study.** Give estimated range of quantity of waste needed to test, at the pilot scale, the feasibility of this technology on a specific waste.

_____ to _____ _____ (units)

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Vendor Name _____
Technology Type _____

PART 4: TREATABILITY STUDY CAPABILITIES (BENCH SCALE)

36. Can you conduct bench-scale treatability studies on some types of waste at your location?

☐ Yes ☐ No

37. **Number of Bench-Scale Studies Conducted.** Estimate total number of bench-scale studies conducted on actual waste from different sources or sites. Count only once multiple studies pertaining to the same site, regardless of the number of different wastes or tests. Do not count tests on surrogate wastes.

_____

38. **Description of Bench-Scale Testing Procedures.** In 200 words or less, describe the type of test that would be performed to determine feasibility of this technology for treating a specific waste

EXAMPLE

Description of Bench-Scale Testing Procedures

In our feasibility assessment tests, we usually start with a sample of the soil to be treated and a knowledge of the nature and of each contaminant concentration and the effluent goals to be met. The following steps then are taken

a. The optimal conditions for soil washing are studied, such as pH, time, and chelating agent and concentration.

b. Various likely adsorbents are studied on a batch basis to determine which are most effective at removing the metals of interest from the chelating agent in the washing water.

c. One or more selected media then are studied on columns to determine their ability to retain metals in a continuous-flow situation.

d. For the surviving adsorbent(s), the ion elution performance then is determined; after this step, one resin will have been selected as optimal for the particular task under study.

e. The selected adsorbent then is subjected to a number of charge and regeneration cycles to establish its ruggedness.

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Vendor Name _____
Technology Type _____

PART 4: TREATABILITY STUDY CAPABILITIES (BENCH SCALE)

39. List as many as *five* representative projects that also can serve as references. List information for only one project per sheet. For projects that have more than one application, fill out a separate sheet for each application. Provide only the performance data that is specific to each project listed. Full- and pilot-scale projects are of most importance. EPA reserves the right to add information on projects conducted for the federal government of which EPA is aware.

a.

Site Name or Industry Type if Client Identity is Confidential:	
Site Type or Waste Source (Check all that apply)	

___ Agriculture	___ Machine shops	___ Other inorganic chemical manufacturing
___ Battery recycling/disposal	___ Metal ore mining and smelting	___ Semiconductor manufacturing
___ Chloro-alkali manufacturing	___ Municipal Landfill	___ Rubber manufacturing
___ Coal gasification	___ Munitions Manufacturing	___ Wood preserving
___ Dry cleaning	___ Paint/ink formulation	___ Uranium mining
___ Electroplating	___ Pesticide manufacturing/use	
___ Gasoline service station/petroleum storage facility	___ Petroleum refining and reuse	
	___ Photographic products	___ Others *(specify)* _____
___ Herbicide manufacturing/use	___ Plastics manufacturing	
___ Industrial landfills	___ Pulp and paper industry	
___ Inorganic/organic pigments	___ Other organic chemical manufacturing	

Location	Project took place at site named	At another site (that is, a Test facility)
City _____	_____ Yes	_____ Yes
State/Province: _____	_____ No	_____ No
Country _____		
Regulation/Statute/Organization (Check all that apply)	Application or Project Type (Check all that apply)	

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Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

___ RCRA corrective action	___ Full-scale cleanup	___ EPA SITE Emerging Technology Program
___ CERCLA	___ Field demonstration	___ Research
___ TSCA	___ Pilot-scale treatability study	___ Other (specify) _____
___ Safe Drinking Water Act	___ Bench-scale treatability study	
___ UST corrective action	___ RCRA Research, Development, and Demonstration	
___ State (specify) _____	___ TSCA National Demonstration	
___ DOD	___ TSCA Research and Development	
___ DOE	___ EPA SITE Demonstration Program	
___ Other (specify) _____		
___ Not Applicable		

Media Treated *(Check all that apply)*

___ Soil (in situ)	___ Ground water in situ
___ Soil (ex situ)	___ Off-gas from a primary treatment technology
___ Sludge	___ Dense nonaqueous phase liquids (DNAPL) (in situ)
___ Solid	___ Light nonaqueous phase liquids (LNAPL) (in situ)
___ Natural sediment (in situ)	
___ Natural sediment (ex situ)	

Volume/Quantity Treated	Equipment Scale (Check one only)	Project Status
_____ _____ (units)		Contracted
Area treated (for in situ projects)	___ Bench	Month _____ Year _____
_____ _____ (units)	___ Pilot	In cleanup Yes ___ No ___
Depth treated (for in situ projects)	___ Full	Completed
_____ _____ (units)		Month _____ Year _____

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Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

a. (continued)

Note: (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data

(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	ppm	25 - 50	ppm	50	ppm

Cost Information

Estimated or actual total and/or unit cost for this project
$ _____ per _____ (unit)
$ _____ (total)

What items or activities are included in these cost(s) (e.g., mobilization demobilization, excavation, waste handling)? _____

Person outside of company familiar with project (optional)
Name _____ Company _____
Address _____

Is Literature Available on this Project? (You may wish to include these citations in Part 6)
___ Yes ___ No

Additional project information site conditions, mode of operation, and other pertinent information) _____

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Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

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Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

Site Name or Industry Type if Client Identity is Confidential: _____

Site Type or Waste Source (Check all that apply)

___ Agriculture
___ Battery recycling/disposal
___ Chlor-alkali manufacturing
___ Coal gasification
___ Dry cleaning
___ Electroplating
___ Gasoline service station/petroleum storage facility
___ Herbicide manufacturing/use
___ Industrial landfills
___ Inorganic/organic pigments
___ Machine shops
___ Metal ore mining and smelting
___ Municipal landfill
___ Munitions Manufacturing
___ Paint/ink formulation
___ Pesticide manufacturing/use
___ Petroleum refining and reuse
___ Photographic products
___ Plastics manufacturing
___ Pulp and paper industry
___ Other organic chemical manufacturing
___ Other inorganic chemical manufacturing
___ Semiconductor manufacturing
___ Rubber manufacturing
___ Wood preserving
___ Uranium mining
___ Others (specify) _____

Location
City _____
State/Province _____
Country _____

Project took place at site named
___ Yes
___ No

At another site (that is, a Test facility)
___ Yes
___ No

Regulation/Statute/Organization (Check all that apply)

___ RCRA corrective action
___ CERCLA
___ TSCA
___ Safe Drinking Water Act
___ UST corrective action
___ State (specify) _____
___ DOD
___ DOE
___ Other (Specify) _____
___ Not Applicable

Application or Project Type (Check all that apply)

___ Full scale cleanup
___ Field demonstration
___ Pilot scale treatability study
___ Bench-scale treatability study
___ RCRA Research, Development and Demonstration
___ TSCA Release Demonstration
___ TSCA Research and Development
___ EPA SITE Demonstration Program
___ EPA SITE Emerging Technology Program
___ Research
___ Other (specify) _____

Media Treated (Check all that apply)

___ Soil (in situ)
___ Soil (ex situ)
___ Sludge
___ Solid
___ Natural sediment (in situ)
___ Natural sediment (ex situ)
___ Ground water in situ
___ Off-gas from a primary treatment technology
___ Dense nonaqueous phase liquids (DNAPL) (in situ)
___ Light nonaqueous phase liquids (LNAPL) (in situ)

Volume/Quantity Treated
_____ _____ (Units)
Area treated (for in situ projects)
_____ _____ (Units)
Depth treated (for in situ projects)
_____ _____ (Units)

Equipment Scale (Check one only)
___ Bench
___ Pilot
___ Full

Project Status
Contracted
Month _____ Year _____
In cleanup Yes ___ No ___
Completed
Month _____ Year _____

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Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

b. (continued)

Note: (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site

Performance Data

(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	ppm	25 - 50	ppm	50	ppm

Cost Information

Estimated or actual total and/or unit cost for this project
$ _____ per _____ (unit)
$ _____ (total)

What items or activities are included in these cost(s) (e.g., mobilization, demobilization, excavation, waste handling)? _____

Person outside of company familiar with project (optional)
Name _____ Company _____
Address _____

Is Literature Available on this Project? (You may wish to include these citations in Part 6)
___ Yes ___ No

Additional project information site conditions, mode of operation, and other pertinent information) _____

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Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

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Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

c.

Site Name or Industry Type if Client Identity is Confidential: _____

Site Type or Waste Source (Check all that apply)

___ Agriculture	___ Machine shops	___ Other inorganic chemical manufacturing
___ Battery recycling/disposal	___ Metal ore mining and smelting	___ Semiconductor manufacturing
___ Chlore-alkali manufacturing	___ Municipal Landfill	___ Rubber manufacturing
___ Coal gasification	___ Munitions Manufacturing	___ Wood preserving
___ Dry cleaning	___ Paint/ink formulation	___ Uranium mining
___ Electroplating	___ Pesticide manufacturing/use	
___ Gasoline service station/petroleum storage facility	___ Petroleum refining and route	
	___ Photographic products	___ Others (specify) _____
	___ Plastics manufacturing	
___ Herbicide manufacturing/use	___ Pulp and paper industry	
___ Industrial landfills	___ Other organic chemical manufacturing	
___ Inorganic/organic pigments		

Location	Project took place at site named	At another site (that is, a Test facility)
City _____	___ Yes	___ Yes
State/Province _____	___ No	___ No
Country _____		

Regulation/Statute/Organization (Check all that apply)	Application or Project Type (Check all that apply)	
___ RCRA corrective action	___ Full-scale cleanup	___ EPA SITE Emerging Technology Program
___ CERCLA	___ Field demonstration	___ Research
___ TSCA	___ Pilot-scale treatability study	___ Other (specify) _____
___ Safe Drinking Water Act	___ Bench-scale treatability study	
___ UST corrective action	___ RCRA Research, Development, and Demonstration	
___ State (specify) _____	___ TSCA National Demonstration	
___ DOD	___ TSCA Research and Development	
___ DOE	___ EPA SITE Demonstration Program	
___ Other (Specify) _____		
___ Not Applicable		

Media Treated (Check all that apply)	
___ Soil (in situ)	___ Ground water in situ
___ Soil (ex situ)	___ Off-gas from a primary treatment technology
___ Sludge	___ Dense nonaqueous phase liquids (DNAPL) (in situ)
___ Solid	___ Light nonaqueous phase liquids (LNAPL) (in situ)
___ Natural sediment (in situ)	
___ Natural sediment (ex situ)	

Volume/Quantity Treated	Equipment Scale (Check one only)	Project Status
___ ___ (Units)	___ Bench	Contracted Month ___ Year ___
Area treated (for in situ projects) ___ ___ (Units)	___ Pilot	In cleanup Yes ___ No ___
Depth treated (for in situ projects) ___ ___ (Units)	___ Full	Completed Month ___ Year ___

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Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

c. (continued)

Note. (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units, for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data

(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	ppm	25 - 50	ppm	50	ppm

Cost Information

Estimated or actual total and/or unit cost for this project	What items or activities are included in these cost(s) (e.g., mobilization, demobilization, excavation, waste handling)?
$ _____ per _____ (unit)	
$ _____ (total)	

Person outside of company familiar with project (optional)	Is Literature Available on this Project? (You may wish to include these citations in Part 6)
Name _____ Company _____	___ Yes ___ No
Address _____	

Additional project information site conditions, mode of operation, and other pertinent information) _____

EPA Form 9210-1 (Rev. 7-93) E-27

Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

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Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

d.

Site Name or Industry Type if Client Identity is Confidential:	

Site Type or Waste Source (Check all that apply)

____	Agriculture	____	Machine shops	____	Other inorganic chemical manufacturing
____	Battery recycling/disposal	____	Metal ore mining and smelting	____	Semiconductor manufacturing
____	Chloro-alkali manufacturing	____	Municipal Landfill	____	Rubber manufacturing
____	Coal gasification	____	Munitions Manufacturing	____	Wood preserving
____	Dry cleaning	____	Paint/ink formulation	____	Uranium mining
____	Electroplating	____	Pesticide manufacturing/use	____	Others (specify) _____
____	Gasoline service station/petroleum storage facility	____	Petroleum refining and reuse		
____	Herbicide manufacturing/use	____	Photographic products		
____	Industrial landfills	____	Plastics manufacturing		
____	Inorganic/organic pigments	____	Pulp and paper industry		
		____	Other organic chemical manufacturing		

Location	Project took place at site named	At another site (that is, a Test facility)
City _____	____ Yes	____ Yes
State/Province _____	____ No	____ No
Country _____		

Regulation/Statute/Organization (Check all that apply)	Application or Project Type (Check all that apply)	
____ RCRA corrective action	____ Full-scale cleanup	____ EPA SITE Emerging Technology Program
____ CERCLA	____ Field demonstration	____ Research
____ TSCA	____ Pilot-scale treatability study	____ Other (specify) _____
____ Safe Drinking Water Act	____ Bench-scale treatability study	
____ UST corrective action	____ RCRA Research, Development, and Demonstration	
____ State (specify) _____	____ TSCA National Demonstration	
____ DOD	____ TSCA Research and Development	
____ DOE	____ EPA SITE Demonstration Program	
____ Other (Specify) _____	**Media Treated (Check all that apply)**	
____ Not Applicable	____ Soil (in situ)	____ Ground water in situ
	____ Soil (ex situ)	____ Off-gas from a primary treatment technology
	____ Sludge	____ Dense nonaqueous phase liquids (DNAPL) (in situ)
	____ Solid	____ Light nonaqueous phase liquids (LNAPL) (in situ)
	____ Natural sediment (in situ)	
	____ Natural sediment (ex situ)	

Volume/Quantity Treated	Equipment Scale (Check one only)	Project Status
____ ____ (Units)	____ Bench	Contracted
Area treated (for in situ projects)	____ Pilot	Month ____ Year ____
____ ____ (Units)	____ Full	In cleanup Yes ____ No ____
Depth treated (for in situ projects)		Completed
____ ____ (Units)		Month ____ Year ____

EPA Form 9210-1 (Rev. 7-93) E-29

Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

d. (continued)

Note: (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write ND; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such

(4) Specify the cleanup standard or goal, if known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data

(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	ppm	25 - 50	ppm	50	ppm

Cost Information

Estimated or actual total and/or unit cost for this project	What items or activities are included in these cost(s) (e.g., mobilization, demobilization, excavation waste handling)?
$ _____ per _____ (unit)	
$ _____ (total)	

Person outside of company familiar with project (optional)	Is Literature Available on this Project? (You may wish to include these citations in Part 6)
Name _____ Company _____	____ Yes ____ No
Address _____	

Additional project information site conditions, mode of operation, and other pertinent information).

EPA Form 9210-1 (Rev. 7-93) E-30

Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

EPA Form 9210-1 (Rev. 7-93) E-31

Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

d.

Site Name or Industry Type if Client Identity is Confidential:	

Site Type or Waste Source (Check all that apply)

____	Agriculture	____	Machine shops	____	Other inorganic chemical manufacturing
____	Battery recycling/disposal	____	Metal ore mining and smelting	____	Semiconductor manufacturing
____	Chloro-alkali manufacturing	____	Municipal Landfill	____	Rubber manufacturing
____	Coal gasification	____	Munitions Manufacturing	____	Wood preserving
____	Dry cleaning	____	Paint/ink formulation	____	Uranium mining
____	Electroplating	____	Pesticide manufacturing/use	____	Others (specify) _____
____	Gasoline service station/petroleum storage facility	____	Petroleum refining and reuse		
____	Herbicide manufacturing/use	____	Photographic products		
____	Industrial landfills	____	Plastics manufacturing		
____	Inorganic/organic pigments	____	Pulp and paper industry		
		____	Other organic chemical manufacturing		

Location	Project took place at site named	At another site (that is, a Test facility)
City _____	____ Yes	____ Yes
State/Province _____	____ No	____ No
Country _____		

Regulation/Statute/Organization (Check all that apply)	Application or Project Type (Check all that apply)	
____ RCRA corrective action	____ Full scale cleanup	____ EPA SITE Emerging Technology Program
____ CERCLA	____ Field demonstration	____ Research
____ TSCA	____ Pilot scale treatability study	____ Other (specify) _____
____ Safe Drinking Water Act	____ Bench-scale treatability study	
____ UST corrective action	____ RCRA Research, Development, and Demonstration	
____ State (specify) _____	____ TSCA National Demonstration	
____ DOD	____ TSCA Research and Development	
____ DOE	____ EPA SITE Demonstration Program	
____ Other (Specify) _____	**Media Treated (Check all that apply)**	
____ Not Applicable	____ Soil (in situ)	____ Ground water in situ
	____ Soil (ex situ)	____ Off-gas from a primary treatment technology
	____ Sludge	____ Dense nonaqueous phase liquids (DNAPL) (in situ)
	____ Solid	____ Light nonaqueous phase liquids (LNAPL) (in situ)
	____ Natural sediment (in situ)	
	____ Natural sediment (ex situ)	

Volume/Quantity Treated	Equipment Scale (Check one only)	Project Status
____ ____ (Units)	____ Bench	Contracted
Area treated (for in situ projects)	____ Pilot	Month ____ Year ____
____ ____ (Units)	____ Full	In cleanup Yes ____ No ____
Depth treated (for in situ projects)		Completed
____ ____ (Units)		Month ____ Year ____

EPA Form 9210-1 (Rev. 7-93) E-32

Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

e. (continued)

Note: (1) List one specific contaminant per line. Do not list such entire contaminant groups as VOCs or solvents. TPH, which can be analyzed using a specific test method, can be listed as an individual contaminant.

(2) and (3) Indicate the appropriate units; for concentrations that were non-detect write N.D.; treated concentration should be lower than untreated concentration unless the technology is dewatering or some other volume reduction method. If a concentration range cannot be given, provide an average and note it as such.

(4) Specify the cleanup standard or goal. If known, for the individual contaminant for this project. For example, if the project was part of a Superfund remedial action, the cleanup goal is specified in the record of decision (ROD) for that site.

Performance Data

(1) Contaminant or Pollutant Parameter	(2) Untreated Concentration Range (Min to Max)	(3) Units	(2) Treated Concentration Range (Min to Max)	(3) Units	(4) Cleanup Standard or Goal	(3) Units
(Example) Benzene	50 - 150	ppm	25 - 50	ppm	50	ppm

Cost Information

Estimated or actual total and/or unit cost for this project

$ _____ per _____ (unit)

$ _____ (total)

What items or activities are included in these cost(s) (e.g., mobilization, demobilization, excavation, waste handling)? _____

Person outside of company familiar with project (optional)

Name _____ Company _____

Address _____

Is Literature Available on this Project? (You may wish to include these citations in Part 6)

___ Yes ___ No

Additional project information are conditions, mode of operation, and other pertinent information). _____

EPA Form 9210-1 (Rev. 7-93) E-33

Vendor Name _____
Technology Type _____

PART 5: REPRESENTATIVE APPLICATIONS, CLIENT REFERENCES, AND PERFORMANCE DATA

(continued)

EPA Form 9210-1 (Rev. 7-93) E-34

Vendor Name _____
Technology Type _____

PART 6: LITERATURE AND TECHNICAL REFERENCES

40. List and attach available documentation (for example, journal articles, conference papers, patents) that best describes technology and vendor capabilities. References that contain performance and cost data are of particular interest. **Do not include personal references.** EPA reserves the right to add to the list other publicly available references.

Author(s) _____
Title _____
_____
Journal/Conference _____
Date _____ NTIS/EPA Document Number(s) _____

Author(s) _____
Title _____
_____
Journal/Conference _____
Date _____ NTIS/EPA Document Number(s) _____

Author(s) _____
Title _____
_____
Journal/Conference _____
Date _____ NTIS/EPA Document Number(s) _____

Author(s) _____
Title _____
_____
Journal/Conference _____
Date _____ NTIS/EPA Document Number(s) _____

Author(s) _____
Title _____
_____
Journal/Conference _____
Date _____ NTIS/EPA Document Number(s) _____

EPA Form 9210-1 (Rev. 7-93) E-35

APPENDIX F

ALTERNATIVE TREATMENT TECHNOLOGY INFORMATION CENTER (ATTIC) BROCHURE

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ATTIC

U.S. EPA • Office of Environmental Engineering & Technology Demonstration • MARCH 1994

What Is ATTIC?

The Alternative Treatment Technology Information Center (ATTIC) is a comprehensive computer database system providing up-to-date information on innovative treatment technologies. Currently being revised, ATTIC v2.0 will provide access to several independent databases as well as a mechanism for retrieving full-text documents of key literature. The system provides information you need to make effective decisions on hazardous waste clean-up alternatives. It can be accessed with a personal computer (PC) and modem 24 hours a day, and there are no user fees.

What Can ATTIC Do for You?

ATTIC helps you:

- Find innovative solutions for permanent remedies at hazardous waste sites.
- Save time and resources by providing "one stop shopping" for information on alternative treatment options. ATTIC v2.0 provides access to several additional databases including:
  - Treatment Technology Database
  - Treatability Study Database
  - Underground Storage Tank Database
  - Oil/Chemical Spill Database
- Streamline your search for information by providing searchable abstracts that allow you to quickly screen hundreds of source documents. ATTIC v2.0 focuses searches on the best references, as determined by known experts in the field.
- Download files which may be search results or complete texts of key literature.
- Keep up to date with the latest information on upcoming conferences and other events.
- Communicate with your peers and learn from their experiences in applying innovative technologies.

What is in the Treatment Technology Database?

This database contains information on:

Biological Treatment

Biological treatment processes use microorganisms and the enzymes they produce to transform or degrade hazardous contaminants found in groundwater, surface water, soil, sediment, and sludges. Biological treatment processes include bioreactors, biofilters, ponds and lagoons, land treatment, composting, and subsurface aerobic/anaerobic treatment.

Chemical Treatment

Chemical treatment processes involve chemical reactions which alter or destroy a hazardous waste component. Chemical treatment can be applied to both organic and inorganic wastes, and may be formulated to address specific target compounds in a mixed waste. Typical chemical treatment processes include oxidation-reduction reactions such as ozonization, photolysis, dehalogenation, and chemical precipitation.

Physical Treatment

Physical treatment processes separate the waste stream by either applying physical force or changing the physical form of the waste. Physical treatment can be applied to a wide variety of liquid and solid wastes, but further treatment is often required. Physical treatment processes include adsorption, filtration, distillation, air stripping, evaporation, and freeze crystallization.

Solidification/Stabilization

Solidification/stabilization processes immobilize hazardous constituents in waste by converting them into their least soluble, mobile, or toxic form: by binding them in an immobile, insoluble matrix; and/or by binding them in a matrix which minimizes the material surface exposed to weathering and leaching. Solidification/stabilization processes include cement-based fixation, encapsulation, pozzolanic-based fixation, and vitrification.

Thermal Treatment

Thermal treatment processes use energy to destroy or detoxify hazardous liquids, sludges, and solids. These technologies include low and high energy thermal processes. Typical thermal treatment processes include flame combustion, infrared incineration, rotary kiln, pyrolysis, and plasma heat systems.

What is in the RREL Treatability Database?

This database provides performance information on innovative treatment technologies. The data are derived from treatability studies; in the future performance and cost information from full-scale treatment systems will be included. The database is available through the ATTIC system or separately as a disk that will be mailed to you free of charge from EPA.

What is in the UST Database?

Formerly known as the Computerized On-line Information System (COLIS), the UST (Underground Storage Tank) database presents information on underground storage tank corrective actions, surface spills, emergency response, and remedial actions. It allows retrieval of information to help select appropriate, cost-effective solutions.

It includes:

- Case History File on clean-ups at various UST incidents.
- SITE Program Applications Analysis Reports, with ability for full-text retrieval, for those innovative technologies applicable to UST sites.
- Library Search System to retrieve data such as descriptive records and abstracts in the EPA technical files.

What is in the Oil/Chemical Spill Database?

Approximately 150 publications from EPA's Office of Research and Development have been abstracted and included in this database to provide information on the treatment and disposal of spilled oil and chemicals. This small database is being expanded to include key literature produced by organizations other than EPA.

Why Should You Use ATTIC?

ATTIC accommodates your busy schedule with:

- Quick searches of hundreds of the best literature abstracts on alternative treatment technologies.
- Free access 24 hours a day, 7 days a week.

ATTIC includes information from a broad range of sources, such as:

- Superfund Innovative Technology Evaluation (SITE) Program
- Records of Decision (RODs)
- RCRA Delisting Actions
- Removal Actions
- Treatability Studies
- NATO/International Studies
- U.S. Air Force
- U.S. Army Environmental Center
- State Agencies
- Industry Field Studies/Remedial Projects
- Conferences and Symposia
- Technical Journals and Bulletins

How Do You Get Into ATTIC?

You can access ATTIC using either an IBM (or compatible) PC, Apple, or a dumb terminal equipped with a modem (1200, 2400, 9600, 14400 baud) and appropriate communications software (e.g., CrossTalk™, PROCOMM™).

To access ATTIC directly, set your PC communications software as follows:

Name	ATTIC
Number	703–908–2138
Baud Supported	Up to 14.400
Parity	N
Data Bits	8
Stop Bits	1
Terminal Emulations	ANSI, VT100, ASCII, TTY, None
Duplex	Full

Once you have accessed ATTIC all functions are easily performed using abbreviated commands. ATTIC is also equipped with a built-in help function: anytime you need help, type H for an easy guide to the menu.

For Further Information

Call the ATTIC Hotline:

TEL: (703) 908-2137

Or contact the ATTIC Program Manager:

Daniel Sullivan, P.E.
U.S. EPA (MS 106)
2890 Woodbridge Ave
Edison, NJ 08837-3679

TEL: (908) 321-6677
FAX: (908) 906-6990

APPENDIX G

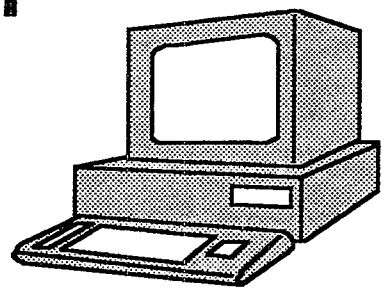
CLEAN-UP INFORMATION BULLETIN BOARD (CLU-IN) FACT SHEET

United States Environmental Protection Agency
EPA/542/F-93/001
February 1993

Solid Waste and Emergency Response (OS-110W)

EPA

Exchanging Technology Information on



CLU-IN

Cleanup Information Bulletin Board

Printed on Recycled Paper

Choosing CLU-IN: Information Offered

The Cleanup Information Bulletin Board System (CLU-IN) is designed for hazardous waste cleanup professionals who need current information on innovative technologies and remediation and would like to consult with other professionals online. CLU-IN is used by those involved in the cleanup of Superfund, Resource Conservation and Recovery Act corrective action, and underground storage tank sites. Users include EPA and other Federal and State personnel, consulting engineers, technology vendors, remediation contractors, researchers, community groups, and individual citizens.

CLU-IN offers many different types of information from many sources. Some items are intended to be read online; others may be copied to your computer for use at your convenience. In addition to the examples below, the message exchange on CLU-IN is an excellent source of up-to-date information.

Text of Articles from EPA Newsletters

Tech Trends. Provides descriptions and performance data for innovative technologies that actually have been applied in the field. Five issues per year.

Ground Water Currents. A new publication that provides information on the development and demonstration of innovative groundwater remediation techniques. Reports on technologies, new regulations that impact groundwater remediation, discussions on issues such as DNAPLs, and information on conferences and publications.

Bioremediation in the Field. An information update on applying bioremediation to site cleanup. Offers articles describing treatability studies underway, a table detailing CERCLA, RCRA, UST, and TSCA sites planning, operating, or having completed bioremediation projects, and technical support and publications offered by EPA.

EPA HQ Library's *OERR Infoline.* A current awareness tool from the EPA library including references to upcoming meetings and conferences, new journal articles, EPA reports, reference works, and other documents.

More EPA Publications

Compendium of Superfund Program Publications. Lists of Superfund Directives by title, subject, and EPA directive and report numbers, as well as directions on how to order the documents.

Innovative Treatment Technologies: Semi-Annual Status Report. Offers information on applications of innovative treatment technologies for remedial and removal actions, organized in extensive tables providing detailed site-specific information.

TIO's Innovative Technology Bibliography. Provides descriptions and order numbers for publications related to all aspects of the choice and application of innovative technologies.

Other Regularly Updated Information

Training Calendars. Quarterly updates provide titles, dates, and locations of courses, organized by EPA Region, and provide a contact and phone number to register.

RCRA/CERCLA/OUST/EPCRA Hotline Monthly Report. Commonly asked questions and answers about regulations. Also details new publications.

Federal Register. Summaries of recent notices related to Hazardous Waste and Ground Water. Citations for all EPA regulations.

Commerce Business Daily. Weekly update containing the text of *Commerce Business Daily* announcements for hazardous waste remediation.

National Priorities List

Upcoming Conferences, Workshops, and Demonstrations of Innovative Technologies.

Databases

UST Case Study Data System. Contains over 200 case studies that were developed to support RCRA rule and guidance development activities affecting facility location, RCRA corrective action, and closure.

Risk Reduction Engineering Laboratory (RREL) Treatability Database. Provides a thorough review of the effectiveness of proven, commercially available treatment tech-nologies for the removal or destruction of chemicals from media such as municipal and industrial wastewater, drinking water, groundwater, soil, debris, sludge, and sediment.

Air Methods Database. A database of methods for measuring the levels of toxic pollutants in ambient and indoor air.

Using CLU-IN: A Typical Session

If you are looking for information on a particular topic, there are several features available to help you find information. Suppose you are looking for information on cleaning up TCE. You could use the following commands to scan through CLU-IN:

Text Scan (TS). Scan the public messages for the word TCE. Typical messages include one about the use of soil washing technology by a university to remediate TCE-contaminated soil and one about TCE contamination at a federal facility.

Scan the Text of Bulletins (B S). A search of the text of bulletins for the word TCE finds the following:

- Article from *Tech Trends* entitled, "Finding Cleanup Alternatives for TCE and PCE."
- Innovative Technologies Bibliography citation for a guidance document on remediation of sites contaminated with TCE.
- Announcement of a SITE program technology demonstration for treating TCE contaminated ground water.
- Agenda for an upcoming Forum on Innovative Hazardous Waste Treatment Technologies: Domestic and International, listing two sessions on treating TCE contamination.

Download Files (D)

- Items from the *Bioremediation in the Field* newsletter including a list of sites planning, operating, or considering bioremediation for cleaning up TCE and an article entitled, "RSKERL proposes new injection well design for *in situ* biotreatment of a TCE plume, St. Joseph, MI."
- Innovative Treatment Technologies: Semi-Annual Status Report (outlines the status of projects using innovative technologies to remediate TCE contamination).

Dialing CLU-IN: Connecting & Getting Help

How to Connect

To log onto CLU-IN you need a computer, a modem, a phone line, and telecommunications software. CLU-IN supports 1200, 2400, and 9600 baud modems. The phone number is 301-589-8366. The communications parameters are 8 data bits, 1 stop bit, and no parity.

Getting Help with Menu Choices Online

Detailed assistance is available through online help on CLU-IN. To get help with any CLU-IN prompt except the "Main Board Command?" prompt, type H. You will get a list of choices for responses to that prompt. From the "Main Board Command?" prompt, type H followed by the menu option for which you want help. For example, for help with the "Read command," type H R.

Getting Voice Help

Call the System Operator (SYSOP) on the Help Line at 301-589-8368 for help with connecting to CLU-IN or using CLU-IN commands.

Available Printed Information on CLU-IN

The following documents can be ordered by calling the SYSOP at 301-589-8368 or sending or faxing your order to:
National Center for Environmental Publications and Information
11029 Kenwood Road, Building 5
Cincinnati, OH 45242
513-891-6685 (fax)

User's Manual (Version 4.2). Gives detailed instructions on operating the bulletin board. Does not provide lists of current information. The manual also can be ordered online by filling out Script Questionnaire #2 on CLU-IN. (Publication number: EPA/542/B-93/002)

A Guided Tour of CLU-IN. Walks you through an online session keystroke by keystroke. (Publication number: EPA/542/B-93/003)

CLU-IN Contacts

SYSOP: 301-589-8368

EPA Project Officer: Gary Turner
Technology Innovation Office
703-308-7025

*U.S. Government Printing Office: 1994 — 515-003/01032

EPA
United States
Environmental Protection Agency
(5102W)
Washington, DC 20460

Official Business
Penalty for Private Use
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