

# The Superfund Innovative Technology Evaluation Program

Annual Report to Congress  
FY 2000



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FY 2000

Office of Research and Development  
U.S. Environmental Protection Agency  
Washington, DC 20460

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## **Notice**

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## Foreword

The U.S. Environmental Protection Agency (EPA) is charged by Congress with protecting the Nation's land, air, and water resources. Under a mandate of national environmental laws, the Agency strives to formulate and implement actions leading to a compatible balance between human activities and the ability of natural systems to support and nurture life. To meet this mandate, EPA's research program is providing data and technical support for solving environmental problems today and building a science knowledge base necessary to manage our ecological resources wisely, understand how pollutants affect our health, and prevent or reduce environmental risks in the future.

The National Risk Management Research Laboratory (NRMRL) is the Agency's center for investigation of technological and management approaches for preventing and reducing risks from pollution that threaten human health and the environment. The focus of the Laboratory's research program is on methods and their cost-effectiveness for prevention and control of pollution to air, land, water, and subsurface resources; protection of water quality in public water systems; remediation of contaminated sites, sediments and ground water; prevention and control of indoor air pollution; and restoration of ecosystems. NRMRL collaborates with both public and private sector partners to foster technologies that reduce the cost of compliance and to anticipate emerging problems. NRMRL's research provides solutions to environmental problems by: developing and promoting technologies that protect and improve the environment; advancing scientific and engineering information to support regulatory and policy decisions; and providing the technical support and information transfer to ensure implementation of environmental regulations and strategies at the national, state, and community levels.

This publication has been produced as part of the Laboratory's strategic long-term research plan. It is published and made available by EPA's Office of Research and Development to assist the user community and to link researchers with their clients.

E. Timothy Oppelt, Director  
National Risk Management Research Laboratory



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## Contents

| <u>Section</u>   | <u>Page</u> |
|--|-------------|
| Notice .....   | ii          |
| Foreword .....   | iii         |
| Figures and Tables .....   | vi          |
| Acronyms .....   | vii         |
| Executive Summary .....  | ix          |
| <b>SITE Program Description .....</b>  | <b>1</b>    |
| Introduction .....   | 1           |
| Program Design .....   | 2           |
| Program Implementation .....   | 2           |
| Program Principles .....   | 3           |
| <b>FY 00 SITE Program Cost Savings and Vendor Benefits .....</b>                         | <b>7</b>    |
| Promotion of Innovative Technologies .....   | 7           |
| Historical Program Cost Savings and Vendor Contracting .....                             | 8           |
| <b>Innovative Technology Highlights .....</b>  | <b>13</b>   |
| SITE Program Case Studies .....  | 13          |
| Case Study 1: Terra-Kleen Response Group Inc. ....                                       | 13          |
| Case Study 2: Iron Reactive Barrie .....   | 14          |
| Case Study 3: Update .....   | 14          |
| <b>FY 00 Progress and Accomplishments .....</b>  | <b>15</b>   |
| Demonstration Program .....  | 15          |
| Emerging Technology Program .....  | 16          |
| Monitoring and Measurement Technologies Program .....                                    | 16          |
| <b>Future Direction .....</b>  | <b>23</b>   |
| Introduction .....   | 23          |
| Technology Areas of Primary Interest .....   | 23          |
| MMT Program Areas of Interest .....  | 24          |
| Partnerships for Success .....   | 24          |
| Information Transfer .....   | 27          |
| <u>Appendices</u>  |             |
| A - SITE Projects (Alphabetically by Developer State) .....                              | A-1         |
| B - SITE Technology Demonstration Sites (Alphabetically by Demonstration Site State) ... | B-1         |
| C - Publications - Information Transfer Product Descriptions .....                       | C-1         |
| D - Electronic Technical Information Resources .....                                     | D-1         |
| E - Glossary of Remediation Technologies .....   | E-1         |

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## Figures

| <u>Number</u> |   | <u>Page</u> |
|---------------|---|-------------|
| 1             | Location of SITE demonstration and MMT projects . . . . .   | 1           |
| 2             | Superfund remedial actions: in situ technologies for source control . . . . .                     | 8           |
| 3             | Cost savings estimated from RODs analysis by technology type . . . . .                            | 10          |
| 4             | Categorization of contracts awarded to SITE vendors following program participation               | 11          |
| 5             | Total number of contracts awarded to SITE vendors after program participation . . . . .           | 12          |
| 6             | Share of 3,229 total contracts awarded to SITE demonstration vendors by technology type . . . . . | 12          |
| 7             | Distribution of in situ and ex situ SITE demonstration projects at the end of FY 00 . . .         | 16          |

## Tables

| <u>Number</u> |  | <u>Page</u> |
|---------------|--|-------------|
| 1             | SITE demonstration projects completed in FY 00 . . . . .     | 17          |
| 2             | SITE demonstration ongoing projects in FY 00 . . . . .       | 19          |
| 3             | SITE MMT program demonstrations completed in FY 00 . . . . . | 21          |
| 4             | Future SITE priority areas 2001-2005 . . . . .               | 25          |
| 5             | Future contaminant emphasis areas 2000-2005 . . . . .        | 25          |
| 6             | SITE program projects FY 01 . . . . .                        | 25          |
| 7             | DNAPL testing site roadmap: media . . . . .                  | 26          |

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## Acronyms

|           |  |
|-----------|--|
| ANSI/ASQC | American National Standard Institute, Assistance for Environmental Data Collection and Environmental Technology Programs |
| DNAPL     | Dense non-aqueous phase liquids  |
| DOD       | Department of Defense  |
| DOE       | Department of Energy   |
| ECOS      | Environmental Council of States  |
| EPA       | Environmental Protection Agency  |
| ESTCP     | Environmental Security and Technology Certification Program  |
| ETV       | Environmental Technologies Verification  |
| FY        | Fiscal year  |
| GPR       | Ground penetrating radar   |
| IDC       | Interagency DNAPL Consortium   |
| ITRC      | Interstate Technology and Regulatory Cooperation   |
| MHI       | Mitsubishi Heavy Industries  |
| MMT       | Monitoring and Measurement Technologies  |
| NELP      | Navy Environmental Leadership Program  |
| NPL       | National Priorities List   |
| NRC       | National Research Council  |
| ORD       | Office of Research and Development   |
| PAHs      | Polynuclear aromatic hydrocarbons  |
| PCBs      | Polychlorinated biphenyls  |
| REACHIT   | Remediation Characterization Innovative Technologies   |
| RCI       | White House Rapid Commercialization Initiative   |
| SITE      | Superfund Innovative Technology Evaluation   |
| TIO       | Technology Innovation Office   |
| TPH       | Total petroleum hydrocarbon  |
| VOC       | Volatile Organic Compound  |



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## **Executive Summary**

The Superfund Innovative Technology Evaluation (SITE) Program has successfully promoted the development, commercialization and implementation of innovative hazardous waste treatment technologies for 15 years. SITE offers a mechanism for conducting joint technology demonstration and evaluation projects at hazardous waste sites involving the private sector, EPA, and other federal and state agencies. The program provides environmental decision-makers with relevant data on new, viable remediation technologies that may have performance or cost advantages compared to conventional treatment technologies. Since the initiation of the SITE Program in 1986, cleanup of contaminated sites through the use of innovative technologies has resulted in an estimated total inflated cost savings of over 2.6 billion dollars. The basis for estimation of cost savings is discussed on Page 9 of this report.

During fiscal year (FY) 96, the SITE Program reviewed its approach to doing business and determined that operational shifts in the program were necessary to identify and assist in the development of the most sought-after technology types and treatment methods. Building on the strengths of the existing program, such as demonstration design, quality assurance, and technology transfer, the SITE Program has established a remediation problem focus that is driven by the needs of the hazardous waste remediation community. The SITE Program has the following four operating functions:

- (1) program planning
- (2) matching priority sites with innovative cleanup solutions
- (3) technology field demonstrations
- (4) information dissemination.

The SITE Program's vision is to remain the premiere organization in enhancing the credibility and implementation of effective innovative remediation options.

The SITE Program continues to earn increased recognition as a leader in advancing innovative technology development and commercialization. The program is participating with 146 remediation technology vendors. Through FY 00, the SITE Program has successfully demonstrated 121 technologies, 13 of which were demonstrated during FY 00. Emphasis formerly placed on technologies requiring the removal of soil or groundwater (ex situ) is gravitating to in situ technologies that treat contamination in place. The SITE Program recognized this change and has emphasized the development of in situ technologies. Of the 24 ongoing remediation technology demonstrations, 22 are in situ. SITE's Monitoring and Measurement Technologies (MMT) Program has completed 45 projects to date, with 6 more in the planning stages. The Emerging Technology Program has completed 73 projects.

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To ensure that the program continues to meet the needs of the remediation community, the SITE Program established a remediation stakeholder group. This group, which is composed of such agencies as the Department of Defense and the Department of Energy, reviews innovative technology applications and develops an environmental emphasis area list, which ensures that the most pressing issues are prioritized and addressed. An example of multi-agency cooperation is the Cape Canaveral Demonstration Project. This project will evaluate the effectiveness of three in situ innovative remediation technologies for remediation of dense non-aqueous phase liquids (DNAPL) in the subsurface. Two of these technologies have been demonstrated with the third currently being evaluated.

SITE's MMT Program is also addressing issues in the remediation community, and has identified a need for more effective methods to evaluate sediment and soil contamination. In response to this need, the MMT Program conducted demonstrations of two innovative sediment sampling technologies in FY 00. The MMT Program is now addressing a similarly difficult problem in evaluating the performance of field total petroleum hydrocarbon (TPH) analysis technologies. Through such relationships with other interested parties, the SITE Program continually pursues opportunities to conduct cooperative technology demonstrations, thereby reducing expenditures and further promoting innovative technologies. These factors assist the SITE Program in attaining its primary goal – the expedited cleanup of the nation's most contaminated sites.