

DOE Research and Development Portfolio

Environmental Quality

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U.S. Department of Energy



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To meet the Department of Energy's commitments to the American public, our investments in Environmental Quality are focused on advancing our scientific understanding and providing new technology to aggressively clean up the environmental legacy of our nuclear weapons programs, minimize future waste generation, safely manage nuclear materials, and permanently dispose of the nation's radioactive waste.

Over the past two years, the Department has undertaken a major effort to ensure that our research and development programs are balanced and that our Federal investments are appropriately aligned with the needs of the nation. To do this, we have instituted a new portfolio approach to managing our research and development activities. This provides, for the first time, a clear single-source description of the Department's entire research portfolio of over \$7 billion. Attached is DOE's Environmental Quality R&D Portfolio, Volume II of the Department's five-volume research and development portfolio.

This document is intended to help: (1) describe our current research and development activities and showcase our recent accomplishments; (2) increase the impact of our science and technology investments in terms of reduced cost, improved safety, and enhanced cleanup; (3) make investment decisions that ensure the Department can meet its regulatory commitments; and (4) improve our planning to achieve the portfolio balance needed to meet the nation's long-term needs.

The investments presented in the Environmental Quality R&D Portfolio are an absolutely essential, albeit relatively small, part of the Department's total investment in research and development. These investments have already provided, and will continue to provide, the scientific knowledge and new technologies necessary to meet the Department's regulatory commitments and reduce the cost of the complex-wide cleanup effort. In addition, these investments provide a small, but vital, seed corn in helping the country achieve sustainable development while improving environmental quality. It is our hope that this document communicates both the basis for these investments as well as the highly focused approach we are taking to solve some of the nation's most technically challenging, intractable environmental problems.



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Foreword

Environmental Quality is the Department of Energy's largest mission, accounting for over \$7B of DOE's \$19B budget in FY 2001. The Department is making significant progress in meeting its responsibilities for cleaning up the environmental legacy of the cold war nuclear weapons production program. In order to meet our cleanup goals while continuing to protect the environment, worker safety, and community health, the Environmental Quality program has an aggressive R&D component.

This Environmental Quality Research and Development Portfolio describes the Department of Energy investments in science and technology required to help clean-up the thousands of sites across the country that were contaminated as a consequence of building our nation's nuclear weapons. The Portfolio provides a look at the Department's investments from 1999 through the year 2001. It describes the major technical challenges in radioactive waste management, disposition and environmental restoration that our nation faces and the specific Department of Energy research and development activities being undertaken to address them.

The Portfolio correlates the R&D investments with the high-risk, high-cost, and long-term cleanup problems that are currently encountered in cleanup activities across the DOE complex. Chapter 2 provides an analysis of the Environmental Quality portfolio including discussions of the uncertainties and other factors affecting research and development, the distribution of investments by investment areas, the correlation of investments with life-cycle costs associated with the cleanup problems, and the trends in funding levels and distribution of investments from basic research through deployment of technologies. Chapters 3 through 10 (High-Level Waste through Basic Research) describe the background and specific details of each problem area and how specific R&D investments are being undertaken to meet the Department's environmental quality strategic goals and objectives. Each of these Portfolio chapters further defines the national context and drivers, strategic goals and objectives, uncertainties, investment trends and rationale, federal role and key accomplishments for each technical challenge.

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