

April 1999

NUCLEAR WASTE

DOE's Accelerated Cleanup Strategy Has Benefits but Faces Uncertainties



**Resources, Community, and
Economic Development Division**

B-282300

April 30, 1999

The Honorable John R. Kasich
Chairman, Committee on the Budget
House of Representatives

Dear Mr. Chairman:

The U.S. Department of Energy (DOE) is responsible for the world's largest environmental cleanup program. Decades of nuclear weapons production has left a legacy of radioactive, chemical, and other hazardous wastes to be cleaned up at sites across the United States. In 1989, DOE established the Environmental Management program to address the cleanup of these wastes. Eleven of DOE's field offices throughout the country manage this cleanup for the program. In the past, this cleanup has been expensive and slow, and has been criticized as lacking in commitment and accountability. In response to these criticisms, in 1996 DOE embarked on a new strategy to accelerate the cleanup and reduce the costs at its 53 remaining contaminated sites. DOE laid out its strategy in a document called Accelerating Cleanup: Paths to Closure, issued in June 1998. The Paths to Closure report provides an overview of the cost, schedule, and scope of work to be accomplished on 353 individual projects at these sites. DOE set a goal of cleaning up 41 of the remaining 53 contaminated sites by 2006. DOE estimates that the planned cleanup activities during this time will require \$57 billion. However, cleanup will not be finished at all sites by 2006, and some cleaned-up sites will require long-term monitoring. Therefore, DOE also estimates that the total cost for all cleanup activities, including the long-term monitoring of the sites, will amount to \$147 billion through 2070.¹ DOE plans to update the Paths to Closure report annually.² The next Paths to Closure report, scheduled to be issued in June 1999, will be updated based on project information submitted in April 1999, along with information from DOE's fiscal year 2000 budget request.

Because the Paths to Closure report is based on data that also serve to form DOE's annual budget request, you asked that we provide information on the (1) methodologies and assumptions used to develop the Paths to Closure report and any associated limitations, (2) uncertainties in the Paths to Closure report that may affect its usefulness, and (3) funding

¹The estimate is in constant 1998 dollars.

²Paths to Closure was first issued as a discussion draft in June 1997. Comments received on this draft were incorporated into a draft issued for public comment in February 1998. The final document, issued in June 1998, incorporates stakeholder comments from regulators, local citizen groups, and tribal nations.

implications related to the cost of cleanup. On February 19, 1999, we briefed your staff on the results of our work and agreed to provide you with this report summarizing our findings.

Results in Brief

DOE's Paths to Closure report is an improvement over earlier planning efforts. While it is an improvement, we identified limitations in the methodology and assumptions that may affect the reliability of the data; uncertainties, in such areas as the level of site cleanup and the sites' ability to meet cleanup schedules, that could cause cost and schedule estimates to be revised; and challenges that DOE may face in achieving its goals at the annual funding level targets.

To develop the Paths to Closure report, DOE's Office of Environmental Management issued guidance in October 1997, requiring its field offices to develop, by project, estimates of the cleanup work to be accomplished, the schedule to be achieved, and total—or life cycle—costs to complete the cleanup work.³ The guidance also provided each field office with an estimated annual funding allocation for cleanup activities through 2006. The Paths to Closure report is an improvement over previous efforts because, for the first time, DOE set goals for completing the cleanup at each site, used project-specific data in estimating cleanup costs, and surfaced issues needing resolution, such as where certain wastes will be disposed. However, DOE headquarters did not specify a standard methodology to be used for estimating cleanup costs, leaving field offices to select their own approaches for developing their estimates. As a result, the data from some of the sites may not be comparable or reliable. According to a recent report by DOE's Office of the Inspector General, a number of the projects' cost estimates they examined were not supported or complete. DOE has some initiatives under way to improve data quality for the next Paths to Closure update.

A number of uncertainties regarding the information in the 1998 Paths to Closure report, particularly in the sites' cost and schedule estimates, affect the report's usefulness. For example, many field offices based their cost estimates on assumed cleanup levels that have not yet been agreed to by the regulators involved—the U.S. Environmental Protection Agency and the states. If the levels eventually agreed to are stricter than assumed, both costs and schedules could increase. Cost and schedule estimates could

³Sites' life cycle cost estimates were to include the sum of the cost estimates of all the activities required to clean up the site, including the costs for storage, treatment, and disposal of wastes; facility and other infrastructure construction and decommissioning; and long-term surveillance and monitoring activities through 2070.

also be revised as the cleanup technologies to be used are identified. Some sites may also need to revise their estimates because of difficulties in completing their cleanup work by their closure dates. Finally, Paths to Closure contains only a limited discussion of activities that will be required after a site closes, such as long-term surveillance and maintenance. These costs are expected to be substantial at some sites, and are not included in some sites' cost estimates, even though sites were directed to do so.

DOE also faces a number of challenges to achieving its Paths to Closure goals at the \$5.75 billion annual funding level target identified in the report. The sites' estimates of their funding needs for fiscal years 1999 through 2006 exceed the funding level target by more than \$4 billion, or by an average of about \$500 million per year. DOE's Paths to Closure guidance established cost reduction goals for each field office to help address this funding gap, but most of the sites we contacted had not identified specific strategies for achieving the cost reductions. In addition, as our past work has shown, DOE's projects tend to take longer and cost more than anticipated. Moreover, if some of the cleanup activities that were assumed to be outside the scope of Paths to Closure are ultimately included in the Environmental Management program, costs would grow. For example, Paths to Closure notes that an additional \$8.1 billion could be needed to address any new waste generated after fiscal year 2000, a cost that was not included in the report's \$147 billion total cost for all cleanup.

Background

DOE has a complex of 113 sites around the country that were contaminated by nuclear weapons production and by research and testing activities. In 1989, DOE established the Environmental Management program to address the cleanup of the radioactive, chemical, and other hazardous wastes at these sites. Eleven field offices throughout the country manage this effort. At the end of fiscal year 1997, DOE had 53 of its 113 sites left to clean up. DOE's cleanup program has received considerable criticism about its high cost and slow progress.

In response to these criticisms, in 1996 DOE began to systematically define the technical scope, schedule, and costs of cleaning up the radioactive, chemical, and other hazardous wastes at its contaminated sites. DOE laid out its new strategy in a document called Accelerating Cleanup: Paths to Closure in June 1998. Through the Paths to Closure report, DOE hoped to challenge its 53 remaining contaminated sites to develop more efficient ways to conduct their cleanup work in order to accelerate site closure,

thereby reducing the overall costs of the program. In the Paths to Closure report, DOE set a goal of cleaning up 41 of its 53 remaining contaminated sites by 2006.⁴

DOE included two estimates in the Paths to Closure report. One covers the period through fiscal year 2006 and forecasts that \$57 billion will be required for cleanup activities during that time. The cost to clean up the 41 sites DOE hopes to complete by the end of fiscal year 2006 represents a small fraction of this estimate—about \$5 billion. For the remaining 12 sites that will complete their cleanup later (from 2007 through 2050), approximately \$46.3 billion was allocated for their cleanup activities through 2006.⁵ These 12 sites include DOE's largest and most difficult cleanup sites. The second estimate includes all DOE planned cleanup actions and site surveillance and monitoring costs through 2070 and amounts to \$147 billion.

Paths to Closure Has Strengths, but Data Reliability Questions Remain

Paths to Closure was developed using information provided by DOE's field offices that was based on guidance and DOE-wide assumptions provided from headquarters. The Paths to Closure report is an improvement over previous planning efforts because it sets goals for completing cleanup work at each site. However, the guidance from headquarters to the field offices on collecting cost and schedule information did not specify how to develop that information. As a result, field offices used varying methodologies to develop the information, raising concerns about the reliability of the data. A February 1999 report by DOE's Office of the Inspector General found that a number of the projects' cost estimates were not supported or complete. DOE has some initiatives under way to address the data reliability issues for the next Paths to Closure report.

To develop the Paths to Closure report, DOE's Office of Environmental Management issued guidance in October 1997 requiring field offices to develop, by project, estimates of the work to be accomplished, schedules to be achieved, and total—or life cycle—costs to complete the cleanup work at their sites. The guidance also provided each field office with an estimated annual funding allocation. If a gap existed between a field office's estimated funding needs and the estimated funding allocation in the guidance, the field office was to identify ways to do work more

⁴The Paths to Closure report shows the Rocky Flats and Fernald sites closing after 2006. DOE indicated that it is committed to accelerating the closure of these two sites to 2006 and 2005, respectively.

⁵The remaining \$5.7 billion of the \$57 billion is identified as being needed to fund headquarters and DOE-wide programs through fiscal year 2006.

efficiently to close that gap. For example, if a field office estimated needing \$1 million annually to fund its cleanup work, but was given an estimated funding allocation of \$750,000, the field office would need to develop strategies to achieve its scope of work at the lower funding level.

The guidance also provided DOE-wide assumptions that the field offices were to use in developing the cost and schedule estimates for their projects. For example, field offices were to assume, among other things, that (1) DOE's cleanup activities would be funded at \$5.75 billion annually, with each field office receiving a set amount; (2) the Waste Isolation Pilot Plant would open in fiscal year 1998 to allow sites to dispose of certain radioactive wastes;⁶ (3) DOE's Environmental Management cleanup program would accept no waste generated by other DOE programs after fiscal year 2000; and (4) DOE's Environmental Management cleanup program would encompass only the facilities currently in its inventory and would not be responsible for additional facilities from other DOE program areas. The guidance also provided instructions for developing waste disposition maps, that is, graphical representations of each site's conceptual approach to managing its wastes through storage, treatment, and disposal. Sites made their own assumptions about such matters as the standards the sites' cleanup would eventually meet; where waste would be shipped, if removed from the site; and what cleanup technologies would be used.

One of the strengths of the report is that, for the first time, DOE set goals for closing sites and completing the cleanup work. Under Paths to Closure, sites have organized their cleanup work into definable scopes of work, or projects, and established site-by-site, project-by-project projections of the technical scope, cost, and schedule required to complete all of the cleanup work. The strategy has also helped to identify issues that will need to be resolved before sites can close, such as technology needs, and how and where waste will be disposed. Sites that we contacted also said the Paths to Closure report was a useful tool to communicate the sites' vision of their cleanup plans to stakeholder groups, such as regulatory agencies and local citizens groups. Finally, improvements are being planned for the 1999 Paths to Closure report. For example, sites are to explain any differences in performance from their previous year's estimates. In addition, DOE intends the annual Paths to Closure report to provide a basis for its

⁶The Waste Isolation Pilot Plant is a deep geologic repository for the disposal of certain radioactive wastes. It is located in an underground salt formation near Carlsbad, New Mexico.

performance measure evaluations under the Government Performance and Results Act.⁷

DOE's guidance to field offices on the cost and schedule information they were to supply did not provide a standard methodology for developing the information. DOE officials told us the field offices did not use a consistent set of methodologies for developing their estimates. They said that some sites are more advanced in developing projects' cost estimates, while other sites are at a lower level of sophistication. This raises a concern about the reliability of the data for some of the sites. At one site we contacted, for example, officials were unable to provide documentation showing how their projects' cost estimates had been derived. They said they had relied, in part, on their experience and professional judgment to define the projects' costs and scope of work.

The reliability of the projects' cost estimates was also a point of concern in a report issued in February 1999 by DOE's Inspector General's office.⁸ The Inspector General found that the cost estimates for 7 out of the 28 projects examined had inadequate or no support. The Inspector General found instances in which DOE either could not determine the method that was used to create the estimate or the support that was provided differed materially from the estimate in the Paths to Closure report. In addition, the Inspector General found valid costs that had been excluded from some projects' cost estimates—such as those for long-term surveillance and monitoring and security—and costs that should not have been included, such as for waste generated in the future that may not be the responsibility of the cleanup program. These findings caused the Inspector General to conclude that there were material weaknesses with the process DOE used to develop and validate the cost estimates. The weaknesses were serious enough for the Inspector General to issue a qualified opinion on DOE's financial statement for fiscal year 1998.

DOE has begun to take steps to improve the quality of its data. The updated guidance, issued in December 1998 for the 1999 Paths to Closure report, requires field offices to provide more detailed information on projects' costs. For example, the field offices are to explain differences between last year's cost and schedule estimates and this year's. In addition, the updated guidance requires more information on the potential cost impacts

⁷The Government Performance and Results Act of 1993 requires federal agencies to prepare annual performance plans identifying goals for their program activities and measuring their success in meeting those goals.

⁸The Inspector General has been examining DOE's financial statements for fiscal years 1997 and 1998. This effort resulted in report DOEMG-FS-99-01 (Feb. 1999).

of additional surplus facilities that may be transferred to the cleanup program; on the costs for a range of possible levels of site cleanup, for sites for which cleanup levels are uncertain; and on the long-term surveillance and maintenance costs for cleaned-up sites. As well as requiring more detailed information, the new guidance requires the field offices to submit information to support not only the Paths to Closure report but also a new DOE management data system called the Integrated Planning, Accountability, and Budgeting System, which DOE expects to have in operation by fall 1999. According to DOE, the primary goal of the new system is to integrate formerly independent pieces of planning, accountability, and budgeting functions into one system, thereby achieving better data consistency. The Inspector General's report also noted that DOE is pursuing strategies to improve its validation process for cost and schedule estimates to improve data quality.

Cleanup Uncertainties Limit Paths to Closure Information

The Paths to Closure's cost and schedule estimates for the sites are likely to be revised as more becomes known at some sites about the levels of cleanup that must be reached and the technologies to be used. Many sites do not have a final agreement with their regulators—such as the U.S. Environmental Protection Agency and the states—on what cleanup standards must be achieved. For example, a major environmental impact study is still under way at the West Valley Demonstration Project in New York that will provide a range of options to determine exactly what cleanup levels need to be achieved there. Standards could range from no further cleanup to the complete removal of contamination and the return of the site to its original condition. In addition to the uncertainties about the cleanup standards, technological advances are needed to address some cleanup problems and to meet the Paths to Closure goals. For example, no technology exists for some aspects of removing and treating the radioactive waste now in large tanks at several major DOE facilities.

The cost and schedule information in the Paths to Closure could also be affected by difficulties sites are experiencing in meeting their closure dates. For example, the 1998 Paths to Closure lists the West Valley Demonstration Project as closing in 2005. However, West Valley officials told us their closure date will be delayed to between 2008 and 2015. West Valley officials said the site's budget reduction for fiscal year 1999 had an impact on their ability to complete the cleanup projects on schedule. Officials also acknowledged that the site's environmental impact statement has not been completed, which could affect the site's cost and schedule estimates because it will determine which cleanup strategy

options will be used. In addition to delays at West Valley, two sites for which DOE has committed to accelerate cleanup activities face challenges in meeting their new closure dates. The Rocky Flats Environmental Technology Site in Colorado is trying to accelerate its closure from the baseline estimate of 2010 to 2006 by expediting several cleanup projects. However, we identified challenges that these projects face and that raised concerns about whether the site's closure can be accelerated as planned.⁹ For example, Rocky Flats has had difficulty readying some of its radioactive waste materials for removal from the site, decontamination and decommissioning are costing more and taking longer than anticipated, agreement has not been reached with the site's regulators on the use of protective barriers over portions of the site, and several types of radioactive materials and wastes have no sites willing or able to take them. Similarly, the Fernald Environmental Management Project in Ohio faces difficulty in trying to accelerate its closure from the baseline estimate of 2008 to 2005. Agreement has yet to be reached on the technology that will be used for one of the projects that Fernald officials expect to occur by 2001. If the technology selected differs from that currently assumed, the site's cost and schedule estimates could be affected.

Paths to Closure's cost and schedule information could change as more is known about the activities that will continue at sites after they are considered closed, such as long-term surveillance and monitoring activities. In some cases, these activities will continue many years after sites have been cleaned up. The 1998 Paths to Closure report provided only a limited discussion of these activities, and some sites' cost estimates did not include them. The costs for these activities are expected to be substantial at some sites. For example, we have reported that the total cost of monitoring and maintaining the Rocky Flats site after it closes through 2040 could amount to nearly \$1.5 billion, including adjustments for inflation. In the Paths to Closure report, DOE acknowledges the need for more comprehensive plans addressing its role at sites after the initial cleanup has been achieved. A DOE official told us that the agency has created a working group on long-term stewardship to address these issues. In addition, DOE's guidance for the 1999 Paths to Closure report requires field offices to provide more detailed information on the potential cost impacts of long-term surveillance and maintenance after sites are considered closed.

⁹Our report on the closure of Rocky Flats will be issued soon.

DOE Faces Significant Challenges in Achieving Paths to Closure Goals at Its Annual Funding Level Target

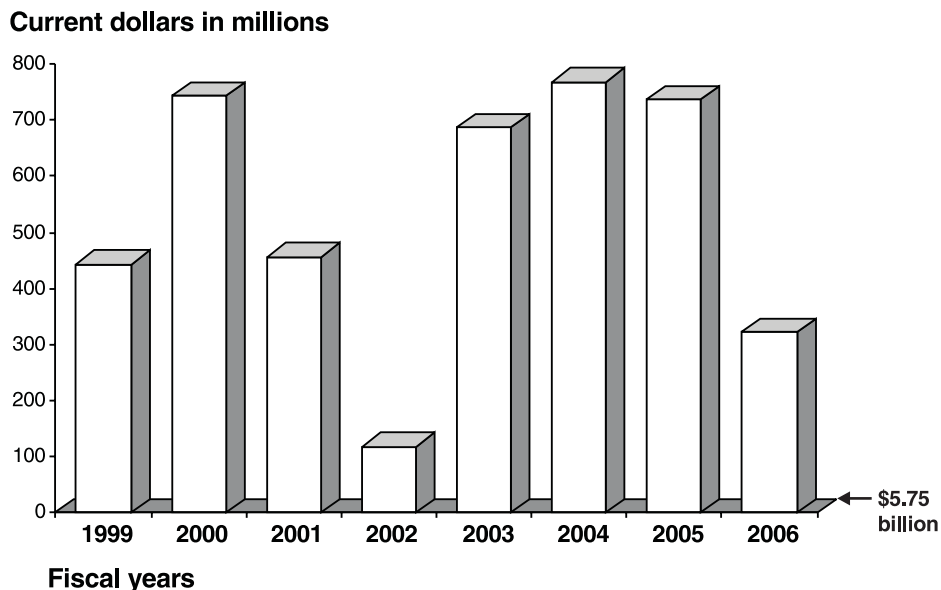
DOE's Paths to Closure report assumes that cleanup work can be accomplished with annual funding of \$5.75 billion (in current dollars). However, DOE faces significant challenges in achieving its Paths to Closure goals at this funding level. First, a funding gap exists between the \$5.75 billion funding target and the sites' identified needs. DOE also has a history of project delays and cost growth, and changes in assumptions could have an impact on the Paths to Closure report's cost estimates.

According to our analysis of DOE's data for fiscal years 1999 through 2006, the sites' estimates of their costs exceeded the \$5.75 billion annual funding target for each fiscal year.¹⁰ As shown in figure 1, the biggest gaps between sites' baseline estimates and the annual funding targets are in fiscal years 2000, 2004, and 2005, with gaps of over \$700 million (in current dollars) occurring for each of those years.¹¹ The total gap in funding for fiscal years 1999 through 2006 is \$4.3 billion (in current dollars), or an average of over \$500 million per year. To close this funding gap, DOE assumed that sites would develop strategies through fiscal year 2006 to accomplish the required cleanup work at a lower cost. However, most of the sites we contacted did not have specific plans for meeting those enhanced performance goals.

¹⁰In Paths to Closure, DOE also acknowledges a funding gap exists between the \$5.75 billion annual funding target and the requirements to meet sites' compliance agreements and other commitments. DOE estimates the gap between the two at \$3.9 billion (in constant 1998 dollars) between 1999 and 2006.

¹¹Sites' cost estimates include privatization costs. DOE's privatization strategy relies on the use of competitively awarded fixed-price performance contracts through which DOE purchases waste cleanup services from private contractors. Although under privatization DOE does not pay until these services are delivered, funds set aside each year to pay for these contracts are part of DOE's annual budget request.

Figure 1: Amount That the Projects' Cost Estimates Exceed the Annual \$5.75 Billion Funding Target



Note: Data were obtained from the cost estimates DOE used in developing the 1998 Paths to Closure report. Amounts contain privatization estimates.

DOE's history of cost increases and delays in its cleanup projects will also challenge the agency's ability to achieve the goals and milestones in Paths to Closure. Our previous work has found cost overruns and delays in several major DOE projects.¹² For example, in July 1997, we reported that DOE's Pit 9 project, involving the cleanup of an inactive waste disposal pit at the Idaho National Engineering and Environmental Laboratory, was at least 26 months behind the original schedule and could potentially cost well over twice its original estimate of \$200 million. Similarly, in May 1998, we reported that the Hanford Spent Fuel Storage project, involving the retrieval and storage of deteriorating nuclear fuel rods currently stored in water basins at DOE's Hanford Site in Washington State, was over 4 years behind the original schedule and had almost doubled in cost to about \$1.4 million.

¹²Nuclear Waste: Department of Energy's Project to Clean Up Pit 9 at Idaho Falls Is Experiencing Problems (GAO/RCED-97-180, July 28, 1997); Nuclear Waste: Management Problems at the Department of Energy's Hanford Spent Fuel Storage Project (GAO/T-RCED-98-119, May 12, 1998).

Finally, DOE's ability to achieve the Paths to Closure goals could be affected if the assumptions used to develop the report change. This could add to field offices' funding needs. For example, DOE acknowledges in the report that \$8.1 billion could be added to the Paths to Closure life cycle estimate if the responsibility for waste generated after fiscal year 2000 is kept in the cleanup program instead of being transferred to other DOE programs responsible for generating the waste. Similarly, Paths to Closure identifies another \$8.7 billion that could be added to the life cycle estimate if the cleanup program is given the responsibility for additional surplus facilities.

Agency Comments and Our Evaluation

We provided a copy of this report to DOE for its review and comment. DOE raised concerns that our report understated the benefits of the Paths to Closure strategy and focused too much on its limitations, which, it said, are minor in comparison. Our report identifies a number of strengths and benefits of the Paths to Closure document and acknowledges that it is an improvement over prior planning efforts. However, part of our objective was to provide information on the limitations and uncertainties that affect the usefulness of the Path to Closure report. In our view, it is important for readers of Paths to Closure to keep the limitations and uncertainties in mind when using it for decision-making purposes. Nevertheless, we made changes to our report and its title to better recognize the benefits of the Paths to Closure strategy. The full text of DOE's comments and our response is in appendix I.

Scope and Methodology

To identify concerns with the methodologies and assumptions used to develop the Paths to Closure report, we (1) interviewed DOE officials with responsibility for preparing the report and for the budget for the cleanup program and (2) reviewed Paths to Closure documentation, including the 1998 national report and site-specific reports, the guidance for developing the 1998 report, and the current guidance for developing the June 1999 update. To identify limitations on the usefulness of the Paths to Closure report, we reviewed the document, contacted officials at 12 DOE cleanup sites,¹³ and reviewed the stakeholders' comments on the February 1998

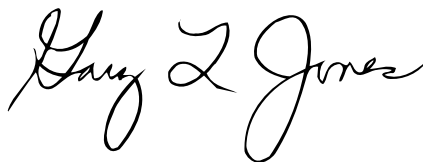
¹³These sites were the Hanford Site (Washington), Rocky Flats Environmental Technology Site (Colorado), West Valley Demonstration Project (New York), Portsmouth Gaseous Diffusion Plant (Ohio), Fernald Environmental Management Project (Ohio), Miamisburg Environmental Management Project (Ohio), Brookhaven National Laboratory (New York), Lawrence Livermore National Laboratory (California), Columbus Environmental Management Project - King Avenue (Ohio), Columbus Environmental Management Project - West Jefferson (Ohio), Rulison (Colorado), and Weldon Spring Site (Missouri). In selecting sites to contact, we obtained a mix of large sites (in terms of budget and number of projects) and small sites, many of which are scheduled to be closed by 2006.

Paths to Closure draft. To obtain budgetary information, we obtained and analyzed funding data from DOE's project baseline database. We conducted our review from October 1998 through April 1999 in accordance with generally accepted government auditing standards.

As agreed with your office, unless you publicly announce its contents earlier, we plan no further distribution of this report until 14 days from the date of this letter. At that time, we will make copies of this report available to the Honorable Bill Richardson, Secretary of Energy, and the Honorable Jacob Lew, Director, Office of Management and Budget. Copies will be made available to others on request.

If you have any questions or need additional information, please contact me on (202) 512-3841. Major contributors to this report were Chris Abraham, Dwayne Curry, Rachel Hesselink, Nancy Kintner-Meyer, Tom Perry, and Glen Trochelman.

Sincerely yours,

A handwritten signature in black ink that reads "Gary L. Jones". The signature is written in a cursive style with a large, stylized "G" and "J".

(Ms.) Gary L. Jones
Associate Director, Energy,
Resources, and Science Issues

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Abbreviations

DOE Department of Energy

Comments From the Department of Energy

Note: GAO comments supplementing those in the report text appear at the end of this appendix.



Department of Energy

Washington, DC 20585

APR 1 1999

Ms. Gary Jones
Associate Director, Energy
Resource and Science Issues
General Accounting Office
Washington, D.C. 20548

Dear Ms. Gary Jones:

Thank you for the opportunity to comment on the draft report entitled Nuclear Waste: DOE's Accelerated Cleanup Strategy Has Limitations (GAO/RCED-99-129). We have three major concerns with the report as drafted. First, the draft significantly understates the value of *Paths to Closure* in providing the first ever, site-by-site, project-by-project projection. Second, the draft does not adequately acknowledge the known data issues and positive steps EM is taking to address the data issues. Finally, the draft understates the value of *Paths to Closure* in the preparation and review of EM budget formulation and request activities.

There have been several major programmatic achievements associated with development of the *Paths to Closure* report that have not been adequately noted in the draft which include:

1. The report provides a vision to cleanup as many of DOE sites as possible by 2006. This vision will drive budget decisions, the sequencing of projects, and the actions needed to meet program objectives.
2. For the first time EM projected site-by-site, project-by-project projections of the technical scope, cost and schedules required to complete all 353 projects at DOE's remaining cleanup sites.
3. The report identifies the challenges, including technical, funding and political, that must be addressed to meet the schedules contained in the report.
4. Provides a basis to evaluate EM's annual budget in the context of long-term cleanup and closure requirements and projections. Costs and metric data (cubic meters of waste to be treated, number of release sites, etc.) can now be given as a percentage of total costs and total amount of work to be performed.

See comment 1.

Appendix I
Comments From the Department of Energy

5. The budget was restructured to meet the goals and objectives contained in *Paths to Closure*, allowing focus on accelerating closure of the sites.
6. Provides a response to the concerns of stakeholders, regulators, and Tribal nations regarding the need to more clearly define the scope and management approach EM is taking in regard to its cleanup effort.

These benefits are almost ignored in the draft GAO report. Further, whenever the report does mention a potential benefit, the draft immediately gives a “however” statement that is often unrelated or is comparatively minor in terms of the benefit.

See comment 2.

While not numbered in the draft report, we found 5 areas that are described as “limitations” that need to be clarified. First, the draft states that DOE did not specify guidance to the sites to estimate cleanup costs, when in fact EM issued a very voluminous guidance document to the Field Offices. The approach taken was to include a comprehensive set of cost and metric data to be prepared by each site. Specific cost guidance along with baseline development guidance was provided in section 7.1 of the October 20, 1997, guidance package. Additional baseline development guidance was provided in attachment J. EM intentionally did not prescribe an overly detailed set of cost and baseline development criteria in order to permit the sites the flexibility needed to prepare life-cycle cost estimates based on their unique set of cleanup problems, unique set of regulatory requirements, and the unique set of stakeholder preferences that exist at each site.

See comment 3.

Second, the draft references a recent report by DOE’s Inspector General that 7 of 24 projects they examined were not supported or complete. We acknowledge the weaknesses in those projects and are taking steps to improve the data in those projects in next years’ version of *Paths to Closure*. We do not believe that identified weaknesses in 7 projects is an adequate base to draw wide spread conclusion on all 353 projects.

See comment 4.

Third, the draft concludes that basing cleanup cost estimates on assumed cleanup standards is a “limitation.” We strongly disagree. The *Paths to Closure* report describes in great detail the decision making process that EM must follow in establishing cleanup standards. For many of our sites cleanup is not expected to be completed for 40 to 50 years in the future. It is unreasonable to expect DOE or its regulators to decide cleanup standards that far in the future. Rather, the rational approach used in long term planning initiatives is to agree on a planning cleanup standard, estimate scope, cost, and schedule based on that assumption,

Appendix I
Comments From the Department of Energy

and revise the estimates as we and the regulators ultimately make decisions. The choice of assumed standards was, however, discussed with our regulators and stakeholders and found acceptable for planning purposes. In short, there is no other way to prepare life cycle cost estimates.

See comment 5.

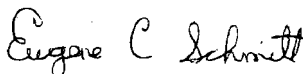
Fourth, the draft report states that *Paths to Closure* contains only a limited discussion of activities that will be required after a site closes. We agree and will include more comprehensive data in future versions of *Paths to Closure*. However, the draft report is not accurate in stating that these costs are expected to be substantial. *Paths to Closure* included about \$4 billion in long term surveillance and maintenance costs. While this represents only 50% of the DOE sites, it is not significant in comparison to the \$147 billion total cost estimate.

See comment 6.

Finally, the draft report factually restates information from *Paths to Closure* on the funding challenges EM faces in meeting the projected schedules. The *Paths to Closure* report provides extensive discussion on this concern to guide us and the Congress on the potential impact of budgetary decisions. Since there is nothing new in this section of the draft report it should not be considered a "limitation" of *Paths to Closure*.

See comment 7.

In conclusion we believe the congress would be better served if GAO would restructure the draft report to clearly separate the benefits and weaknesses of the *Paths to Closure* planning process and retitle the report "*DOE's Paths to Closure: Strengths and Weaknesses.*"


for James M. Owendoff
Acting Assistant Secretary for
Environmental Management

GAO Comments

The following are GAO's comments on the Department of Energy's letter dated April 1, 1999.

1. DOE's comments provided a list of benefits of the Paths to Closure strategy. We acknowledged in our report that Paths to Closure has strengths and pointed out many of the same benefits that DOE listed in its comments. For example, we noted that, under Paths to Closure, DOE has for the first time set goals for completing the cleanup at each site and has surfaced challenges that need to be addressed to achieve those goals. Part of our objective was to provide information on the limitations and uncertainties in the Paths to Closure report. In doing this, we pointed out limitations and uncertainties of the report's information that are important for a reader to keep in mind in using this document. In describing both the strengths and limitations of the Paths to Closure report, we identified the underlying issues that need to be considered when using Paths to Closure's information for decision-making purposes. Nevertheless, we made changes to our report to better recognize the benefits of the Paths to Closure strategy.

2. While DOE provided guidance on the cost and schedule information field offices should submit, no standard methodology for estimating projects' costs was specified. The guidance DOE cited in its letter says only, sites should use "an appropriate activity based cost estimating methodology." As we pointed out in our report, some sites were less experienced than others in preparing cost estimates, including developing and using cost estimating techniques. We revised the report to clarify that DOE headquarters did not specify a standard methodology that sites should use for estimating cleanup costs.

3. The Inspector General's findings involving the seven projects caused the Inspector General to conclude that there were material weaknesses with the process DOE used to develop and validate the cost estimates. The weaknesses cited by the Inspector General were serious enough for that office to issue a qualified opinion on DOE's fiscal year 1998 financial statement. DOE concurred with the report's recommendations and indicated that it was actively working to improve the quality of the process for estimating environmental liabilities. In light of that and our own review, we believe that the reliability of the cost estimates in Paths to Closure is a limitation that needed to be raised. In addition, DOE noted in Paths to Closure that numerous stakeholders had raised concerns about the quality of the data when commenting on the February 1998 Paths to Closure draft. DOE said—and we pointed out in our report—that the

agency is planning to take steps to improve the quality and consistency of the data. We added information to our report to clarify aspects of the Inspector General's findings and the activities that DOE is planning.

4. We agree that when cleanup standards are not known, cost estimates can only be based on assumptions. However, as we stated in our report, these assumptions are uncertainties that will likely result in the Paths to Closure cost and schedule estimates being revised as more becomes known. In addition, the majority of DOE's sites—41 of 53—are scheduled to be closed by 2006, not in 40 or 50 years as DOE states in its letter. Some sites—due to finish their cleanup work in less than 7 years—are still negotiating their cleanup levels. We cited the West Valley Demonstration Project, due to close by 2005, as an example of one of the sites for which the level of cleanup to be achieved is still being negotiated and could range from no further cleanup to much stricter standards. Site estimates will likely be revised as cleanup levels are agreed to. Therefore, we noted such situations as an uncertainty in the Paths to Closure estimates and made no changes to our report as a result of DOE's comment on this point.

5. As DOE points out, the \$147 billion life cycle estimate includes an estimated \$4 billion in costs associated with activities that will be required after a site has completed its cleanup work. In addition to this amount, one site we contacted estimated its long-term costs at more than \$1.5 billion. These costs were not included in its Paths to Closure estimate. In total, this represents more than \$5.5 billion in long-term costs for about 50 percent of DOE's sites, a figure that is likely to be higher once estimates from all of the sites are included. While these costs will be spread over a 20- to 30-year period, we believe that \$5.5 billion is a significant cost. We made no changes to our report as a result of DOE's comments on this point.

6. As DOE acknowledges, it faces challenges in trying to meet the Paths to Closure goals with a \$5.75 billion annual funding target. In addition to the challenges of closing the funding gap between the sites' needs and the annual funding target described by DOE in Paths to Closure, we provided information in our report on other challenges, such as overcoming the tendencies toward delays and cost increases that major DOE projects have historically experienced. Because these challenges have potential budget implications, we pointed them out as limitations that a reader needs to keep in mind in understanding the costs of the cleanup program. We made no changes to our report as a result of DOE's comments on this point.

7. We were asked to focus on the limitations and uncertainties of the Paths to Closure report that affect its usefulness. Although that was our focus, we also reported on the strategy's strengths. We have changed the title of our report to better express this message.

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