

**A REVIEW OF DEPARTMENT OF ENERGY'S RADIO-  
ACTIVE HIGH-LEVEL WASTE CLEANUP PRO-  
GRAMS**

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**HEARING**  
BEFORE THE  
SUBCOMMITTEE ON  
OVERSIGHT AND INVESTIGATIONS  
OF THE  
COMMITTEE ON ENERGY AND  
COMMERCE  
HOUSE OF REPRESENTATIVES

ONE HUNDRED EIGHTH CONGRESS

FIRST SESSION

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# **A REVIEW OF DEPARTMENT OF ENERGY'S RADIOACTIVE HIGH-LEVEL WASTE CLEAN- UP PROGRAMS**

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**THURSDAY, JULY 17, 2003**

HOUSE OF REPRESENTATIVES,  
COMMITTEE ON ENERGY AND COMMERCE,  
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS,  
*Washington, DC.*

The subcommittee met, pursuant to notice, at 9:35 a.m., in room 223, Rayburn House Office Building, Hon. James C. Greenwood (chairman) presiding.

Members present: Representatives Greenwood, Walden, Deutsch, DeGette, and Rush.

Staff present: Dwight Cates, majority professional staff member; Peter Kielty, legislative clerk; Sue Sheridan, minority counsel; and Bruce Harris, minority professional staff member.

Mr. GREENWOOD. The committee will come to order. Welcome everyone. Good morning. The Chair recognizes himself for the purpose of making an opening statement.

Today the subcommittee will continue its ongoing oversight of the Department of Energy's environmental management program. Last year the subcommittee held a hearing on the EM program's accelerating cleanup initiative. Today we are following up with a hearing to review DOE's progress on accelerating the cleanup of high-level radioactive waste.

The Department currently estimates that \$230 billion, that is billion with a B, will be spent over the next 70 years to clean up the contamination that remains from nuclear weapons production during the cold war.

By far, the disposal of high level radioactive wastes represent the most expensive cleanup responsibilities for the Department, accounting for \$105 billion of the estimated \$230 billion in cleanup costs.

Although the cleanup program will span 70 years, near-term decisions made by the EM program as to which technologies to deploy and what facilities to design and construct will effectively commit tens of billions in taxpayer funds for high-level waste activities at the Hanford Site, the Savannah River Site, and the Idaho site.

These decisions will impact the programs for decades to come, and it is important for this subcommittee to actively review some of these decisions at the front end before the billions are committed.

Unfortunately, the subcommittee's hearing record over the last 9 years reflects a questionable track record with respect to DOE's management of large scale cleanup projects. In 1997 this subcommittee exposed the problems at the Pit 9 cleanup project at the Idaho site, where hundreds of millions of dollars were spent to construct facilities that were later determined to be useless for cleaning up the wastes.

Similarly, in 1998, the subcommittee held a hearing that was critical of DOE's far flung plan to privatize the cleanup of high level waste at the Hanford Site, using a complicated and unworkable financial arrangement with a contractor that couldn't do the job.

DOE wisely abandoned that effort, but not before several years and hundreds of millions of dollars were wasted on the project. Although DOE's track record leads me to be skeptical, it is not my intention today to embarrass the Department for mistakes it has made in the past. I believe the EM program has worked hard over the past 2 years to rein in the pattern of mismanagement we have come to know during the past decade.

Under the leadership of Secretary Abraham and Assistant Secretary Jesse Roberson, there is a new sense of a commitment to achieve real progress with site cleanup. DOE's high-level waste problem is complicated, challenging and expensive. It is critical that Congress is confident that the decisions made by the EM program will not set us on another path of cost overruns, failed technologies and billions in taxpayer funds wasted on facilities that are constructed and then later determined to be useless.

I look forward to the testimony of Assistant Secretary Roberson, as well as that of Robin Nazzaro, of the General Accounting Office. GAO has written a report on DOE's high level waste program at my request. And I also look forward to the testimony from Representatives from the State of Washington where Hanford is located, and from the State of South Carolina where Savannah River is located, to get their views on DOE's high-level waste program.

I thank all of these witnesses for appearing before us today, and with that I will recognize the ranking member for an opening statement.

Mr. DEUTSCH. Thank you, Mr. Chairman. I would like to submit a statement for the record.

Mr. GREENWOOD. Without objection that will be the order.  
[The prepared statement of Hon. Peter Deutsch follows:]

PREPARED STATEMENT OF HON. PETER DEUTSCH, A REPRESENTATIVE IN CONGRESS  
FROM THE STATE OF FLORIDA

Thank you, Mr. Chairman, for holding this hearing and also for requesting the General Accounting Office to look at the Department of Energy's latest efforts to reduce the cost of treating and disposing of the nuclear waste that resulted from this nation's nuclear weapons program—a \$100 billion-plus program for just the high-level waste alone.

This Committee have been investigating attempts by the Department to reduce costs and streamline these clean-ups for more than a decade. Each time, the Department has promised—but failed to achieve—quicker, cheaper clean-ups. Three of them come to mind. The first is Pit 9, a fixed-price contract to clean up low-level waste in Idaho that was eventually abandoned. At the Subcommittee's hearings in 1997, the project was described as being "littered with broken promises, massive schedule delays, fines, adversarial relationships, technical and management failures." It was a project in which the contractor was designing and building the

project simultaneously without determining if the design would work. The unfinished treatment building still litters the site.

The second is the In-Tank Precipitator that was supposed to clean up high-level waste at the Savannah River Plant. After \$1 billion in expenditures over a decade, it was determined that it didn't work. GAO looked at that project for this Committee also and found that one of the key reasons for this tremendous waste of money was that the contractor began building the project before the design was complete—and before anyone knew it was going to work. This contractor tried to drain more money from the Department, but its efforts finally failed.

The third project involved a “privatization” effort at Hanford to clean up the same underground tanks that we are talking about today. BNFL was going to take this technically challenging effort on with the backing of private investors, even though no one knew exactly how to clean up the waste. Not surprisingly, the private investors wanted quite a premium to take on that risk. Preliminary demonstration projects were eliminated with the result that no one knew if the technology would work. Once again, the project failed, and BNFL walked away.

The Department's latest approach may be the most creative because it relies on separating out 90 percent of the high-level waste, redefining it as low-activity waste and treating it on site. Aside from the potential legal problems, I have immediate concerns that the technology will not be fully tested until the separation facility is built. And, again, the estimated cost savings are highly questionable. GAO recommends that DOE address “management weaknesses,” but the Department, like most others, is cutting managers, not adding them.

Mr. Chairman, this entire scenario reminds me of line from the Peter, Paul and Mary song, “When will they ever learn? When will they ever learn?” It appears that not a single lesson about how to do effective and efficient clean-ups has yet to be learned by the DOE.

I am pleased to have our witnesses here today before us, so that this committee can explore how the Department of Energy intends to interpret a new US District Court ruling on reclassification, as well as its efforts to address responsible management of nuclear waste clean up.

[Additional statements submitted for the record follow:]

PREPARED STATEMENT OF HON. W.J. “BILLY” TAUZIN, CHAIRMAN, COMMITTEE ON ENERGY AND COMMERCE

Mr. Chairman, thank you for holding this important hearing.

Over the past few years, the Energy and Commerce Committee has focused its attention on the nuclear waste disposal problems at commercial nuclear power plants. In the 107th Congress, I was pleased to lead the House effort to pass the Yucca Mountain siting resolution. As you know, we passed that resolution overwhelmingly in both the House and the Senate.

This hearing is important because we also need to focus our attention on nuclear waste disposal problems at the Department of Energy. The Department's weapons production activities helped us win the Cold War. Now, the radioactive high-level wastes stored at Hanford, Savannah River, and Idaho must be dealt with.

The States and local communities where DOE's nuclear waste sites are located should expect Congress and the Department to do everything we can to reduce the risks of environmental contamination, and dispose of these wastes in a manner that fully protects human health and the environment.

However, DOE's effort to clean-up high-level wastes is not just a matter for the benefit of States and local communities surrounding these sites. It is a matter of national significance when we commit tens of billions of dollars in Federal taxpayer funds to construct and operate facilities to clean up these wastes. I expect DOE and the States will utilize a balanced approach that maximizes risk reduction while fully considering the cost of different disposal options.

This Subcommittee has demonstrated an ongoing commitment to ensuring that the billions of dollars in taxpayer funds spent by DOE's Office of Environmental Management are spent on actual cleanup. However, too often this Subcommittee has been in the position of investigating major cleanup projects after they have failed, and after hundreds of millions of dollars in taxpayer funds have been wasted.

I hope the Subcommittee will closely follow DOE's efforts to clean up its high-level wastes to ensure they are disposed of safely, and to hold the Department accountable if it begins to head down the path of more cost increases and schedule delays. High-level waste disposal is expensive, and if DOE makes the same management mistakes it has made on other cleanup projects in the past, the cost in terms of time, money, and safety will be enormous.

I thank the Chairman, and I yield back.

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PREPARED STATEMENT OF HON. JOHN D. DINGELL, A REPRESENTATIVE IN CONGRESS  
FROM THE STATE OF MICHIGAN

Mr. Chairman, I commend you for holding this hearing today. Unfortunately, we are here once again on the all-too-familiar topic of the Department of Energy's (DOE) management of its high-level nuclear waste cleanup efforts.

The question of how to properly dispose of the Nation's nuclear waste, both commercial- and defense-related, is a political thicket that has ensnared this country since the dawn of the nuclear age. On the commercial front, we have made progress, but it has been hard fought over several years. We finally have a repository site at Yucca Mountain and there seems to be a firm commitment this year from the House appropriators to allocate the necessary funding for its construction. While we must remain vigilant on this front to ensure that America's ratepayers get the service for which they have already paid, I am encouraged by our progress thus far.

Disposal of our defense-related waste is another matter indeed. Storage of such waste is primarily concentrated at three facilities in Hanford, Washington; Savannah River, South Carolina; and Idaho Falls, Idaho. DOE's record at these facilities is less than impressive. Much of this waste is stored in tanks that have well exceeded their design life and have leaked unknown amounts of highly radioactive and toxic waste into the ground and potentially the groundwater.

Today the Subcommittee is presented with yet another report from the General Accounting Office (GAO) outlining concerns with the planning and management of DOE's high-level nuclear waste program.

We learn from the GAO that the Department's latest scheme to save money and speed cleanup of this waste is bedeviled on two crucial fronts: legal and technical.

On the legal front, DOE's formula for magically transforming high-level waste into low-level or "incidental" waste was determined to be a violation of the Nuclear Waste Policy Act and thus deemed invalid by the Federal District Court in Idaho. How will DOE respond? Will the decision be appealed? Will the Department request a legislative change in the Nuclear Waste Policy Act and what would the implications be if the Act were re-opened?

On the technical front, the GAO finds that the Department is engaged in its familiar cart-before-the-horse approach on cleanup where DOE plans to employ technology without first doing the necessary testing to ensure that it will work. I note that we have been down this road before at the Savannah River site to the tune of \$500 million in wasted taxpayer money and additional delays.

With that background I cast a skeptical eye towards the Department's competence in dealing with this issue and hope that today's hearing will find some recommendations to improve this badly mismanaged program.

Mr. GREENWOOD. And we welcome our first panel, Ms. Robin M. Nazzaro, director for natural resources and environment at the General Accounting Office and Ms. Jessie Roberson, assistant secretary for environmental management, Department of Energy.

And, I am told that Ms. Roberson will go first.

Ms. ROBERSON. Thank you, sir.

Mr. GREENWOOD. I think you are both aware that this is an oversight hearing, and we take testimony under oath. Do either of you have any problems giving your testimony under oath? It is also my duty to inform you that pursuant to the rules of the Committee and the House, that you have the right to be presented by counsel. Do you wish to be represented by counsel? I didn't think so. Okay. If you would both stand and raise your right hands.

[Witnesses sworn.]

Mr. GREENWOOD. Okay. You are under oath. And, Ms. Roberson, you are recognized for your opening statement. Welcome. Thank you.

**TESTIMONY OF JESSIE H. ROBERSON, ASSISTANT SECRETARY  
FOR ENVIRONMENTAL MANAGEMENT, DEPARTMENT OF EN-  
ERGY; AND ROBIN M. NAZZARO, DIRECTOR FOR NATURAL  
RESOURCES AND ENVIRONMENT, GENERAL ACCOUNTING  
OFFICE**

Ms. ROBERSON. Good morning, Chairman Greenwood and members of the subcommittee. I appreciate the opportunity to be here today to discuss the Department's efforts to address high-level waste cleanup, and our reaction to the GAO's report on this subject. We are making progress with our high-level waste program. We have produced over 1,300 canisters of solidified glass waste at the Savannah River Site, over 25 percent of the total projected.

We have poured 275 canisters of solidified glass waste at the West Valley Demonstration Project, and are in the construction phase of the Waste Treatment Plant at our Hanford Site. However, as DOE made clear in the EM Top to Bottom Review, the cleanup of high-level waste is the single largest component in the cleanup program.

Since initiating implementation of the Top to Bottom Review, we have taken very specific and focused actions. And I believe we are moving the environmental management program in the right direction. We have taken strong and direct actions, including developing performance management plans which identified the strategies and initiatives to accelerate risk reduction in accordance with end States.

We have developed resource-loaded baselines to provide the specificity needed to implement those strategies laid out in the performance management plans. We are producing life cycle cost estimates of implementing those plans to provide the certainty needed to support the budgets that we request to carry out our work, and most importantly, we are accelerating actions on the ground even today.

Some specific accomplishments since issuing the Top to Bottom Review at Savannah River. We have reduced the high-level waste volume by over 1 million gallons, and have poured over 250 canisters since the Top to Bottom was issued.

We have replaced the melter unit at the Defense Waste Processing Facility. We did that in record time and under budget. We have developed and are using an improved glass frit, as well as increasing the amount of waste poured in each container, reducing the number of containers by about 20 percent at Savannah River.

At the Office of River Protection, we have reduced the overall tank farm volume by 3 million gallons. We have reduced the amount of pumpable liquid in single-shell tanks by over 1 million gallons, and currently at that site, we have less than 100,000 gallons in single-shell tanks and are on schedule to complete that removal from single-shell tanks by April 2004. We have removed all liquids from Tank C-106, and are in the process of removing all sludges from that tank a year ahead of schedule.

At Idaho, we have reduced overall tank farm volume to under 1 million gallons total, the lowest volume since the 1950's. We have emptied five pillar and panel tanks, cleaned and flushed two of those tanks, which are now ready for closure, and we have emptied three spent fuel pools at Idaho.

On the topic of potential savings, while there are different approaches to reporting costs, as stated in the GAO report, the cost savings we project under the most conservative approach of constant year dollars are significant; an estimated \$20 billion for the high-level waste program alone. These savings are derived using the same methodology used in the independent financial audit of the Department's environmental liabilities cost estimate.

I do not take lightly my responsibility to participate in making important decisions or providing important input to the Departmental decisions regarding public health and safety, and committing Federal funds. For example, I do not agree with the GAO finding that we did not adequately reevaluate low-activity waste treatment and disposal options at Hanford. In March 2003, I commissioned a study to evaluate various technologies for optimal treatment and disposal of low-activity waste. The study considered both the baseline approach as well as over 10 variations to that approach. It pointed us to some specific supplemental technologies to focus further development on, which we are pursuing.

Last, the GAO recommended that the Department explore alternative strategies for dealing with an adverse legal decision regarding one of the Department's orders for implementing its Atomic Energy Act responsibilities. We do agree with the GAO's recommendation on that point.

Accelerating the high-level waste program is the single most significant component of the environmental cleanup program. It makes the greatest impact on the safety and environmental profile of this program. It carries the greatest financial risk and is a pre-eminent step to fulfilling our soil and groundwater remediation at the sites where we have high-level waste stored in tanks.

Dating back to the early 1980's, DOE's approach in this program has been premised on the assumption that DOE has the authority to manage and dispose of the tank waste in a manner consistent with the risks they present. We would take the appropriate steps to reduce the radioactivity of these wastes, including residual waste, treating them so they can be safely disposed of without requiring the isolation of a deep geologic repository.

This approach is consistent with a risk-based strategy in that only wastes requiring geologic isolation based upon risk to the public and environment, are disposed of in a high-level waste geologic repository.

Much of the Department's tank waste resulted from spent nuclear fuel reprocessing activities that were performed to produce nuclear materials primarily for defense purposes. While the untreated wastes remained in our storage tanks, DOE conservatively managed them as high-level waste. Once the waste is retrieved from the tanks, DOE intended to separate the waste into a low-activity fraction for treatment and disposal as low-level waste in some cases transuranic waste, and a high-radioactivity fraction for treatment and disposal in a high-level waste geologic repository.

With this approach, DOE would employ treatment methods and dispose of low-activity tank waste as low-level waste. In fact, this approach has a long-standing technical and regulatory basis with the Nuclear Regulatory Commission from which our process was derived. Additionally there is international support for such an ap-

proach. The International Atomic Energy Agency has proposed a waste classification system in which the degree of geologic isolation of radioactive waste is based on risk rather than exclusively on the source of the waste.

Similarly, a recent publication by the National Council on Radiation Protection and Measurement proposed a unified waste classification system for both radioactive and hazardous wastes based on the risks they pose. As the GAO report states, our authority to make these determinations was challenged by several organizations in the District Court of Idaho in early 2002.

The recent court decision in the Idaho District Court could significantly hinder our ability to implement the accelerated cleanup program. I support the GAO recommendation in this regard, that Congress clarify its intent concerning the Department's authority under the Atomic Energy Act to manage the waste from its reprocessing activities.

The Department would seek from Congress the reaffirmation that the Nuclear Waste Policy Act does not mandate that the Department dispose of defense high-level waste in a geologic repository constructed under the Nuclear Waste Policy Act, and that the Department has the authority to determine which wastes from reprocessing do not require permanent disposal in a repository designed for spent nuclear fuel and high-level waste.

Accelerating cleanup by almost 20 years and saving over \$20 billion in the high-level waste program will protect public health and is a wise investment for our children's future. Thank you, sir.

[The prepared statement of Jessie H. Roberson follows:]

PREPARED STATEMENT OF JESSIE H. ROBERSON, ASSISTANT SECRETARY FOR ENVIRONMENTAL MANAGEMENT, U.S. DEPARTMENT OF ENERGY

Mr. Chairman and Members of the Subcommittee, I am pleased to be here today to discuss the Department of Energy's actions in response to the General Accounting Office Report, *Challenges to Achieving Potential Savings in DOE's High-Level Waste Cleanup Program* (GAO-03-593). I appreciate the opportunity to describe our efforts to address the largest-cost component of the Environmental Management program and the challenges and opportunities that lie before us.

In 1996, the Department achieved two very important milestones in its high-level waste program. It began immobilizing high-level waste into a safer, stable waste form at its West Valley Demonstration Project in western New York and at the Defense Waste Processing Facility at the Savannah River Site (SRS) in South Carolina, for ultimate disposal in a geologic repository. I am pleased to report that we have produced over 1,300 canisters of a solidified glass-waste product at the SRS (over 25 percent of the projected total number of canisters to be produced there), and we completed high-level waste treatment at the West Valley Demonstration Project site in New York, having poured 275 canisters of a solidified glass-waste product. We are also making good progress on construction of an extensive Waste Treatment Plant at our Hanford site, which will produce almost twice the number of solidified high-level waste canisters as the Savannah River plant. The foundations of the major facilities of the Hanford plant have been emplaced, and the building structures are visible.

Despite these successes, significant challenges remain in this program. In August 2001, Secretary Abraham directed the Department to complete a Top-to-Bottom Review of its cleanup program. The review, released in February 2002, concluded that significant change in how the Department approached risk reduction and cleanup for its sites was required. Two years ago, as costs for the cleanup program continued to increase, including those at our high-level waste sites, we estimated that it could take over \$300 billion and nearly 70 more years to complete cleanup 20 years longer than the actual operations of our oldest facilities and 25 times longer than the actual construction of our most complex facilities. We concluded that a fundamental change to how we approached, managed, and performed the entire cleanup program

was required. Last year EM started the effort to reform this massive program with an accelerated cleanup program.

Since the completion of the Review, the estimated cost to complete the cleanup program has decreased by approximately \$20 billion in the high-level waste program alone, with an attendant reduction in schedules of approximately 20 years.

In early July 2003, a significant challenge to safe and effective remediation of the Department's spent nuclear fuel reprocessing wastes became reality when the U.S. District Court for the District of Idaho invalidated certain provisions of the Department's Order for safely managing radioactive waste. These provisions are consistent with the approach DOE and NRC, and their predecessor agencies, have followed for more than 20 years in meeting their Atomic Energy Act responsibilities for safely managing the radioactive wastes resulting from spent fuel reprocessing. The Department's provisions were consistent with managing wastes according to the health and environmental risks they pose. This ruling jeopardizes the Department's ability to provide safe and cost-efficient, risk-based treatment and disposal of certain of our wastes. The GAO Report correctly identified the vulnerability caused by this litigation, which I will address in some detail later. I will begin by discussing the key GAO conclusions and recommendations from the GAO report.

#### KEY GAO REPORT CONCLUSIONS/RECOMMENDATIONS

In June 2002, the GAO notified the Secretary of their intent to conduct a review of the Department's high-level waste program, at the request of the Chairman of this Subcommittee. The GAO issued a draft report in early May 2003, and an exit briefing was conducted shortly thereafter. In early June 2003, the Department submitted its formal response to the draft report. I will address the Department's responses and corrective actions for each of the major conclusions and recommendations of the report.

*Predictions of Projected Savings in Site Performance Management Plans.* As noted in the GAO report, the four sites that manage high-level waste have each developed a Performance Management Plan, identifying key strategies, end states, program end dates, key milestones, and commitments to facilitate accelerated high-level waste cleanup and site closure. Each site developed its plan in collaboration with appropriate state and federal regulators. The GAO has expressed some concerns regarding projected savings estimates associated with the Performance Management Plans. I would like to address these concerns.

First, the GAO noted that DOE baseline costs are not fully reliable. In this regard, some of the key reforms EM has implemented are work practices requiring development of baselines and adherence to a strict configuration control process for approval of any changes to these baselines. This approach has resulted in establishing baselines for a number of key, critical program elements, including costs and schedules. I have launched a Contract Management Advisory Council to review our contracts from a more corporate perspective. Our goal is to ensure that the lessons learned, both good and bad, from all our endeavors are institutionalized into our contracts and business practices, and that we suspend those contract philosophies that do not support accelerated risk reduction and cleanup of our sites. To complement this Council, I have initiated baseline validation reviews to assess the validity of baselines for all of our major projects. These validation reviews are ongoing, and validated baselines of cleanup activities at all of our closure sites, for example, are expected to be in place by October 2003.

The GAO also criticized the Department's lack of a standard methodology for calculating potential savings. As the GAO notes in their report, DOE has recognized that it lacks standard methodologies for developing life-cycle cost baselines. One approach is to account for costs in constant-year dollars. As part of the EM environmental liability estimate used in the Department's Performance and Accountability Report and audited Financial Statement, constant-year dollars are used, and are based upon a roll-up of our Project Baseline Summaries accounts.

The GAO also noted that our current savings estimates do not appropriately account for uncertainties. As part of the Department's Financial Audit process, we do calculate uncertainty. Additionally, I have initiated strict change control and monitoring of key elements to facilitate a high confidence level that the goals and direction of the accelerated cleanup initiative are being met. We are aggressively identifying all government-furnished services and items, and tracking them to ensure key programmatic risks are resolved.

*Full Testing of Waste Separations Technologies.* The GAO criticized the lack of full testing for high-level waste separations technologies, including the absence of pre-construction integrated testing of separation steps at Hanford, in support of the design of the Waste Treatment Plant (WTP). The WTP contractor considered construc-

tion and operation of an integrated pilot plant using simulated waste. However, the information the pilot plant would provide would not be available in time to be incorporated into the plant design, unless plant design and construction were delayed several years. An alternate course was chosen with development and testing being conducted at one of our national laboratories, in which each unit operation is pilot-tested and the product and recycle streams produced are collected and process-tested in the receiving unit. This simulates the plant design in that the product from each unit operation will be collected in tanks and staged before being fed to the next unit operation. This testing will provide confidence that the process will function in an integrated manner. Further, when plant construction is completed, full-scale integrated tests will be conducted. Also, DOE and the commercial sector possess extensive experience with the planned unit operations that we believe offset some of the apparent need for full testing of waste separations technologies.

*Rigorous Analysis in Support of Key Decisions.* The GAO noted a concern with the Department's lack of commitment to re-evaluate low-activity waste treatment and disposal options at Hanford. We recently prepared a new internal study to evaluate various technologies for optimum treatment and disposal of low-activity waste. That study developed life-cycle analyses using the best available information and provided costs for each option. We analyzed and compared over a dozen combinations of low-activity waste treatment technologies. Many of the cases evaluated did not include the present vitrification system as a treatment component while others used it in combination with other approaches. The study concluded that the planned approach, which includes two low-activity waste vitrification melters, in combination with other supplemental technologies, would provide acceptable performance at the lowest life-cycle costs, if those supplemental technologies prove successful during ongoing testing with Hanford tank wastes.

*Corporate Projects and Improvements to EM Program.* The GAO reiterated its concern that there were fundamental weaknesses in DOE's project management systems, and that no management team was focused on resolving these issues. I disagree. The Top-to-Bottom Review identified unfocused and inconsistent work planning processes as the principal contributors to EM's uncontrolled cost and schedule growth. To address this failing, I formed ten special corporate projects; each assigned a specific strategic objective. One of these is focused on high-level waste and is formulating corporate level initiatives to accelerate risk reduction in a much improved, more cost-effective manner. These project teams, using project management principles, are key to improving our work planning processes and instilling rigor into our internal management decisions. They are imbuing EM with a cadre of management and staff personnel with the discipline to perform the planning, analyses, and evaluations necessary to implement actions to accelerate risk reduction and completion of the EM program.

Meaningful, lasting reform must be the result of leadership and commitment, but it must find its way into the very core of the organization to be sustained. Building a high-performing culture requires attracting and retaining talented people who deliver excellence in performance. Improving management efficiencies requires that organizations challenge, hold accountable, and reward top-performing employees. This corporate initiative does just that. These ten teams will herald a new standard of performance, innovation, and greater results for the EM program. Our goal is not just to establish performance-based contracts but to solidify a performance-based program for all who choose to have a role. I am also restructuring the EM organization to further this effort.

*Fast-Track Construction of Hanford Waste Treatment Plant.* The GAO expressed concern that the Department's design-build approach does not address risk. The WTP costs changed, in part, because of the Department's initiative to accelerate risk reduction and mission completion and to reduce overall costs. Rather than initially build a low-capacity plant followed by a second higher-capacity plant a decade later, which would not complete treatment until 2048, DOE has plans to build the first plant to be more capable. This would enable the first plant, along with supplemental low-activity waste treatment, to complete treatment of all the low-activity waste by 2028. To accommodate risk in the design-build approach the Department identified contingency for both costs and schedule. The Department estimated a budget for an 80 percent probability that the cost and schedule baseline will be attained (an approximate \$500 million increase in total project cost). Other risk planning and mitigation actions had already reduced program and technical risks by 25 percent. The WTP contractor did review its close-coupled approach and lengthened design/engineering schedules to allow more review cycle time and to mitigate the close coupling between design, procurement, and construction schedules. The result was that the Department incorporated a 6-month schedule contingency in a (WTP) schedule.

*Full Assessment of Potential Benefits of Initiatives to Reduce Cost.* The GAO observed that there was no formal documentation of potential cost-reduction benefits of increasing waste loading in solidified glass waste canisters. The corporate High-Level Waste Project team, as well as both our Savannah River Site and the Office of River Protection at Hanford, have identified potential savings opportunities and have preliminarily quantified these savings. We continue to explore potential options at these sites to continue to overcome technical and operational barriers concerning increased canister waste loading, while not interfering with the process for submitting a License Application to the Nuclear Regulatory Commission for construction of the geologic repository at Yucca Mountain.

*Impact of Key Legal Challenge to Accelerated Cleanup Plans.* A significant portion of the savings to be realized from accelerating the high-level waste program is premised on the assumption that DOE has the authority to manage and dispose of the tank wastes in a manner consistent with the risks they present. In particular, the Atomic Energy Commission, the Department of Energy, and the Nuclear Regulatory Commission have all been of the view that not all waste from reprocessing need be managed or disposed of as high level waste. It has further been both our view and that of the Nuclear Regulatory Commission that nothing in the Nuclear Waste Policy Act (NWPA), including the definition of "high level waste," changed that state of affairs. Rather, we believe, and we feel the NRC believes, that if we take appropriate steps to reduce the radioactivity of the tank wastes, including residual wastes, and solidify and treat them so that they can safely be disposed of without requiring the degree of isolation that a deep geologic repository for commercial spent fuel would provide, that course is fully consistent with the NWPA. This approach is consistent with a risk-based strategy, so that those wastes requiring the greatest degree of isolation, based upon risk to the public and the environment, are disposed of in a high-level waste geologic repository. Much of the Department's tank wastes resulted from spent nuclear fuel reprocessing activities that were performed to produce nuclear materials, primarily for defense purposes. While the untreated wastes remained in our storage tanks, DOE conservatively managed them as high-level waste. Once the waste is retrieved from the tanks, we intended to follow a basic strategy developed during the early 1980's to separate the wastes into a low-radioactivity fraction for treatment and disposal as low-level waste, and a high-radioactivity fraction for treatment and disposal in a high-level waste geologic repository. With this approach DOE could use safe and effective treatment methods and dispose of low activity tank waste as low-level waste. A number of our accelerated cleanup initiatives relied upon further refinements in the strategy for separating wastes into low-activity and high-activity fractions, particularly at Hanford and SRS.

As the GAO report states, our authority to make these determinations was challenged by several organizations in the U.S. District Court of Idaho in early 2002. In early July, the Court granted the plaintiffs' motion for summary judgment and declared invalid certain provisions of DOE Order 435.1 that we used to make such determinations. Counsel from the Department are consulting with counsel from the Department of Justice regarding whether to appeal the decision. In the near-term, I am working with our Counsel and our sites to determine immediate impacts to our operations.

The GAO recommended that the Department explore alternative strategies for dealing with an adverse legal decision. I support the GAO recommendation in this regard, that Congress clarify its intent concerning the Department's authority, under the Atomic Energy Act, to manage the waste from its reprocessing activities including implementation of an incidental waste policy.

In particular, the Department believes it would be useful for Congress to reaffirm that the NWPA does not mandate that the Department dispose of defense high-level wastes in a geologic repository constructed under the Nuclear Waste Policy Act. Such an affirmation would not affect the Department's current plans for disposing of HLW at Yucca Mountain consistent with the NWPA's requirements for cost allocation and capacity limits. The Department also seeks explicit legislative reaffirmation that the Department has the authority to determine which wastes from reprocessing do not require permanent disposal in a repository designed for spent nuclear fuel and high-level waste.

#### CONCLUSION

As I have stated in previous testimony, we are realizing that for the first time, the goal of completing EM's mission is within our grasp. We have set into motion a reformed cleanup program—one designed and managed to achieve risk reduction not just risk management; to shift focus from process to product; and to instill the

kind of urgency necessary to clean up and close down the nuclear legacy of the Cold War to protect human health and the environment.

We are at a turning point for this program. We must not lessen our resolve. The recommendations provided by the GAO are important. We will be vigilant in ensuring we are taking the appropriate corrective actions.

I ask for your support to continue this important work. The recent Court decision in the Idaho District Court will significantly hinder our ability to implement the accelerated program we have developed. Accelerating cleanup by almost 20 years and saving approximately \$20 billion in the high-level waste program will protect public health and safety and the environment and is a wise investment for our children's future.

I look forward to working with Congress and others to achieve this goal. I will be happy to answer questions.

Mr. GREENWOOD. Thank you very much for your testimony. It was very helpful.

Ms. Nazzaro.

#### **TESTIMONY OF ROBIN M. NAZZARO**

Ms. NAZZARO. Thank you, Mr. Chairman, and members of the subcommittee. I am pleased to be here today to discuss the Department of Energy's high-level waste cleanup program. DOE has about 94 million gallons of highly radioactive waste from the Nation's nuclear weapons program. This waste is currently in tanks at the Hanford and Savannah River Sites, and at the Idaho National Laboratory near Idaho Falls.

In February of 2002, DOE began an initiative to reduce the program's nearly \$105 billion estimated cost and 70-year timeframe to finish the disposal of this waste.

Based on work included in our report being released by the subcommittee today, my testimony today focuses on the components of DOE's high-level waste and the process involved in preparing the waste for disposal, the status of DOE's initiative, the legal and technical challenges that DOE faces in implementing the initiative, and any further opportunities to reduce costs beyond those identified in DOE's current cost savings proposal or to improve program management.

In summary, Mr. Chairman, DOE's high-level waste is a complex mixture of radioactive and hazardous components. A small portion of the radioactive components will remain dangerously radioactive for millions of years. However, the vast majority will lose much of their radioactivity more quickly. To prepare the waste for permanent disposal, DOE plans to separate much of the radioactive material from the other waste components.

The initiative to accelerate the cleanup is still evolving. And while its savings estimates are changing accordingly, we have concerns about the reliability of the estimates. As of April 2003, DOE estimated it could shorten the waste cleanup schedule by 25 to 30 years and save up to \$29 billion. To help achieve these schedule and cost reductions, DOE has identified alternative treatment and disposal strategies, such as disposing of the radioactive waste on-site, rather than moving it to an underground repository.

However, DOE's savings estimates for these approaches may not be reliable or complete. For example, the savings analysis does not take into account all costs associated with alternative treatment strategies. Also, the estimate of savings does not compare costs on the basis of present value. At the DOE Savannah River Site, such

an adjustment could lower the potential savings for accelerated waste processing by \$2.5 billion. Further, DOE faces significant legal and technical challenges that could limit the schedule and cost reductions. On the legal side, DOE's proposal depended heavily on the Agency's authority to apply a designation other than high-level waste to the low activity portion of the waste.

As you know, the recent court ruling invalidated this process, putting the accelerated schedule and potential savings in jeopardy. On the technical side, DOE's proposals rely heavily on the successful application of waste separation methods that are still under development and will not be fully tested before being put into place.

For example, at the Hanford Site, DOE intends to build the facility for separating the waste before fully testing the technologies on an integrated basis. Previously this approach at the Savannah River Site failed, resulting in significant cost increases and schedule delays. DOE is exploring additional cost savings beyond those identified in its current cost savings proposal. At the Hanford and Savannah River Sites, DOE is exploring options to increase the amount of waste that can be concentrated in the canisters destined for the permanent underground repository.

DOE's data indicates that these proposals, if successful, could save billions of dollars. However, considerable evaluation of these proposals remains to be done and cost savings estimates have not yet been fully developed. DOE also has opportunities to improve the management of its cleanup program by addressing management weakness that we and others have identified in the past.

Those weaknesses include, making key decisions without rigorous supporting analysis, incorporating technology into projects before being sufficiently tested, and pursuing a fast-track approach whereby facility construction begins before completing sufficient design work. Although DOE has taken steps to improve program management, it does not appear that DOE's current management efforts will fully address these weaknesses.

Our report makes several recommendations to DOE that we believe will help to manage or reduce the legal and technical risks to the program, avoid costly delays, and strengthen overall management. Before the court ruling, we recommended that DOE seek clarification from the Congress regarding the authority to determine that some waste can be treated and disposed of onsite. Since the court invalidated this process, one option DOE may want to consider is to ask the Congress to provide legislative authority for DOE to implement an incidental waste policy.

Regarding our recommendations to reassess the approach for incorporating new waste separation technologies at the Hanford Site, and to ensure that high-level waste projects include rigorous analysis and follow best practices, DOE believes that its current practices are adequate. We disagree and continue to believe that the recommendations are warranted.

Thank you, Mr. Chairman, and members of the subcommittee. That concludes my statement. I would be pleased to respond to any questions that you may have.

[The prepared statement of Robin M. Nazzaro follows:]

PREPARED STATEMENT OF ROBIN M. NAZZARO, DIRECTOR, NATURAL RESOURCES AND ENVIRONMENT, U.S. GENERAL ACCOUNTING OFFICE

Mr. Chairman and Members of the Subcommittee: We are pleased to be here today to discuss the Department of Energy's (DOE) high-level waste cleanup program. DOE has about 94 million gallons of highly radioactive nuclear waste from the nation's nuclear weapons program. This waste is currently in temporary storage at DOE sites in Washington, South Carolina, and Idaho. After investing more than 20 years and about \$18 billion, DOE acknowledged in February 2002 that the program to clean up its high-level waste was far behind schedule, far over budget, and in need of major change. In 2002, DOE began an initiative to reduce the program's nearly \$105-billion estimated cost and 70-year time frame to finish permanent disposal of this waste. Our testimony, based on work included in the report being released by the Subcommittee today,<sup>1</sup> discusses (1) the components of DOE's high-level waste and the process involved in preparing the waste for disposal, (2) the status of DOE's accelerated cleanup initiative for high-level waste, (3) legal and technical challenges DOE faces in implementing the initiative, and (4) further opportunities to reduce costs beyond those identified in DOE's current cost-savings proposal or to improve program management.

In summary, we found the following:

- DOE's high-level waste has many components, ranging from radioactive isotopes and corrosive chemicals to the water in which much of this material was initially discharged. The radioactive components vary greatly; a small portion will remain dangerously radioactive for millions of years, while the vast majority will lose much of their radioactivity more quickly, so that more than 90 percent of the current radioactivity will be gone within 100 years. To prepare the waste for permanent disposal, DOE plans to separate the waste into two waste streams: one with high levels of radioactivity and the other with lower concentrations of radioactivity. DOE expects that this process will concentrate at least 90 percent of the radioactivity into a volume that is significantly smaller than the current total volume of waste. DOE plans to immobilize and bury the highly radioactive portion in a permanent underground repository. The remaining waste will be immobilized and disposed of at the location where it is currently stored or at some other location.
- DOE's initiative to accelerate the cleanup is evolving, and while its savings estimates are changing accordingly, we have ongoing concerns about the reliability of those estimates. As of April 2003, DOE estimated it could shorten the waste cleanup schedule by 20-35 years and save up to \$29 billion. To help achieve these schedule and cost reductions, DOE has identified alternative treatment and disposal strategies, such as developing ways to permanently dispose of more of the radioactive waste at current sites rather than moving it to the planned underground repository. However, our assessment of DOE's savings estimate indicates that it may not be reliable. For example, the savings analysis does not take into account all costs associated with alternative treatment strategies. Also, the estimate of savings does not compare costs on the basis of "present value," where dollars to be saved in future years are discounted to a common year to reflect the time value of money. At DOE's Savannah River Site in South Carolina, such an adjustment would lower the savings estimate for accelerated waste processing by \$2.6 billion—from \$5.4 billion to \$2.8 billion (in 2003 dollars).
- DOE faces significant legal and technical challenges to realize the estimated savings. A key legal challenge involves DOE's authority to apply a designation other than high-level waste to some waste with relatively low concentrations of radioactivity, so that this portion can be treated less expensively than highly radioactive waste. A recent court ruling invalidated this redesignation process, thus precluding DOE from proceeding with this element of its accelerated initiative. If DOE cannot meet its accelerated schedules, then potential savings are in jeopardy. A key technical challenge is that DOE's approach relies primarily on laboratory testing to confirm that separating waste into high-level and low-activity portions will be successful. At the Hanford Site in Washington State, DOE is planning to construct full-scale facilities before fully testing the technologies on an integrated basis—an approach that has failed on another project in the past, resulting in significant cost increases and schedule delays.
- DOE is exploring additional cost savings beyond those identified in its current cost-saving proposals. The proposals that offer significant potential are being

<sup>1</sup>U.S. General Accounting Office, *Nuclear Waste: Challenges to Achieving Potential Savings in DOE's High-Level Waste Cleanup Program*, GAO-03-593 (Washington, D.C.: June 17, 2003).

developed by the Hanford and Savannah River sites. These proposals call for increasing the amount of waste that can be concentrated into the canisters destined for the permanent underground repository. DOE's data indicates that these proposals, if successful, could save several billion dollars. Considerable evaluation of these proposals remains to be done and cost-saving estimates have not yet been fully developed, according to DOE officials. DOE also has opportunities to improve its management of the cleanup program by addressing management weaknesses that we and others have identified in the past. Although DOE has—taken steps to improve program management, we have continuing concerns about management weaknesses in several areas. These include making key decisions without rigorous supporting analysis, incorporating technology into projects before it is sufficiently tested, and pursuing a “fast-track” approach of launching into facility construction before completing sufficient design work. It does not appear that DOE's current management efforts will fully address these weaknesses.

Our report makes several recommendations to DOE that, if implemented, will help to manage or reduce legal and technical risks to the program, avoid costly delays, and strengthen overall program management. DOE agreed to consider our recommendation to seek clarification from the Congress regarding its authority to determine that some waste can be treated and disposed of as other than high-level waste. However, regarding our recommendations that the department conduct integrated pilot testing of its waste separation processes at Hanford, and take steps to improve the management of high-level waste projects, such as by conducting more rigorous analyses to support key project decisions, DOE believes that its current approach is adequate. We do not agree with DOE's views and continue to believe that all of our recommendations are warranted.

#### BACKGROUND

DOE has a vast complex of sites across the nation dedicated to the nuclear weapons program. DOE largely ceased production of plutonium and enriched uranium by 1992, but the waste remains at the sites. Most of the tanks in which the waste is stored have already exceeded their design life. For example, many of Hanford's and Savannah River's tanks were built in the 1940s to 1960s and were designed to last 1040 years. Leaks from some of these tanks were first detected at Hanford in 1956 and at Savannah River in 1959. Given the age and deteriorating condition of some of the tanks, there is concern that some of them will leak additional waste into the soil, where it may migrate to the water table and, in the case of the Hanford Site, to the Columbia River.

Responsibility for the highlevel waste produced at DOE facilities is governed primarily by federal laws, including the Atomic Energy Act of 1954. These laws established responsibility for the regulatory control of radioactive materials including DOE's high-level waste and assigned the Nuclear Regulatory Commission (NRC) the function of licensing facilities that are expressly authorized for long-term storage of highlevel radioactive waste generated by DOE. In addition, the Nuclear Waste Policy Act of 1982 defined highlevel radioactive waste. Various other federal laws, including the Resource Conservation and Recovery Act of 1976, guide how DOE must carry out its cleanup program. The high-level waste cleanup program is under the leadership of the Assistant Secretary for Environmental Management. It involves consultation with a variety of stakeholders, including the Environmental Protection Agency, state environmental agencies where DOE sites are located, county and local governmental agencies, citizen groups, advisory groups, and Native American tribes.

#### DOE'S HIGH-LEVEL WASTE IS A COMPLEX MIXTURE THAT REQUIRES A MULTI-STEP PROCESS TO PREPARE FOR DISPOSAL

The waste in the tanks at the Hanford and Savannah River sites and the Idaho National Laboratory near Idaho Falls is a complex mixture of radioactive and hazardous components. DOE's process for preparing it for disposal is designed to separate much of the radioactive material from other waste components.

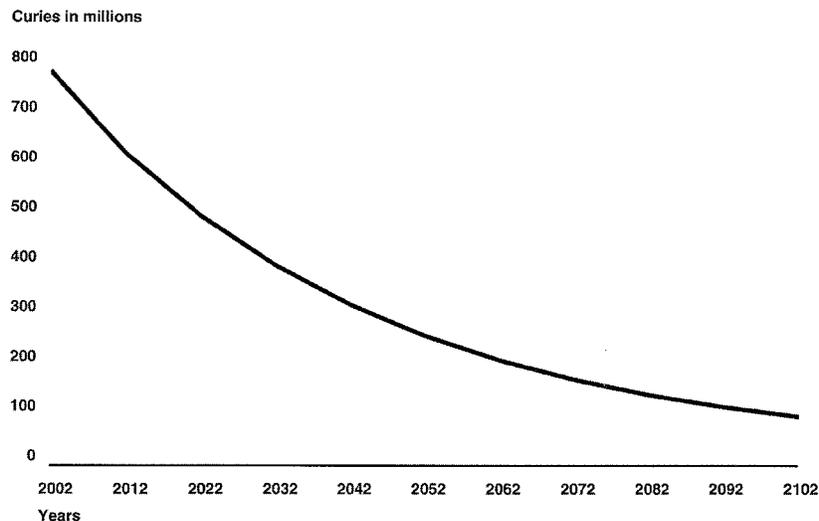
#### *Much of the Radioactivity Declines Relatively Quickly*

Nearly all the radioactivity in the waste originates from radionuclides with half-lives<sup>2</sup> of about 30 years or less. The relatively short half-lives of most of the radio-

<sup>2</sup>Each radioactive component, or radionuclide, in high-level waste loses its radioactivity at a rate that differs for each component. This rate of decay, which cannot be changed, is measured in “half-lives”—that is, the length of time required for half of the unstable atoms to decay and release their radiation.

nuclides in the waste means that within 30 years, about 50 percent of the current radioactivity will have decayed away, and within 100 years this figure will rise to more than 90 percent. Figure 1 shows the pattern of decay, using 2002 to 2102 as the 100-year period. Extending the analysis beyond the 100-year period shown in the figure, in 300 years, 99.8 percent of the radioactivity will have decayed, leaving 0.2 percent of the current radioactivity remaining.

**Figure 1: Natural Decay of Radionuclides in DOE's Untreated High-Level Waste from 2002 to 2102**



Source: GAO analysis of DOE data.

Note: Radioactivity is measured in a unit called a curie. One curie equals 37 billion atomic disintegrations per second.

Despite the relatively rapid decay of most of the current radioactivity, some radionuclides have half-lives in the hundreds of thousands of years and will remain dangerously radioactive for millions of years. Some of these long-lived radionuclides are potentially very mobile in the environment and therefore must remain permanently isolated. If these highly mobile radionuclides leak out or are released into the environment, they can contaminate the soil and water.

#### PROCESSING CAN CONCENTRATE THE RADIOACTIVITY INTO A MUCH SMALLER VOLUME OF WASTE

DOE plans to isolate the radioactive components and prepare the waste for disposal through a multi-step treatment process. DOE expects this process to concentrate at least 90 percent of the radioactivity into a much smaller volume that can be permanently isolated for at least 10,000 years in a geologic repository. The portion of the waste not sent to the geologic repository will have relatively small amounts of radioactivity and long-lived radionuclides. Based on current disposal standards used by the NRC, if the radioactivity of this remaining waste is sufficiently low, it can be disposed of on site near the surface of the ground, using less complex and expensive techniques than those required for the highly radioactive portion. DOE plans to dispose of this waste on site in vaults or canisters, or at other designated disposal facilities.

DOE has successfully applied this process in a demonstration project at the West Valley site in New York State. At West Valley, separation of the low-activity portion from the high-level portion of the waste reduced by 90 percent the quantity of waste requiring permanent isolation and disposal at a geologic repository. The high-level portion was stabilized in a glass material (vitrified) and remains stored at the site pending completion of the high-level waste geologic repository and resolution of other

issues associated with disposal costs.<sup>3</sup> The remaining low-activity portion was mixed with cement-forming materials, poured into drums where it solidified into grout (a cement-like material), and remains stored on site, awaiting shipment to an off-site disposal facility.

S INITIATIVE FOR ACCELERATING CLEANUP IS STILL EVOLVING, WITH THE EXTENT OF SAVINGS UNCERTAIN

DOE's new initiative, implemented in 2002, attempts to address the schedule delays and increasing costs DOE has encountered in its efforts to treat and dispose of highlevel waste. This initiative is still evolving. As of April 2003, DOE had identified several strategies to help reduce the time needed to treat and dispose of the waste. Based on these strategies, DOE estimated that it could reduce the waste cleanup schedule by about 20 to 35 years at its high-level waste sites and save about \$29 billion compared to the existing program baseline.<sup>4</sup> While some degree of savings is likely if the strategies are successfully implemented, the extent of the savings is still uncertain.

*Initiative Centers on Ways to Speed Disposal and Save Money*

Many of DOE's proposals to speed cleanup and reduce environmental risk involve ways to do one or more of the following:

- Deal with some tank waste as low-level or transuranic<sup>5</sup> waste, rather than as highlevel waste. Doing so would eliminate the need to vitrify the waste for off-site disposal in the geologic repository for highlevel waste.
- Complete the waste treatment more quickly by using additional or supplemental technologies. For example, DOE's Hanford Site is considering using up to four supplemental technologies, in addition to vitrification, to process its low-activity waste. DOE believes these technologies are needed to help it meet a schedule milestone date of 2028 agreed to with regulators to complete waste processing. Without these technologies, DOE believes waste treatment would not be completed before 2048.
- Segregate the waste more fully than initially planned and tailor waste treatment to each of the waste types. By doing so, DOE plans to apply less costly treatment methods to waste with lower concentrations of radioactivity.
- Close waste storage tanks earlier than expected, thereby avoiding the operating costs involved in maintaining the tanks and monitoring the wastes.

Table 1 summarizes the estimated cost savings for each DOE site if accelerated proposals for cleaning up high-level waste are successfully implemented.

Table 1: DOE's Estimated Cost Savings from Proposals to Accelerate Cleanup of High-Level Waste

Amounts are in billions of current dollars, fiscal year 2003 to the end of cleanup

Site	Current baseline lifecycle cost estimate	Accelerated lifecycle cost estimate	Estimated savings from accelerated initiatives
Idaho National Laboratory .....	\$10.07	\$3.10	\$6.97
Hanford .....	56.19	41.67	14.52
Savannah River .....	18.82	11.49	7.33
Totals .....	\$85.08	\$56.26	\$28.82

Source: DOE.

Note: West Valley is not included in this table because high-level waste cleanup at the site was essentially completed in September 2002.

<sup>3</sup>At Savannah River, highlevel sludge from the tanks has also been stabilized in glass material and is currently stored on site pending completion of the geologic repository. As of August 30, 2002, Savannah River had produced 1,331 canisters of this stabilized waste.

<sup>4</sup>Unless otherwise noted, all dollar estimates are as reported by DOE and are in current—dollars.

<sup>5</sup>Low-level radioactive waste is defined as radioactive material that is not highlevel radioactive waste, spent nuclear fuel, transuranic waste, or certain by-product material (the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material content). 42 U.S.C. 10101(16). Transuranic wastes come primarily from reprocessing of spent nuclear fuel and from fabrication of nuclear weapons. Transuranic waste is defined as waste with radionuclides with atomic numbers greater than 92 (that is, uranium) and having half-lives greater than 20 years in concentrations greater than 100 nanocuries per gram.

## SAVINGS ESTIMATE MAY NOT BE RELIABLE

Our review indicates that DOE's current estimate of \$29 billion may not yet be reliable and that the actual amount to be saved if DOE successfully implements the alternative waste treatment and disposal strategies may be substantially different from what DOE is projecting. We have several concerns about the reliability and completeness of the estimate. These concerns include the accuracy of baseline cost estimates from which savings are calculated, whether all appropriate costs are included in the analysis, and whether the savings estimates properly reflect the timing of the savings or uncertainties.

*Baseline Costs Are Not Fully Reliable*

DOE's current lifecycle cost baseline is used as the base cost from which potential savings associated with any improvements are measured. However, in recent years, we and others have raised concerns about the reliability of DOE's baseline cost estimates. In a 1999 report, we noted that DOE lacked a standard methodology for sites to use in developing their lifecycle cost baseline, raising a concern about the reliability of data used to develop these cost estimates.<sup>6</sup> DOE's Office of Inspector General also raised a concern in a 1999 review of DOE project estimates, noting that several project cost estimates examined were not supported or complete. DOE acknowledged in its February 2002 review of the cleanup program that baseline cost estimates do not provide a reliable picture of project costs.<sup>7</sup>

*Estimates of Project Costs May Be Incomplete*

Some of DOE's savings may be based on incomplete estimates of the costs for the accelerated proposals. According to Office of Management and Budget (OMB) guidance on developing cost estimates, agencies should ensure that all appropriate costs are addressed in the estimate. However, DOE has not always done so. For example, the Idaho National Laboratory's estimated savings of up to \$7 billion is based, in large part, on eliminating the need to build a vitrification facility to treat its waste. However, the waste may have to undergo an alternative treatment method before it can be accepted at a geological repository, and the Idaho National Laboratory is considering four different technologies for doing so. Nevertheless, DOE's current savings estimate reflects the potential cost of only one of those technologies. DOE has not yet developed the costs of using any of the other waste treatment approaches. DOE noted that the accelerated lifecycle estimate could likely change depending on which one of the technologies is selected and the associated costs of treating the waste are developed.

*Savings Estimates Do Not Reflect Timing, Uncertainty, or Nonbudgetary Impacts*

According to OMB guidance, agencies should ensure that the timing of when the savings will occur is accounted for, that uncertainties are recognized and quantified where possible, and that nonbudgetary impacts, such as a change in the level of risk to workers, are quantified, or at least described. We found problems in all three areas.

- Regarding the time value of money, applying OMB guidance would mean that estimates of savings in DOE's accelerated plans should reflect a comparison of its baseline cost estimate with the alternative, expressed in a "present value," where the dollars are discounted to a common year to reflect the time value of money. Instead, DOE's savings estimates generally measure savings by comparing dollars in different years. For example, the Savannah River Site estimates a savings of nearly \$5.4 billion by reducing by 8 years (from 2027 to 2019) the time required to process its highlevel waste. Adjusting the savings estimate to present value in 2003 results in a savings of \$2.8 billion in 2003 dollars.
- Regarding uncertainties, in contrast to OMB guidance, the DOE savings estimates generally do not consider uncertainties. For example, the savings projected in the Idaho National Laboratory's accelerated plan reflect the proposal to no longer build the vitrification facility and an associated reduction in operations costs. However, the savings do not account for uncertainties such as whether alternatives to vitrification will succeed and at what cost. Rather than reflecting uncertainties by providing a range of savings, DOE's savings estimate is a single point estimate of \$7 billion.

<sup>6</sup>U.S. General Accounting Office, *Nuclear Waste: DOE's Accelerated Cleanup Strategy Has Benefits but Faces Uncertainties*, GAO/RCED99129 (Washington, D.C.: Apr. 30, 1999).

<sup>7</sup>U.S. Department of Energy, *A Review of the Environmental Management Program* (Washington, D.C.: Feb. 4, 2002).

- Regarding nonbudgetary impacts, DOE's savings estimates generally do not fully assess the value of potential nonbudgetary impacts, such as a change in the level of risk to workers or potential effects on the environment. OMB guidelines recommend identification and, where possible, quantification of other expected benefits and costs to society when evaluating alternative plans. For example, the Idaho National Laboratory's accelerated plan does not assess potential increases in environmental risk, if any, from disposing of the waste without stabilizing it into a vitrified form. By not assessing these benefits and risks to workers and the environment, DOE leaves unclear how important these risks and trade-offs are to choosing an alternative treatment approach.

KEY LEGAL AND TECHNICAL CHALLENGES COULD LIMIT POTENTIAL SAVINGS FROM  
DOE'S ACCELERATED CLEANUP INITIATIVE

DOE faces significant legal and technical challenges in achieving the cost and schedule reductions proposed in its new initiative. On the legal side, DOE's proposals depend heavily on the agency's authority to apply a designation other than "highlevel waste" to the low-activity portion of the waste stream, so that this low-activity portion does not have to be disposed of more expensively as highlevel waste. The portion of DOE's order setting out criteria for making such determinations has been invalidated in a recent court ruling. On the technical side, DOE's proposals rest heavily on the successful application of waste separation methods that are still under development and will not be fully tested before being put in place. DOE's track record in this regard has not been strong; it has had to abandon past projects that were also based on promising—but not fully tested—technologies. Either or both of these challenges could limit the potential savings from DOE's accelerated cleanup initiative.

*DOE's Accelerated Initiative Relies on a Process for Reclassifying Waste That the Court Has Ruled Invalid*

DOE has traditionally managed all of the wastes in its tanks as highlevel waste because the waste resulted primarily from the reprocessing of spent nuclear fuel and contains significant amounts of radioactivity. However, by separating the waste into high-level and low-activity portions and managing the low-activity portion as something other than high-level waste, DOE could use less costly and less complicated treatment approaches. DOE has developed guidelines for deciding when waste in the tanks should not be considered highlevel waste. In 1999, under Order 435.1, DOE formalized its process for determining which waste is incidental to reprocessing ("incidental waste"), not high level waste, and therefore will not be sent to a geological repository for highlevel waste disposal. This process provides a basis for DOE to treat and dispose of some portion of its wastes less expensively as low-level or transuranic wastes.

DOE's ability to define some waste as incidental to reprocessing, and to then follow a different set of treatment and disposal requirements for that waste, is central to its overall strategy for addressing its tank waste. For example, DOE planned to use its incidental waste process to manage about 90 percent of its 54 million gallons of tank waste at the Hanford Site as low-level waste, rather than process it through a highlevel waste vitrification facility. Using that approach, most of the waste would be eligible for treatment and disposal on site. Such an approach would save billions compared to treating all of the waste as highlevel waste and sending it for disposal in a highlevel waste geologic repository.

A recent court ruling precludes DOE from reclassifying some of its waste as other than high-level waste. In March 2002, the Natural Resources Defense Council and others filed a lawsuit challenging DOE's authority to manage its wastes through its incidental waste process.<sup>8</sup> The plaintiffs alleged that DOE arbitrarily established the incidental waste determination process without proper regard for the law or properly establishing a justification for this process. A primary concern of the plaintiffs was that DOE would use its incidental waste process to permanently leave intensely radioactive waste sediments in the tanks with only minimal treatment. The lawsuit alleged that DOE's incidental waste process improperly allows DOE to reclassify high-level waste as incidental waste that does not need to be treated in the same way as high-level waste. According to the plaintiffs, the Nuclear Waste Policy

<sup>8</sup>*Natural Resources Defense Council, Inc. v. Abraham*, No. 01-CV-413 (D. Idaho, filed Mar. 5, 2002). The lawsuit was originally filed in January 2000 in the 9th Circuit Court of Appeals and was subsequently transferred to the federal district court in Idaho. The other parties to the lawsuit are the Snake River Alliance, the Confederated Tribes and Bands of the Yakama Nation, and the Shoshone Bannock Tribes. In addition, the states of Washington, Idaho, Oregon and South Carolina are participating as *amicus curiae*.

Act defines all waste originating from a given source—that is, from reprocessing of spent nuclear fuel—as highlevel waste and requires that such waste be managed as highlevel waste, yet DOE has chosen to differentiate its wastes according to the level of radioactivity and manage them accordingly. In a July 3, 2003 ruling on the lawsuit, the court agreed with the plaintiffs, stating that the portion of DOE's Order 435.1 setting out its incidental waste determination process violates the Nuclear Waste Policy Act and thus is invalid.

The court's ruling could seriously hinder DOE's efforts to implement its accelerated treatment and disposal strategies. Under the ruling, DOE's incidental waste determinations cannot be implemented. Since the start of the lawsuit, DOE had not implemented any of its approved incidental waste determinations and had not yet decided whether to defer or proceed with its pending incidental waste determinations—such as those for closing tanks at the Savannah River Site and Idaho National Laboratory.

If DOE appeals the court ruling, a lengthy legal process could follow. A lengthy legal process will also likely delay treatment plans for this waste and delay closing tanks on an accelerated schedule. For example, the Idaho National Laboratory planned to begin closing tanks in the spring of 2003, pending approval of an incidental waste determination that would allow DOE to close the tanks by managing tank waste residuals as low-level waste.<sup>9</sup> A DOE official at the Idaho National Laboratory told us that while a delay of several months would not immediately threaten schedule dates, a delay beyond 24 months would seriously affect the site's ability to meet its accelerated 2012 date to close all of the tanks.

If the court's ruling invalidating DOE's incidental waste determination process is upheld, DOE may need to find an alternative that would allow it to treat waste with lower concentrations of radioactivity less expensively. Searching for such an alternative could delay progress at all three of DOE's highlevel waste sites that rely on incidental waste determinations. If DOE cannot meet its accelerated schedules, then potential savings are in jeopardy. At this point, the department does not appear to have a strategy to avoid the potential effects of challenges to its incidental waste determination authority, either from the current court ruling or future challenges. At the time of our report, DOE officials told us that they believed the department would prevail in the legal challenge. DOE believed it would be premature to explore alternative strategies to overcome potentially significant delays to the program that could result from a protracted legal conflict or from an adverse decision. Such strategies could range from exploring alternative approaches for establishing an incidental waste regulation to asking that the Congress provide legislative authority for DOE to implement an incidental waste policy.

#### *Accelerated Initiative Also Relies on Waste Separation Approaches That Will Not Be Fully Tested*

Like the ability to determine that some waste is incidental to reprocessing, the ability to separate the waste components is important to meet waste cleanup schedule and cost goals. If the waste is not separated, all of it—about 94 million gallons—may have to be treated as highlevel waste and disposed of in the geological repository. Doing so would require a much larger repository than currently planned, and drive up disposal costs by billions of dollars. Successful separation will substantially reduce the volume of waste needing disposal at the planned repository, as well as the time and cost required to prepare it for disposal, and allow less expensive methods to be used in treating and disposing of the remaining low-activity waste. The waste separation process is complicated, difficult, and unique in scope at each site. The waste differs among sites not only in volume but also in the way it has been generated, managed, and stored over the years.

The challenge to successfully separate the waste is significant at the Hanford Site, where DOE intends to build a facility for separating the waste before fully testing the separation processes that will be used. The planned laboratory testing includes a combination of pilot-scale testing of major individual processes and use of operational data for certain of those processes for which DOE officials said they had extensive experience. However, integrated testing will not be performed until full-scale facilities are constructed. DOE plans to fully test the processes for the first time during the operational tests of the newly constructed facilities.

This approach does not fully reflect DOE guidance, which calls for ensuring that new or complex technology is mature before integrating it into a project. Specifically, DOE's Project Management Order 413.3 requires DOE to assess the risks associated with technology at various phases of a project's development. For projects with sig-

<sup>9</sup>Tank closure at the Idaho National Laboratory is also pending completion of its National Environmental Policy Act—process.

nificant technical uncertainties that could affect cost and schedule, corrective action plans to address these uncertainties are required before the projects can proceed. In addition, DOE's supplementary project management guidance suggests that technologies be developed to a reasonable level of maturity before a project progresses to full implementation to reduce risks and avoid cost increases and schedule delays. The guidance suggests that DOE avoid the risk of designing facilities concurrently with technology development.

The laboratories working to develop Hanford's waste separation process have identified several technical uncertainties, which they are working to address. These uncertainties or critical technology risks include problems with separating waste solids through an elaborate filtration system, problems associated with mixing the waste during separation processes, and various problems associated with the low-activity waste evaporator.

Given these and other uncertainties, Hanford's construction contractor and outside experts have seen Hanford's approach as having high technical risk and have proposed integrated testing during project development. However, DOE and the construction contractor eventually decided not to construct an integrated pilot facility and instead to accept a high-risk approach. DOE officials said they wanted to avoid increasing project costs and schedule delays, which they believe will result from building a testing facility. Instead, Hanford officials said that they will continue to conduct pilot-scale tests of major separation processes. DOE officials said they believe this testing will provide assurance that the separation processes will function in an integrated manner. After the full-scale treatment facilities are constructed, DOE plans to fully test and demonstrate the separation process during facility start-up operations.

The consequences of not adhering to sound technology development guidelines can be severe. At the Savannah River Site, for example, DOE invested nearly \$500 million over nearly 15 years to develop a waste separation process, called in-tank precipitation, to treat Savannah River's highlevel waste. While laboratory tests of this process were viewed as successful, DOE did not adequately test the components until it started full-scale operations. DOE followed this approach, in part, because the technology was commercially available and considered "mature." However, when DOE started full-scale operations, major problems occurred. Benzene, a dangerously flammable byproduct, was produced in large quantities. Operations were stopped after DOE spent about \$500 million because experts could not explain how or why benzene was being produced and could not determine how to economically reconfigure the facility to minimize it. Consequences of this technology failure included significant cost increases, schedule delays, a full-scale waste separation process that did not work, and a less-than-optimum waste treatment operation. Savannah River is now developing and implementing a new separation technology at an additional cost of about \$1.8 billion and a delay of about 7 years.<sup>10</sup>

Subsequent assessments of the problems that developed at Savannah River found that DOE (1) relied on laboratory-scale tests to demonstrate separation processes, (2) believed that technical problems could be resolved later during facility construction and startup, and (3) decided to scale up the technology from lab tests to full-scale without the benefit of using additional testing facilities to confirm that processes would work at a larger scale. Officials at Hanford are following a similar approach. Several experts with whom we talked cautioned that if separation processes at Hanford do not work as planned, facilities will have to be retrofitted, and potential cost increases and schedule delays would be much greater than any associated with integrated process testing in a pilot facility.

#### OPPORTUNITIES EXIST TO EXPLORE ADDITIONAL COST SAVINGS AND TO STRENGTHEN PROGRAM MANAGEMENT

In addition to the potential cost savings identified in the accelerated site cleanup plans, DOE continues to develop and evaluate other proposals to reduce costs but is still assessing them. Although the potential cost savings have not been fully developed, they could be in the range of several billion dollars, if the proposals are successfully implemented. At the Savannah River and Hanford sites, for example, DOE is identifying ways to increase the amount of waste that can be placed in its highlevel waste canisters to reduce treatment and disposal costs. DOE also has a number of initiatives under way to improve overall program management. However, we are concerned that the initiatives may not be adequate. In our examinations of problems that have plagued DOE's project management over the years, three con-

<sup>10</sup> U.S. General Accounting Office, *Nuclear Waste: Process to Remove Radioactive Waste From Savannah River Tanks Fails to Work*, GAO/RCED-99-69 (Washington, D.C.: Apr. 30, 1999).

tributing factors often emerged making key project decisions without rigorous analysis, incorporating new technology before it has received sufficient testing, and using a “fast-track” approach (concurrent design and construction) on complex projects. Ensuring that these weaknesses are addressed as part of its program management initiatives would further improve the management of the program and increase the chances for success.

*DOE Is Considering Additional Potential Opportunities to Reduce Costs*

DOE is continuing to identify other proposals for reducing costs under its accelerated cleanup initiative. Among the proposals that DOE is considering, the ones that appear to offer significant cost savings opportunities would increase the amount of waste placed in each disposal canister. The amount of waste that can be placed into a canister depends on a complex set of factors, including the specific mix of radioactive material combined with other chemicals in the waste, such as chromium and sulfate, that affect the processing and quality of the immobilized product. These factors affect the percentage of waste than can be placed in each canister because they indicate the likelihood that radioactive constituents could move out of the immobilizing glass medium and into the environment. The greater the potential for the waste to become mobile, the lower the allowable percentage of waste and the higher the percentage of glass material that must be used.

Savannah River officials believe they can increase the amount of waste loaded in each canister from 28 percent to about 35 percent, and for at least one waste batch, to nearly 50 percent. In June 2003, Savannah River began to implement this new process to increase the amount of waste in each canister. If successful, Savannah River’s improved approach could reduce the number of canisters needed by about 1,000 canisters and save about \$2.7 billion, based on preliminary estimates. Other efforts to increase waste loading of the canisters are also under way that, if successful, may permit further cost savings of about \$1.7 billion. The Hanford Site is also exploring ways to decrease the numbers of waste canisters that will be needed by using waste forms other than the standard borosilicate glass. This effort is in a very early stage of development and cost-savings estimates have not been fully developed.

DOE HAS OPPORTUNITIES TO IMPROVE MANAGEMENT OF THE PROGRAM BY ADDRESSING PREVIOUSLY IDENTIFIED WEAKNESSES

In addition to site-specific proposals for saving time and money, DOE is also undertaking management improvements using teams to study individual issues. Nine teams are currently in place, while other teams to address issues such as improving the environmental review process to better support decision making have not yet been formed. Each team has a disciplined management process to follow,<sup>11</sup> and even after the teams’ work is completed, any implementation will take time. These efforts are in the early stages, and therefore it is unclear if they will correct the performance problems DOE and others have identified.

We are concerned that these management reforms may not go far enough in addressing performance problems with the highlevel waste program. Our concerns stem from our review of initiatives under way in the management teams, our discussions with DOE officials, and our past and current work, as well as work by others inside and outside DOE. We have identified three recurring weaknesses in DOE’s management of cleanup projects that we believe need to be addressed as part of DOE’s overall review. These weaknesses cut across the various issues that the teams are working on and are often at the center of problems that have been identified. Two of these weaknesses have been raised earlier in this testimony—lack of rigor in the analysis supporting key decisions, and incorporating technology into projects before it is sufficiently mature. The final area of weakness involves using “fast-track” methods to begin construction of complex facilities before sufficient planning and design have taken place.

*Key Decisions Not Always Supported by Rigorous Current Analysis*

DOE’s project management guidance emphasizes the importance of rigorous and current analysis to support decision making during the development of DOE projects. Similarly, OMB guidance states that agencies should validate earlier planning decisions with updated information before finalizing decisions to construct facilities. This validation is particularly important where early cost comparisons are susceptible to uncertainties and change.

<sup>11</sup> Under DOE’s project management principles, for example, teams must define project requirements, conduct preliminary risk assessments, and prepare a risk mitigation plan prior to developing a baseline cost estimate of proposed alternatives.

DOE does not always follow this guidance, yet no DOE management team appears to be addressing this weakness. Proceeding without rigorous review has been a recurring cause of many of the problems we have identified in past DOE projects. For example, the decision at Hanford to construct a vitrification plant to treat Hanford's low-activity waste has not been validated with updated information. Hanford's primary analysis justifying the cost of this approach was prepared in 1999 and was based on technical performance data, disposal assumptions, and cost data developed in the early to mid-1990s conditions that are no longer applicable. Subsequent analyses have continued to rely on this data. However, since that time conditions have changed, including the performance capabilities of alternative technologies such as grout, the relative cost of different technologies, and the amount of waste DOE intends to process through a vitrification facility.

DOE officials disagree with our assessment of their analysis, stating that a comprehensive analysis was conducted in the spring of 2003. However, DOE's highlevel waste project team agreed that the DOE officials at Hanford had not performed a current, rigorous analysis of low-activity waste treatment options including the use of grout as an alternative to vitrification, and the team encouraged the Hanford site to update its analysis based on current waste treatment and disposal assumptions. DOE officials at Hanford told us they do not plan to reassess the decision to construct a low-activity vitrification facility because their compliance agreement with the state of Washington calls for vitrification of this waste. They also stated that vitrification is a technology needed for destroying hazardous constituents in a portion of the waste.

*New Technology Is Incorporated before It Is Sufficiently Mature*

Our work on Department of Defense acquisitions has documented a set of "best practices" used by industry for integrating new technology into major projects. We reported in July 1999 that the maturity of a technology at the start of a project is an important determinant of success.<sup>12</sup> As technology develops from preconceptual design through preliminary design and testing, the maturity of the technology increases and the risks associated with incorporating that technology into a project decrease. Waiting until technology is well-developed and tested before integrating it into a project will greatly increase the chances of meeting cost, schedule, and technical baselines. On the other hand, integrating technology that is not fully mature into a project greatly increases the risk of cost increases and schedule delays. According to industry experts, correcting problems after a project has begun can cost 10 times as much as resolving technology problems beforehand.

DOE's project management guidance issued in October 2000 is consistent with these best practices. The guidance discusses technology development and sets out suggested steps to ensure that new technology is brought to a sufficient level of maturity at each decision point in a project. For example, during the conceptual design phase of a project, "proof of concept" testing should be performed before approval to proceed to the preliminary design phase. Furthermore, the guidance states that attempting to concurrently develop the technology and design the facility for a project poses ill-defined risks to the project.

Nevertheless, as we discussed earlier, DOE sites continue to integrate immature technologies into their projects. For example, as discussed earlier, DOE is constructing a facility at the Hanford Site to separate highlevel waste components, although integrated testing of the many steps in the separations process has not occurred and will not occur until after the facility is completed. DOE, trying to keep the project on schedule and within budget, has decided the risks associated with this approach are acceptable. However, there are many projects for which this approach created schedule delays and unexpected costs. The continued reliance on this approach in the face of so many past problems is a signal of an area that needs careful attention as DOE proceeds with its management reform efforts. At present, no DOE management team is addressing this issue.

*Facility Construction Starts before Design Is Sufficiently Developed*

Finally, we have concerns about DOE's practice of launching into construction of complex, one-of-a-kind facilities well before their final design is sufficiently developed, again in an effort to save time and money. Both DOE guidance and external reviews stress the importance of adequate upfront planning before beginning project construction. DOE's project management guidance identifies a series of well-defined steps before construction begins and suggests that complex projects with treatment

<sup>12</sup>U.S. General Accounting Office, *Best Practices: Better Management of Technology Development Can Improve Weapon System Outcomes*, GAO/NSIAD-99-162 (Washington, D.C.: July 30, 1999).

processes that have never before been combined into a facility do not lend themselves to being expedited. However, DOE guidance does not explicitly prohibit a fast-track—or concurrent design and construction—approach to complex, one-of-a-kind projects, and DOE often follows this approach. For example, at the Hanford Site, DOE is concurrently designing and constructing facilities for the largest, most complex environmental cleanup job in the United States. Problems are already surfacing. Only 24 months after the contract was awarded, the project was 10 months behind schedule dates, construction activities have outpaced design work causing inefficient work sequencing, and DOE has withheld performance fee from the design/construction contractor because of these problems.

DOE experienced similar problems in concurrent design and construction activities on other waste treatment facilities. Both the spent nuclear fuel project at Hanford and the waste separations facility at the Savannah River Site encountered schedule delays and cost increases in part because the concurrent approach led to mistakes and rework, and required extra time and money to address the problems.<sup>13</sup> In its 2001 follow-up report on DOE project management, the National Research Council noted that inadequate pre-construction planning and definition of project scope led to cost and schedule overruns on DOE's cleanup projects.<sup>14</sup> The Council reported that research studies suggest that inadequate project definition accounts for 50 percent of the cost increases for environmental remediation projects. Again, no DOE team is specifically examining the “fast-track” approach, yet it frequently contributed to past problems and DOE continues to use this approach.

#### CONCLUSIONS

DOE's efforts to improve its highlevel waste cleanup program and to rein in the uncontrolled growth in project costs and schedules are important and necessary. The accelerated cleanup initiative represents at least the hope of treating and disposing of the waste in a more economical and timely way, although the actual savings are unknown at this time. Furthermore, specific components of this initiative face key legal and technical challenges. Much of the potential for success rested on DOE's ability to dispose of large quantities of waste with relatively low concentrations of radioactivity on site by applying its incidental waste process. Recently, a court ruled that the portion of DOE's order setting out its incidental waste determination process violates the Nuclear Waste Policy Act and is invalid. Thus, DOE is precluded from implementing this element of its accelerated initiative. Success in accelerating cleanup also rests on DOE's ability to obtain successful technical performance from its as-yet unproven waste separation processes. Any technical problems with these processes will likely result in costly delays. At DOE's Hanford Site, we believe the potential for such problems warrants reconsidering the need for more thorough testing of the processes, before completing construction of the full-scale waste separation facility.

DOE's accelerated cleanup initiative should mark the beginning, not the end, of DOE's efforts to identify other opportunities to improve the program by accomplishing the work more quickly, more effectively, or at less cost. As DOE continues to pursue other management improvements, it should reassess certain aspects of its current management approach, including the quality of the analysis underlying key decisions, the adequacy of its approach to incorporating new technologies into projects, and the merits of a fast-track approach to designing and building complex nuclear facilities. Although the challenges are great, the opportunities for program improvements are even greater. Therefore, DOE must continue its efforts to clean up its highlevel waste while demonstrating tangible, measurable program improvements.

In the report being released today, we made several recommendations to help DOE manage or reduce the legal and technical risks faced by the program as well as to strengthen DOE's overall program management. DOE agreed to consider seeking clarification from Congress regarding its authority to define some waste as incidental to reprocessing, if the legal challenge to its authority significantly affected DOE's ability to achieve savings under the accelerated initiative. Regarding our recommendations to conduct integrated pilot-scale testing of the separations facility at Hanford before construction is completed, and to make other management improve-

<sup>13</sup> For a discussion of the problems associated with the fast track design/build approach on these projects, see U.S. General Accounting Office, *Nuclear Waste: DOE's Hanford Spent Nuclear Fuel Storage Project Cost, Schedule, and Management Issues*, GAO/RCED-99-267 (Washington, D.C.: Sept. 20, 1999) and *Nuclear Waste: Process to Remove Radioactive Waste From Savannah River Tanks Fails to Work*, GAO-RCED-99-69 (Washington, D.C.: Apr. 30, 1999).

<sup>14</sup> National Research Council, *Progress in Improving Project Management at the Department of Energy* (Washington, D.C.: Nov. 2001).

ments to address the weaknesses I just discussed, DOE's position is that it has already taken appropriate steps to manage the technology risks and strengthen its management practices. We disagree and believe that implementing all of our recommendations would help reduce the risk of costly delays and improve overall management of DOE's entire high-level waste program.

Thank you, Mr. Chairman and Members of the Subcommittee. That concludes my testimony. I would be pleased to respond to any questions that you may have.

Mr. GREENWOOD. Thank you very much. I appreciate that.

The Chair recognizes himself for 10 minutes for questioning. Let me start with you, Ms. Roberson.

Other DOE sites and other countries have found grout to be the best solution for disposing of low activity waste, including at the Savannah River Site. So why has DOE agreed to vitrify low activity waste at Hanford?

Ms. ROBERSON. Mr. Chairman, we are looking at a number of technology alternatives to stabilize material, and grout is still one of those that we are evaluating in conjunction with our regulators for some material.

Mr. GREENWOOD. Well, then, is it not the case that DOE has agreed to vitrify low level activity waste at Hanford?

Ms. ROBERSON. The DOE commitment that preceded this program was to—I think I am going to look to our site manager—to vitrify—

Mr. GREENWOOD. If you would identify yourself and—

Ms. ROBERSON. Right.

Mr. GREENWOOD. Just so you know what your options are. If you would like to do it this way, if you would like the gentleman to identify himself, take the oath and take the microphone, we can do it that way. So it is your call.

Ms. ROBERSON. I was pretty sure I knew the answer. But I wanted to check with him. Our commitment is to vitrify all of the high-level waste at Hanford. We are working with our regulators to look at alternative stabilization techniques, one of those being grout for some material. And we have a schedule and we are working through that with our regulators at Hanford.

Mr. GREENWOOD. To whom did you make the commitment to vitrify the low level waste at Hanford?

Ms. ROBERSON. This was a regulatory commitment that predated our accelerated cleanup agreement.

Mr. GREENWOOD. So if you want to reverse directions and look for less expensive options, such as grout and I think you have indicated others, what would you have to do? Would you have to issue new regulations in order to do that?

Ms. ROBERSON. No. What we would need to do is convince our regulators and the public that we have technically defensible and sound environmentally other options, and that is what we are working with them to do.

Mr. GREENWOOD. Is there any reason to believe that using grout as an alternative to vitrifying the low level waste would not be safe and efficient.

Ms. ROBERSON. I have no reason today to believe that that would not be a safe, environmentally protective option for some of the waste.

Mr. GREENWOOD. Do you know what your timetable is to make that decision?

Ms. ROBERSON. 2005. We are working through a testing program to develop our technical basis. Actual results of characterization of certain stabilized materials, using those techniques will be sometime in 2005.

Mr. GREENWOOD. Okay. Under your accelerated initiative, DOE expects to save up to \$20 billion at the Hanford Site. In 1996, DOE estimated total project costs at the Hanford vitrification plant would be \$3.2 billion. Only 2 years later, in 1998, project costs increased to \$4.2 billion just to design and construct the facilities.

As of April 2003 costs increased another \$1.6 billion to a total of \$5.8 billion, and the project is 10 months behind schedule. How does DOE believe it can achieve savings given this track record of increasing project costs and schedule delays?

Ms. ROBERSON. A large segment, Mr. Chairman, reflected in the cost increase is our accelerated strategy for disposition of the contents of waste in the tank farm. Previously, the strategy was multiple vitrification plants. We have relooked at our design. We have worked with our contractor. We have worked with our regulator and we believe that construction of one vitrification plant as we have laid out will meet our needs, and thus overall, is a cost savings to the program.

Mr. GREENWOOD. So would I be right in characterizing this as a case where you are front-loading the costs, you are going to have larger costs in the earlier years to achieve lower costs over the life of the project?

Ms. ROBERSON. That is exactly right. That is one element of the cost savings. That is not all of it, but it certainly is one element. And we have modified our designs such that our through-put can meet our needs and will not require construction, we believe of additional vitrification plants.

Mr. GREENWOOD. Okay. In your testimony, you indicate that, "the recent court decision in the Idaho District Court will significantly hinder our ability to implement the accelerated cleanup program." You had estimated \$20 billion in potential cost savings with the high-level waste program. Are these savings achievable if the Idaho District Court rulings stand?

Ms. ROBERSON. Mr. Chairman, we are still—our legal staff is still trying to understand the potential impact of the Idaho District Court ruling. So I am not really prepared to explain the extent of the impact. But, clearly it could have a significant impact, not just at Hanford, but at our other sites as well too.

Mr. GREENWOOD. Is the Department considering appealing that Idaho District Court ruling?

Ms. ROBERSON. I think the Department is considering all options available to it. It simply hasn't made a decision yet.

Mr. GREENWOOD. And has the Department asked Congress to clarify the law?

Ms. ROBERSON. We are working with Congress in regard to clarifying the law. And we are in agreement with the GAO's recommendation in seeking that clarification.

Mr. GREENWOOD. This committee has jurisdiction over that issue. And so with whom on this committee are you having discussions about new legislation?

Ms. ROBERSON. I don't know if we have had the opportunity to talk with Dwight. I would need to check with our legal staff who have been in front of that.

Mr. GREENWOOD. Well, you are welcome in my office any time to discuss changing the law.

Ms. ROBERSON. Thank you, sir.

Mr. GREENWOOD. Let me turn to Ms. Nazzaro for a moment. GAO has had concerns for several years about DOE's practice of using fast-track approaches on complex cleanup projects where facilities are designed and constructed simultaneously. In fact, this was the problem with the Pit 9 projects that this subcommittee investigated in 1997.

Can you elaborate on why this fast track approach is risky for the Hanford vitrification facility?

Ms. NAZZARO. Well, in general, what you are doing is you are going ahead and building a facility without fully testing the technologies that will be incorporated there. So certainly you run the risk of having to retrofit after the fact.

This same process was used at the Savannah River Site and did result in further delays and additional costs.

Mr. GREENWOOD. Well, in terms of testing and technology, are we inventing a wheel here? I mean, is this brand new technology that has not been tried and tested elsewhere, either in this country or other countries?

Ms. NAZZARO. Each of these sites is unique as far as the make up of the waste and what they are going to do as far as their strategies for dealing with the waste. So, they are really one of a kind facilities.

Mr. GREENWOOD. Ms. Roberson, why don't you respond to that. GAO has said that you are kind of building the airplane as you fly it along. What is your take on it?

Ms. ROBERSON. Well, I agree with GAO if that is the approach that you employ, that certainly increases your risk in a project. I would like to make two points however. One is that there is a fundamental difference between the first of a kind separations process at Savannah River and the current Hanford separations process strategy.

The Savannah River separations process was one that relied on both the technical approach not used in other government or commercial applications and reliance on the chemical agent not readily available in commercial scale quantities.

Additionally, no extensive testing of that process using simulated waste was performed. The Hanford approach relies on various components. Evaporators, filters, ionic exchange units, that have successful operational history within DOE and the commercial industry.

A pilot plant would do little to reduce process uncertainties such as actual filtration rates because of the wide range of Hanford tank waste requiring treatment. We are attempting to mitigate any risk for the Hanford separations process by performing tests at the Savannah River Technology Center in which each unit is pilot tested and the product and recycle streams produced are collected and process tested in the receiving unit.

This simulates the plant design in that the products from each unit operation will be collected in tanks and staged before being fed to the next unit operation. Thus, we believe that we have—that we are achieving integrated testing of our operation before we are too far down the road in construction.

Also, in April 2003, with the majority of the design done, as I talked about earlier, we integrated our accelerated strategy with our project design. We also evaluated our risk at that point and we believe we eliminated a significant number of the technical risks that had been standing, which is in conjunction with our project management process. So, we believe that we are taking the necessary actions to mitigate risk in this project which would exist in any project.

Mr. GREENWOOD. One final quick question for this round. This committee has found that the Department of Energy, in employing contractors, has frequently found that both Department employees and contractor employees are given credit cards. And there has been massive abuse by those credit cards by DOE employees and DOE contractor employees. Do you know if in this program, you have examined the utilization of credit cards and checked your system to see whether in fact you are subject to that kind of abuse?

Ms. ROBERSON. I believe last fall, following concerns raised, not necessarily in Department of Energy, the Department of Energy undertook a fairly extensive evaluation of credit card usage across the Department. And, as I recall, the results for the environmental management program and its contractors was pretty good, in that the management controls in place were effective.

Mr. GREENWOOD. My time has expired. The gentleman from Florida.

Mr. DEUTSCH. Thank you, Mr. Chairman. Ms. Roberson, with regard to DOE's plan to test separation technology at Hanford after the full facility has been constructed, the GAO finds that, and I quote, this approach does not fully reflect DOE's guidance, which calls for ensuring that newer complex technology is mature before integrating it into a project. Is that an accurate statement?

Ms. ROBERSON. As I stated earlier, the Department does disagree with that characterization. And we believe that we are undertaking an integrated testing approach. We are not building a pilot plant, but we are conducting integrated testing at the Savannah River Technology Center.

We also believe that the components of this process do have commercial success to build upon, and are not first of a kind.

Mr. DEUTSCH. Okay. Why would the Department stray from its own project guidelines?

Ms. ROBERSON. I don't believe that we are straying from our own project guidance.

Mr. DEUTSCH. Can you comment on that, Ms. Nazzaro?

Ms. NAZZARO. Yes. Our interpretation of what they are doing is they are simulating integration, they are not fully integrating. So until you have a full integration, you still have a fairly high level of risk.

Mr. DEUTSCH. All right. According to the GAO, both in the report and in testimony, DOE should conduct integrated pilot scale testing at the separation facility at Hanford before completing full

scale construction. GAO believes that while DOE has experience with individual separation technologies, a thorough understanding of the integrated process is necessary.

DOE responds that this is—that it has adequate experience with the technologies involved, the technologies are mature, and that pilot testing of individual components in the laboratory is adequate to mitigate any risk. Is this an accurate summary of both GAO and DOE's position on this point?

Ms. ROBERSON. Yes, for DOE.

Ms. NAZZARO. Yes, it is. And we have a number of expert endorsements behind that statement.

Mr. DEUTSCH. Okay. Now, moving on to an example in the GAO report, we find that situation of Savannah River's experience with the waste separation technology called in-tank precipitation. In that case, GAO found that after \$500 million, 15 years successful lab tests and the use of supposed-to-be mature technology, the project was a bust. It took an additional \$1.8 billion and 7 years to address the problem.

Ms. Roberson, I assume before this debacle at Savannah River began, that DOE felt it was on safe ground, relying on a process that looks very similar to what you envision for Hanford; is that correct?

Ms. ROBERSON. Well, Congressman Deutsch, I wasn't in the Department at that time. But we certainly have tried to learn those lessons that resulted from that experience as well as others. And we have done that by making sure that we integrated our expertise, people resources, capability, and experience in the design and construction and review of the vitrification plant at Hanford.

Mr. DEUTSCH. So now that the DOE has experience with the similar project that went horribly, you know, poorly, it doesn't stand that DOE has learned from its mistakes. The GAO finds that the DOE is pursuing a similar strategy at Hanford, and that several experts with whom we have talked caution that if the separation processes at Hanford do not work as planned, facilities will have to be retrofitted and potential cost increases and schedule delays will be much greater than any associated with integrated processing testing at a pilot facility.

Ms. Roberson, given all that has happened at Savannah River with enormous cost overruns and delays, combined with the GAO findings, how can DOE possibly justify not conducting integrated pilot scale testing?

Ms. ROBERSON. We believe we are conducting integrated testing of the operational components of this system. We believe that that is adequate to mitigate the risk of past experience.

Mr. DEUTSCH. I mean, again the distinction that Ms. Nazzaro talked about, the simulated testing, Ms. Nazzaro, in your report, you state that numerous experts have proposed constructing and operating an integrated pilot scale facility; is that correct?

Ms. NAZZARO. Yes. And contractors themselves also endorsed that process.

Mr. DEUTSCH. Can you list some of those experts that you consulted?

Ms. NAZZARO. I just wanted to check whether I could mention their names, sir, that we have cleared them, this with them. We

had Milton Levenson, who is a retired vice president of Bechtel. He is also a member of the Board of Radioactive Waste Management of the National Research Council.

Allen Croff is a division director of chemical technology at Oak Ridge National Laboratory and a consultant to the Committee on Remediation of Buried and Tank Wastes. Ed Lahoda, who is a consulting engineer with Westinghouse Science and Technology Department in Pittsburgh, and is a member of the Committee on Long-Term Research Needs for high-level waste at the Department of Energy sites of the Board of Radioactive Waste Management.

Greg Chopin, a Distinguished Lawton Professor of Chemistry who is retired; also a member of the Board on Radioactive Waste Management. Martin Steindler, director of the Chemical Technology Division at Argonne National Laboratory, also a member of the Board on Radioactive Waste Management, and Roy Gephart, a senior program manager of Chemical Structure and Group Dynamics at the Environmental Molecular Science Laboratory at the Pacific Northwest National Laboratory.

We also had within our employ George Hinman, Doctor of Science in Physics, and Professor Emeritus at Washington State University.

Mr. DEUTSCH. You state that the DOE officials at Hanford acknowledge that the pilot facility could be included in the project without extending the project schedule; is that correct?

Ms. NAZZARO. Yes. That is correct. The original intent was to do it in project development.

Mr. DEUTSCH. Ms. Roberson, you can, no doubt, understand the skepticism that some members of the subcommittee may have given the Department's track record on this issue. We all want this waste disposed of in the safest, most efficient manner. And this report raises serious concerns about DOE's ability to achieve this result. I hope you will give serious consideration to the GAO's recommendation regarding pilot testing and management practices. I yield back.

Mr. WALDEN [presiding]. The gentleman yields back his time. The Chair would yield himself the appropriate 10 minutes.

Ms. Roberson, I noted that as I have had a chance to look through the GAO audit, and I would admit I haven't had a lot of time yet since it has just come out, but that there seems to be a continuing issue about management weaknesses that has been identified for some time in prior audits. And the GAO indicates that those weaknesses would seem to be continuing in management. They are concerned. I think I am characterizing that correctly.

Can you speak to what your view of that is and what—how you think those management weaknesses need to be addressed?

Ms. ROBERSON. Yes. Yes, sir, I would be glad to. I guess quite frankly there are a number of points that I would like to make; one specific to this project. As I stated earlier, for the River Protection Project, we have taken the time to really look closely at our approach, the schedule for design and construction, and the April 2003 baseline that has been provided to Congress, takes into consideration lessons learned from previous projects, and really fol-

lowing very closely our project management order and guidance in the Department of Energy.

And we made adjustments to our design and construction schedule to ensure that our confidence was high, that our risks were mitigated in that process. And it is probably one of the few projects that we have organized in a way that has an 80 percent confidence of success, which is the recommended level of confidence, both financial and operational for a DOE project.

So I think that we have taken the technical and operational challenges very seriously—management in general. We have, since the Secretary issued the Top to Bottom Review, I mean, the Department itself acknowledged that reform of this program was essential.

Mr. WALDEN. And well overdue.

Ms. ROBERSON. And well overdue. And for the last year and a half, every action we have taken has been in support and centered on the premise that those reforms were not just going to be ideas or policies or statements, but actual implementation.

I suspect that the GAO and others will continue until they see the hard results. That is why, in my opening statement, I think it is always important to put before people what actual risk reduction environmental protection is occurring at our sites on the ground. I could probably sit here and talk until I am blue, but the only thing that is going to matter are the actual results that we accomplish. And this is my experience at other projects in the Department as well.

Mr. WALDEN. Good. I would commend the Department for the changes that have taken place. I live in a little town of Hood River, Oregon. It is about 150 miles downstream in the Columbia River from the Hanford. I have lived near the Hood River nearly all of my life. I must tell you there have been times where what we have been told about what was happening at Hanford hasn't turned out to be exactly truthful.

There are many people in my community who remain skeptical, even with the changes, about what is going on there, and remain, I think, in many ways, justifiably concerned about the fact that this highly radioactive material is sitting in tanks that have been leaking or burping, and that what is leaking may be headed right into the Columbia River at some point if we don't get this cleaned up.

And so obviously I have a personal and deep concern about making sure this is done right and right the first time, and that the proper testing is done to make sure it works.

Now, in the testimony from the folks from Washington State, I don't know if you have had a chance to read it or not—

Ms. ROBERSON. I have not.

Mr. WALDEN. But they commend the changes that have taken place at DOE. But they do raise an issue about an incentive program of paying a million dollars a tank to close smaller low risk tanks, that they don't agree with that concept, that we may not be actually targeting what we need most, which is to, I think, deal with the higher waste. It is not necessarily a true measure.

They contend a wiser choice would be investing in treatment and retrieval capabilities that will optimize risk reduction.

Can you explain to me why you think paying a million dollars per tank to close smaller low risk tanks is the best use of funds?

Ms. ROBERSON. Well, I can't say that I know the exact amount of the incentive fee. But for discussion purposes, using a million is fine.

Mr. WALDEN. Sure.

Ms. ROBERSON. I would say that we consider completing our work in the tank farm to be the most important element, and that all of the waste in the tanks, removal, remediation following removal is the important element. And we are starting—the way our program is designed, we start at both ends. We are building a vitrification plant that is designed to handle the high-level waste. On the other side, we are also removing waste from single-shell tanks. And so our strategy for accelerating cleanup of the tank farm is to work both ends at the same time. We think that is a reasonable approach supported by science and engineering capability.

Mr. WALDEN. Ms. Nazzaro, would you comment on that issue?

Ms. NAZZARO. Yes. I would like to actually take a moment to commend Ms. Roberson as well as the Department of Energy. Because we agree that the steps that they are taking are appropriate steps and they are good steps and they are good first steps.

Our point in making—in reiterating our concerns as far as the program management is that maybe they haven't gone far enough, and that we would like to see them, you know, keep pushing in this direction, particularly in the areas of rigorous analysis before making key project decisions, sufficiently testing new technologies and evaluating the appropriateness of this concurrent design-build strategy.

Mr. WALDEN. That is pretty strong language in your report.

Ms. NAZZARO. Right. These are things that we have been supporting for some time. And we do see that DOE is taking first steps to move in these directions. We just don't think they are there yet and we would like to see more being done.

Mr. WALDEN. Ms. Roberson, do you disagree with that?

Ms. ROBERSON. No. I would say that we have problems to solve. Until those problems are solved, solutions implemented and done, we continue to have challenges, management challenges. I don't foresee a time that won't be the case.

Some of the other things that we are doing that are also pointed out in the GAO report, which we appreciate, and will continue to emphasize is, we have developed a specific project team for helping us to validate and improve our strategy for cleanup of high-level waste. We have formed 10 teams across the complex. And those teams are producing results that we believe will further improve our ability to achieve the results that we have laid out. There will continue to be challenges until the problems are solved. There is no doubt in my mind. And that will continue to be a management challenge until that occurs.

Mr. WALDEN. In the GAO recommendations, it indicates here that you disagree with the need to conduct integrated testing of the Hanford waste separation technology. You just don't think that is—

Ms. ROBERSON. We do not believe that it is necessary to build a pilot-scale plant.

Mr. WALDEN. Because you can use best practices?

Ms. ROBERSON. Because—you can call it simulated. We are doing testing of the operational components of the plant and integrating the results of those.

Mr. WALDEN. I guess the biggest challenge that people like me have in the job is sorting out when one certified smart person and team says you should do it, and another group says, we are doing it and it will be fine. How do we know, and there is so much on the line in terms of public health and public tax dollars here, I mean, right across the river in my district, we are also building a facility to destroy one of the Nation's stockpiles of chemical weapons.

And, I mean, there has been enormous testing that has gone on and in other facilities around the country, around the world. And, you know, they have incorporated in using those actual facilities, what—the lessons learned in the design of this facility. It hasn't just been simulated. How do I know that your simulated tests are going to do the job?

Ms. ROBERSON. Well, we believe that it will do the job based upon the results. But the components of the systems that we are testing also have commercial success behind them. They aren't one of a kind, or first of a kind.

Mr. WALDEN. Ms. Nazzaro, do you care to comment on that, because that is the heart of the matter here.

Ms. NAZZARO. We would agree that certain components have been utilized in the past. Our issue is with the integration, will they work together? We are not saying it won't work. But we are saying if you want to minimize risk, this isn't a good strategy, it has not been successful in the past.

Mr. WALDEN. That is the troubling part in your report, is that you indicate that has been tried in the past, it has not worked. And we are going down perhaps the same path.

Ms. NAZZARO. Correct.

Mr. WALDEN. What is at risk here?

Ms. NAZZARO. Well, the whole acceleration of the program is at risk, whether you will achieve the savings, and not in terms of just dollars, but also in time. Because if you have to retrofit, you are going to certainly have to spend more time and you are going to incur more dollars, more cost.

Mr. WALDEN. And where this has happened before, what kind of cost and time delays have you seen?

Ms. NAZZARO. I don't have the exact specifics on—at Savannah River, I was told that the initial cost was \$500 million and the cost to redo is estimated at \$1.8 billion.

Mr. WALDEN. Okay. My time has expired. The gentlewoman from Colorado.

Ms. DEGETTE. Thank you, Mr. Chairman. I think it is very important that this subcommittee is continuing our vigorous oversight efforts over the Department of Energy's cleanup efforts for radioactive high-level waste. And the chairman is back just in time for me to thank him for holding this hearing.

This is a huge budget, as we just heard, with the environmental management program spending over \$7 billion each year cleaning up the hazardous waste created during the cold war years for

weapons production activities. These radioactive materials have inherent risks for the workers and for the people who are transporting these materials. We are talking about a cleanup program that is projected to stretch decades into the future, 70 years by most accounts.

I am hoping that Mr. Greenwood and I will not be here in 70 years continuing to have oversight over this program. But, I think it is critically important that we continue our vigorous oversight activities, especially in view of the recent U.S. District Court decision in Idaho which granted the petition for summary judgment filed by the Natural Resources Defense Council.

And as a former lawyer myself, what struck me was that the court granted the motion on summary judgment. So it seems clear to me that they thought that there was no big issue of fact here, and what they were really deciding was, the authority of DOE, under the Atomic Energy Act, as a matter of law. And that is kind of the direction I want to go in my questions a little bit.

I first want to ask Ms. Roberson, in your testimony, you say that Congress should enact legislation to reaffirm its intent regarding DOE's authority to make determinations about disposal of reprocessed waste. My first question is whether I am correct in understanding that the Department is asking Congress to essentially reverse the decision of the U.S. District Court in Idaho. Is that really the Agency's intent?

Ms. ROBERSON. No, that is not the Agency's intent.

Ms. DEGETTE. What is the intent or the hope?

Ms. ROBERSON. What the Department is asking, and GAO recommended is that Congress clarify its intent. The judge's ruling is based upon its understanding and interpretation of what Congress intended.

Ms. DEGETTE. But that would have the effect, if Congress passed additional legislation, of reversing the Court's decision.

Ms. ROBERSON. If that is what Congress intended. If—I am sorry.

Ms. DEGETTE. No. My next question is, do you have specific legislative language that you can give to us. Because as you well know, and as your people well know, this is a very murky area and requires very clear drafting.

Ms. ROBERSON. We are prepared to work with the committee staff and provide recommended language.

Ms. DEGETTE. Okay. I would ask unanimous consent if they could provide us that recommended language. What kind of timeframe are you looking at, Ms. Roberson?

Ms. ROBERSON. That we could provide you recommended language?

Ms. DEGETTE. Yes. I don't want to ask you to do something in a timeframe that is unreasonable.

Ms. ROBERSON. I believe—I would like to check with our general counsel, but certainly within a week we could do that.

Ms. DEGETTE. Great. That would be great. I would ask unanimous consent then that the Department provide both staffs with this language within 30 days.

Ms. ROBERSON. Okay. Thank you.

[The material appears at pg. 69.]

Ms. DEGETTE. The next question I have for you, Ms. Roberson, in your testimony you respond to some of GAO's concerns by saying that you do calculate uncertainty. Could you expand on this declaration a little bit for me?

Ms. ROBERSON. Okay. That the specific reference then to—involves some disagreement as to what the calculated savings are. The methodology that we use to calculate our savings is the same methodology used in the annual independent environmental liability cost estimate for the Department.

Ms. DEGETTE. How do you do that? What factors enter into that?

Ms. ROBERSON. They are actual baseline reviews that are conducted to validate the cost estimate that we believe applies to the work. And there is also a model for calculating uncertainty. And so there is an uncertainty estimate that is an element of the cost estimate for the program.

Ms. DEGETTE. That is a mathematical model that the Department uses?

Ms. ROBERSON. Yes.

Ms. DEGETTE. Okay. Can you give me some examples of how you would calculate that uncertainty?

Ms. ROBERSON. I can. Well, we obviously base our cost savings on resource-loaded schedules that reflect inflation. For example, a dollars worth of work today will cost a dollar escalated by 10 years of inflation if the same work is performed in 2013.

Ms. DEGETTE. I am a little confused, because I guess I am not understanding how that is calculating uncertainty. Maybe we are not understanding each other.

Ms. ROBERSON. There is a model used to calculate uncertainty that is reviewed independently by the auditors who perform the Department's environmental liability cost estimate. And that is the same model that applies to this work, to calculate the uncertainty.

Ms. DEGETTE. Okay. And that model that you are using was developed in what context?

Ms. ROBERSON. Well, I am—I would actually like to have our CFO to help me respond to that. I could follow up. I am just not savvy enough in that skill area.

Ms. DEGETTE. If we could ask, Mr. Chairman, I would ask unanimous consent that the Department supplement us with that information about what that model is, and what factors go into that model. That would be very helpful.

[The following was received for the record:]

There is uncertainty associated with the development of life-cycle cost estimates for completing the Environmental Management (EM) cleanup program. The major factors contributing to the uncertainty include incomplete knowledge of the types and quantities of contamination, the degree of innovation required to remediate the problems, and the fact that many problems addressed by the EM program are complex and "one of a kind" situations.

In 1999, EM developed a statistical model to aid in the calculation of cost uncertainties in the life-cycle cost of the EM program. The model is based primarily on a study on the cost of environmental restoration projects undertaken in the 1990s. This study found that the cost uncertainty range for environmental projects could range from -50 to +175 percent compared to the original cost estimate. For example, if the initial cost estimate for a project was \$1,000, the cost range for the completed project would be \$500 to \$2,750. In addition, the study found that there are three major factors that affect cost uncertainty for environmental projects—project definition (i.e., how well the project and what needs to be accomplished is understood and defined at the time of the cost estimate), the complexity of the project, and the de-

gree of innovation required for the project. The study also found that project definition contributes 50 percent to the uncertainty range, complexity 22 percent, and innovation 28 percent.

Based on the results of this study, EM developed a system whereby each EM project is rated by the Field Project Manager on a scale of 1 to 5 (where 5 equals maximum uncertainty and 1 equals minimal uncertainty) for the three uncertainty factors (project definition, complexity, and innovation). Using these uncertainty scores, a high- and low-cost range is calculated for each project. These project cost ranges are then loaded into a Monte Carlo probabilistic simulation computer program and a cost uncertainty profile is developed for the EM program as a whole. The mid-point of the uncertainty profile (the most probable cost) is taken as the uncertainty contingency for the EM program.

EM has used this model in calculating its environmental liability since 1999 and the results have been used for the Department's audited financial statements.

Ms. DEGETTE. Let me ask both you and Ms. Nazzaro about whether the DOE had a backup plan in place to deal with the now very real possibility that the courts would find the agency lacked the authority to move forward with its plans.

Ms. ROBERSON.

Ms. ROBERSON. Let me just clarify two things.

One, the Department is still trying to understand what the implications of the ruling of the judge in the Idaho District Court is and what its impact would be on our program.

Second, the court ruling invalidated a section of our DOE 435 waste management order, and that section applies to waste incidental to reprocessing—process that is captured in that order. The DOE 435 Order captured longstanding processes to remove waste from the tanks, treat those wastes and then characterize waste streams according to radioactivity, the heatload and isotopic composition. We are trying to understand what the implications of that ruling are.

Ms. DEGETTE. Here is the thing that is puzzling me. If you are trying to understand the implications of the ruling, how is it Congress is then supposed to go back in and clarify the language of the statute, if you don't even know what the implications of the ruling are. How can we meaningfully fix the problem?

Ms. ROBERSON. Let me just say simply, the ruling invalidated a portion of our order. And what we would have to do to understand the implications of this is make sure we understand what Congress intended. And if the ruling is accurate in what Congress intended, then we would need to develop a different process under the law. The laws are still our guiding requirement.

Ms. DEGETTE. I understand, but it seems to me that you folks should get an understanding of the ruling before you come back in and have us adjust what our intent is as to what this should do.

Ms. Nazzaro, let me have you answer my question. I am about out of time. And my question was: Did the DOE have a backup plan in place to deal with the possibility that the courts might find that the agency lacked the authority to move forward?

Ms. NAZZARO. I would say no, and that was part of our concern that because of this lawsuit, it certainly could jeopardize the cost savings as well as the acceleration of the program. And that's why at the time prior to the court ruling, we suggested they seek clarification.

Now that the court ruling has been made, we're saying that there may be another option and that option would be for DOE to

ask Congress to provide legislative authority to implement an incidental waste policy. That would be different than what we had originally recommended, and we're not making a judgment as to the validity of the court ruling. We're just saying, let that stand and where do you go from here?

Ms. DEGETTE. Thanks to both—Ms. Roberson.

Ms. ROBERSON. Might I clarify? The DOE 435 order was a cataloging of waste management practices in the Department. There were no new waste management practices generated either in the WIR process or other parts of that order. It was a cataloging of those practices over the last 20 years.

So we haven't generated any new requirement, any new policy, any new process. It is, indeed, the basis for how the Department has managed these wastes and how it believed it would manage them going forward.

Ms. DEGETTE. Thank you. Thank you for clarifying your answer.

Mr. GREENWOOD. The Chair thanks the gentlelady.

The Chair has a couple more questions, and we'll take as much time to answer these questions and then yield similar amounts of time to other members if they choose it.

Ms. Roberson, in the written testimony of David Wilson from the South Carolina Department of Health and Environmental Control, he raises concerns that DOE has proposed to directly dispose of approximately 20 million curies of high-level radioactive waste at the Savannah River Site. The question is can we store these wastes at Savannah safely?

Ms. ROBERSON. What the Site has proposed and is working on with our regulators and parties in the community is strategy to stabilize materials appropriately through a salt processing operation.

Mr. GREENWOOD. What kind of processing?

Ms. ROBERSON. Salt processing. We are working with our regulators. It clearly requires regulatory approval, but we do believe we can do it safely or we would not have proposed it.

Mr. GREENWOOD. If you do that, do you have an estimate of the cost savings you achieve as compared to disposing at Yucca Mountain? I assume that's why you're doing it.

Ms. ROBERSON. We're doing it because we think it is environmentally safe and safe for the workers. The cost impact to Yucca Mountain, obviously, the more material that must be dispositioned for Yucca Mountain will have an impact on that operation, but I can't estimate what the impact would be.

Mr. GREENWOOD. Counsel and I are having a conversation as well, and I would ask each of you to respond to this, what is the impact of the court ruling in Idaho on, for instance, your ability to dispose of the waste at Savannah or the implications apply to all three sites?

Ms. ROBERSON. I have asked this question and our lawyers have asked me not to respond to that until they can make a determination as to its far-reaching impact, if any.

Mr. GREENWOOD. That is understandable.

Ms. Nazzaro your testimony points out that DOE's incidental waste designation process was invalidated by Idaho District Court as we've been discussing. What do you consider to be DOE's alter-

native for dealing with the high-level waste if the court ruling stands and it is not turned over on appeal and if Congress were not to clarify the issue? If they had to live with it, what would their options be?

Ms. NAZZARO. We are suggesting another option and that option is that Congress could actually legislate authority to DOE to implement an incidental waste policy. If they didn't, we are back to square one, because their whole accelerated program, whole clean-up program is based on the separation.

Mr. GREENWOOD. This is a very important question for us. So what I want to understand is if the court ruling stands, if it has the implications that we seem to think that it does and if Congress does nothing, then what becomes of this material? What alternatives exist?

Ms. NAZZARO. It seems that it all has to be treated as high-level waste and would have to be processed and prepared to go to a permanent repository.

Mr. GREENWOOD. It would have to be vitrified and it would have to be taken to Yucca Mountain.

Ms. NAZZARO. Or to some repository. Yucca Mountain doesn't have the capacity to handle all of the wastes that they have. One of my predecessors said that if we had to dispose of all the wastes at Hanford, we would have to build another Hanford. There is so much waste. There is not enough room at Yucca Mountain.

Mr. GREENWOOD. And so the point is, given the realities of Yucca Mountain and how extraordinarily contentious politically, legally and how difficult scientifically, technologically, it has been to try to prepare Yucca Mountain, you would need to go through a similar process. So we're talking probably decades, if at all, before you could find an alternative. So it seems to me that is an option that should not even be under consideration because it is unrealistic.

So the options are really, as I understand them, either the court decision is reversed, or Congress has to go back in and make that clarification so the interpretation then falls the way the Department thinks it was to begin with, and that is they can dispose of it in the way they intended it to.

Ms. NAZZARO. Correct. We have been supportive of the whole separation theory, and we believe it is a prudent strategy because, as you say, Yucca Mountain can't handle it, and the cost would be prohibitive.

Mr. GREENWOOD. Either one of you can respond to this, but the court did not determine that disposing of the materials onsite or disposing of them as the Department had planned to was necessarily unsafe. It just interpreted the law in such a way as to require the more onerous methodology; is that correct?

Ms. NAZZARO. Yes.

Ms. ROBERSON. That is one of the questions we would want clarification on as to whether the court ruling implies that everything—and let me just say that people tend to focus on the liquid in the tanks. But the WIR process, the waste incidental to the reprocessing process in our order applies to tank residuals and tank farm components. It would mean the tanks would need to be cut up and dispositioned; personal protective equipment that workers wore when handling. It is not just about liquids in the tank.

Mr. GREENWOOD. Am I correct in saying that the court did not find as a fact, didn't have expert testimony from witnesses who said what the Department is doing unsafe, it is environmentally unacceptable, it's risky. It wasn't that the court determined that this process was wrong and unsafe, the court looked at the Federal law and said, we think the law intentionally or inadvertently requires the Department to take these extraordinary methods.

Ms. NAZZARO. The law did not differentiate as far as what the waste was. It just basically said that the law states—if it is high-level waste, it needs to be sent to a permanent repository.

Mr. GREENWOOD. Did witnesses come to the court and testify that it was environmentally imperative to do it this way?

Ms. NAZZARO. No. It was a summary judgment as was discussed earlier.

Mr. GREENWOOD. The gentlelady from Colorado is an attorney.

Ms. ROBERSON. Not being a lawyer, but my laymans definition may be helpful. In reading the judge's ruling, what I understand the judge to say is that the judge ruled that our process was not compliant with the law, I think simply put. That what we represented as congressional intent was not what the intent was.

Mr. GREENWOOD. Who brought this case to court?

Ms. ROBERSON. Natural Resources Defense Council and others.

Mr. GREENWOOD. One might assume that they would be in opposition to Congress changing the law.

Ms. ROBERSON. Likely.

Mr. GREENWOOD. The Chair yields the balance of his time and would yield.

Ms. DEGETTE. Thank you, Mr. Chairman.

My understanding of what happened in this lawsuit in the U.S. District Court in Idaho, is that the plaintiff was the Natural Resources Defense Council. They filed a law suit. And what they argued was that under the terms of the Nuclear Waste Policy Act that if you are going to categorize waste as high-level waste, then it has to be sent to that kind of facility and it is going to supersede any other actions. And what the Department is now asking us to do is to clarify the language to determine what their authority is. Would that be accurate?

Ms. ROBERSON. That's correct.

Ms. DEGETTE. And my point is, before we can figure out—and I sort of agree with you, it may not make sense to categorize everything as one way. It may be the way that the statute was written, but we need to be very careful as we go in to start to rewrite the statute, or try to revisit what legislative intent was, to make sure that we write it in the appropriate way. And I think that that's where the GAO has helped, and I think that that is also where the Department needs to provide us with some pretty clear language. So in that vein, Mr. Chairman, I ask unanimous consent if committee staff could, after this hearing, propose some additional legal questions in writing to the Department's general counsel and have those responded to within 2 weeks?

Mr. GREENWOOD. Without objection, the staff will be so instructed.

Ms. DEGETTE. And thank you very much, Mr. Chairman, and I yield back.

Mr. GREENWOOD. Ms. Roberson and Ms. Nazzaro, thank you for your testimony. You are excused.

And that brings our second panel forward, and I would ask Mr. Michael Wilson the Program Director of Nuclear and Mixed Waste Program at Washington State Department of Ecology and Mr. David Wilson the Assistant Chief of the Bureau of Land and Waste Management at South Carolina State Department of Health and Environmental Control. If you gentlemen, Messrs. Wilson, would step forward. We take testimony under oath here. Do either of you object to that? You are both entitled to be represented by counsel. Do you wish to? Raise your right hand.

[Witnesses sworn.]

Mr. GREENWOOD. You are under oath, and we will start with Michael Wilson. You have 10 minutes, sir.

**TESTIMONY OF MICHAEL A. WILSON, PROGRAM DIRECTOR, NUCLEAR AND MIXED WASTE PROGRAM, WASHINGTON STATE DEPARTMENT OF ECOLOGY; AND DAVID E. WILSON, JR., ASSISTANT CHIEF, BUREAU OF LAND AND WASTE MANAGEMENT, SOUTH CAROLINA STATE DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL**

Mr. MICHAEL WILSON. Thank you Mr. Chairman and members of the committee. My name is Mike Wilson and I manage the Nuclear Waste Program for the Washington State Department of Ecology.

At Hanford over 53 million gallons of highly radioactive, highly toxic waste produced in the manufacture of plutonium for the Nation's nuclear defense sits in 177 aging tanks. At least 1 million gallons of these deadly wastes have already leaked into the environment. Some of that waste has reached the groundwater and is heading toward the Columbia River just a few miles away. With that as a backdrop, I am here today to commend the Department of Energy for significant achievements toward our goal of reducing tank waste risk. The Hanford Waste Treatment Plant is under construction and authorized for completion. The Department of Energy, the administration and the Congress have all risen to the challenge and we're grateful. Moreover, during the last several years, there has been a significant culture shift within the Department of Energy. They are now moving aggressively to retrieve and treat the waste rather than baby-sitting an aging, costly storage system. For more than 15 years, the State of Washington has pressed hard for real, lasting risk reduction in the tank farms. And so I especially commend Assistant Secretary Roberson for their focus on accelerating real risk reduction. A key aspect of this change is the use of performance-based contracting. We support aggressive use of incentives to motivate real, appropriate achievement.

I would like to briefly address three issues related to speeding the clean up and reducing costs. First retrieval and treatment. We believe that the tank waste can and will be separated into a highly radioactive portion and a low-activity fraction. The high-level waste will be vitrified and sent to a deep geologic repository and the low-activity fraction, perhaps as much as 90 percent of the total volume, appropriately treated and returned to shallow burial at Hanford in perpetuity. To be acceptable to the State and to the people

of the Northwest, this low-activity waste must be isolated from the environment for as long as it remains hazardous. That's why we have supported vitrification for the low-activity waste, an impervious durable waste form that will not end up in our air, soil, groundwater or the Columbia River.

And I want to make one thing very clear. Leaving large quantities of untreated waste in tanks is not acceptable to the State of Washington. That is not real risk reduction and, at best, it is only risk deferral. And if I might take a little aside here because of the questions raised around the NRDC lawsuit. We entered that lawsuit as friends of the court for two purposes. One is that we felt that over the last several years, the Department of Energy has looked at leaving large quantities of waste in tanks, simply looking inside and waving a wand over them and declaring them either too hard to get out, or too expensive and declaring those no longer high-level wastes. That was one of our concerns.

The other concern on the other side was that as a result of the NRDC suit, we would lose the ability through the pretreatment process to separate the waste into high-level and low-activity fractions and send only that waste to the repository that was declared to be high-level waste. That was another of our concerns, that we would lose that ability.

Second, optimizing treatment capabilities. We won't see significant permanent risk reduction until the treatment plant comes on-line in 2011. Whether that reduction will be accelerated or gradual, less or more expensive, depends on critical decisions and investments in the next few years. We are pleased that the Department of Energy decided to include a second high-activity waster melt in the treatment plant. It means that once treatment starts, a larger volume of the more dangerous tank waste can be treated sooner, resulting in faster risk reduction and substantial life cycle cost savings. However, these benefits can only be achieved if enough low-activity waste can be treated at the same time. This means investing in additional treatment capacity for the low-activity waste now so it can be available at the time treatment begins. This may be in the form of additional treatment plant vitrification capacity, or an alternative technology that meets comparable waste form standard for shallow land disposal at Hanford.

And third, closure is the end, not the beginning. It will be important to properly close tanks and tank farms to prevent long-term risk from the remaining contamination. But until waste is retrieved and treated, closing tanks can only provide marginal fiscal relief and little, if any, risk reduction. While focusing on the near-term closure of tanks, most of the tank waste, including the high-hazard waste, will remain in a mobile form in failing tanks waiting for treatment. To us, progress means risk reduction. Counting the number of tanks closed is a false measure of progress and a false economy. The only true measure of progress is the amount of tank waste treated and sent to appropriate disposal. And it is the only way to ultimately reduce the cost of tank farm management. We do not agree that paying incentives to close small or low-risk tanks makes sense at this time. A wiser choice would be investing in retrieval and treatment capabilities that will optimize risk reduction. We are working with the Department of Energy to define the clo-

sure process. It is important that we maintain our focus on the primary objective which is retrieve, treat and properly dispose of the waste.

Thank you for your attention, and I would be happy to answer questions.

[The prepared statement of Michael A. Wilson follows:]

PREPARED STATEMENT OF MICHAEL A. WILSON, MANAGER, NUCLEAR WASTE PROGRAM, WASHINGTON STATE DEPARTMENT OF ECOLOGY

Mr. Chairman: For more than 15 years the State of Washington has pressed hard for real, lasting reduction of both short- and long-term risks posed by Hanford's 177 underground tanks.

At Hanford, over fifty-three million gallons of highly radioactive, highly toxic waste—produced in the manufacture of Plutonium for the nation's nuclear defense—sits in aging tanks buried less than six feet below the ground.

At least one million gallons of these deadly wastes have already leaked into the environment. Some of that waste has reached the ground water and is heading toward the only salmon spawning beds still left in the Columbia River—just a few miles away.

With that as the backdrop, I am here today to commend the Department of Energy for significant achievements toward our goal of reducing tank waste risk. The Hanford Waste Treatment Plant is under construction and fully authorized for completion. The Department of Energy, the Administration and the Congress have all risen to the challenge, and we are grateful.

Moreover, during the last several years, there has been a significant “culture shift” within the Department of Energy. They are now moving aggressively to retrieve and treat the waste, rather than “baby sitting” an aging, failing, costly storage system. I especially commend Assistant Secretary Roberson for her focus on accelerating real risk reduction.

A key aspect of this change is the use of performance-based contracting. We support aggressive use of incentives to motivate real achievement.

To speed the cleanup of Hanford's tanks and to reduce costs, there are three things that must be addressed:

1. Retrieving the waste from tanks and treating it.
2. Timing our investments to make the best use of the Waste Treatment Plant.
3. Putting tank closure in proper perspective.

*1. Retrieval and treatment:*

We believe that the tank waste can and will be separated into a highly-radioactive portion and a low-activity fraction. The high level waste to be vitrified and sent to a deep geologic repository and the low activity fraction, after appropriate treatment, returned to shallow burial at Hanford, in perpetuity.

To be acceptable to the state and to the people of the Northwest, this low-activity waste must be isolated from the environment for as long as it remains hazardous. That's why we have supported vitrification for the low-activity waste—an impervious, durable waste form that will not wind up in our air, soil, groundwater or the Columbia River.

I want to make one thing very clear. Leaving large quantities of untreated waste in the tanks is not acceptable to the State of Washington. That is not real risk reduction—at best, it is only risk *deferral*.

*2. Timing is crucial to optimal performance and savings*

We won't see significant, permanent reductions in risk until the treatment plant comes on-line in 2011. Whether that reduction will be accelerated or gradual, less or more expensive, depends on critical decisions and investments in the next few years.

We in Washington are very pleased that USDOE decided to include a second high-activity waste melter in the treatment plant. It means that, once treatment starts, a larger volume of the more dangerous tank waste can be treated sooner, resulting in a steeper reduction in risk and substantial life-cycle cost savings.

However, these benefits can be achieved only if enough low-activity waste—perhaps 90 percent of the total volume—can be treated at the same time. In turn, this will require investing in additional treatment capacity for the low-activity waste to be available in, or shortly after 2011.

This additional capacity may be in the form of an additional low-activity vitrification capacity, or a supplemental technology that must produce a comparably stable waste form for shallow-land disposal at Hanford.

This means investing in this additional treatment capacity in the fairly near term—even as the WTP is being built.

Meanwhile, the more modern double-shell tanks have been filled to near capacity. And that will soon constrain our ability to continue emptying the old single-shell tanks. This bottleneck will ease only when the treatment plant comes on-line. Delay may mean the construction of additional tanks. Not as an alternative to treatment but as a necessary addition to the treatment and storage system.

### *3. Closure is the end, not the beginning*

It will be important to properly close tanks and tank farms to prevent long-term risk from Hanford's legacy of contamination. But until waste is retrieved and treated, closing tanks can provide only marginal fiscal relief—and little if any risk reduction.

While focusing on near term closure of tanks most of the tank waste, including the high-hazard waste, will remain in a mobile form, in aging tanks and facilities awaiting treatment. We feel that progress is risk reduction. Counting the number of tanks closed is a false measure of progress and false economy. The only true measure of progress is the amount of tank waste treated and sent to appropriate disposal and the only way to ultimately reduce the cost of tank farm management.

We do not agree that paying incentives of \$1 million per tank to close small or low risk tanks makes sense at this time. A wiser choice would be investing in retrieval and treatment capabilities that will optimize risk reduction.

We are currently working closely with the Office of River Protection to define standards and processes for tank closure. This is appropriate and timely work. But we never lose our focus on the primary objective: retrieve, treat and properly dispose of the waste.

Mr. GREENWOOD. Mr. Wilson.

### **TESTIMONY OF DAVID E. WILSON, JR.**

Mr. DAVID WILSON. Mr. Chairman, members of the committee, good morning.

My name is David Wilson, and I am the Assistant Chief for the Bureau of Land and Waste Management at the South Carolina Department of Health and Environmental Control. Thank you for the invitation to testify at this hearing concerning the Department of Energy's management of high-level radioactive waste stored at the Savannah River Site located in South Carolina.

First, I would like to tell you why this is such an important issue to our State. The Savannah River Site began operation in 1950. During the peak production years of operation, activities included the operation of five nuclear reactors, two chemical separations areas, fuel fabrication and heavy water production. The high-level radioactive waste generated is stored in a series of 51 tanks ranging in size from 750,000 gallons to 1.3 million gallons in capacity. These tanks contain a total of 37 million gallons of highly radioactive waste with a cumulative content of over 400 million curies. This storage activity presents the single most potentially hazardous condition to the environment and the people of South Carolina.

Over the years DOE has worked with the State to develop and implement plans to remove this dangerous waste from the storage tanks and transform it into a waste form that is more stable and suitable for shipment to a national repository for ultimate disposal. This has included the construction and operation of a vitrification facility to convert the liquid high-level radioactive waste into a glass matrix. This process has been successful, and so far approximately 30 million curies of waste has been processed which has allowed for the closure of two of the original 51 storage tanks. Most

recently, the Department of Energy conducted a top-to-bottom review of environmental management activities across its national complex. The result of this review has been the development of site-specific performance management plans that outline how many activities can be accelerated to reduce risk and associated costs.

In general, we have agreed with this concept as evidenced by a letter of intent to work with the Department on this initiative that was signed on May 8, 2002. We have also signed a letter of support for the Savannah River Site Performance Management Plan on May 22, 2003 with one very important exception. That exception deals directly with the management of high-level radioactive waste. As part of the acceleration and cost reduction, the Department of Energy has proposed to directly dispose of approximately 20 million curies of high-level radioactive waste at the Savannah River Site. This is a significant change from previous decisions made by the Department of Energy to only leave residual amounts of high-level radioactive waste onsite. This proposal was made in accordance with DOE Order 435.1. The Department of Energy has determined that this waste is no longer high-level radioactive waste and does not have to be ultimately dispositioned at a national repository as mandated by the Nuclear Waste Policy Act.

As you are aware, a recent Federal Court ruling found that DOE Order 435.1 violated the Nuclear Waste Policy Act and declared portions of the order invalid. We, of course, believe this decision directly impacts any proposal by the Department of Energy to dispose, onsite, a portion of the high-level radioactive waste stored at the Savannah River Site. While we do not believe that it is either technically or economically feasible to send every curie of high-level radioactive waste to a national repository, any proposal to manage residuals of this waste onsite must be subject to full public debate and deliberation prior to any final decision. This debate and deliberation must address what is the acceptable amount of residuals to be managed onsite, how the long-term stewardship issues will be addressed, and the current direction from Congress that all waste of this nature must be permanently dispositioned at a national repository.

Again, thank you for the opportunity to provide these comments, and I look forward to answering any questions you may have.

[The prepared statement of David E. Wilson, Jr. follows:]

PREPARED STATEMENT OF DAVID E. WILSON, JR., ASSISTANT BUREAU CHIEF, LAND AND WASTE MANAGEMENT, SOUTH CAROLINA DEPARTMENT OF HEALTH AND ENVIRONMENTAL CONTROL

Mr. Chairman, members of the committee, good morning. My name is David Wilson and I am the Assistant Chief for the Bureau of Land and Waste Management at the South Carolina Department of Health and Environmental Control. Thank you for the invitation to testify at this hearing concerning the Department of Energy's management of high-level radioactive waste stored at the Savannah River Site located in South Carolina.

First, I would like to tell you why this is such an important issue to our state. The Savannah River Site began operation in 1950. During the peak production years of operation, activities included the operation of five nuclear reactors, two chemical separation areas, fuel fabrication and heavy water production. The high-level radioactive waste generated is stored in a series of fifty-one tanks ranging in size from seven hundred and fifty thousand gallons to one point three million gallons in capacity. These tanks contain a total of thirty seven million gallons of highly radioactive waste with a cumulative content of over four hundred million curies.

This storage activity presents the single most potentially hazardous condition to the environment and the people of South Carolina.

Over the years, DOE has worked with the state to develop and implement plans to remove this dangerous waste from the storage tanks and transform it into a waste form that is more stable and suitable for shipment to a national repository for ultimate disposal. This has included the construction and operation of a vitrification facility to convert the liquid high-level radioactive waste into a glass matrix. This process has been successful and so far approximately thirty million curies of waste have been processed which has allowed for the closure of two of the original fifty-one storage tanks.

Most recently, the Department of Energy has conducted a top to bottom review of all management activities across its national complex. The result of this review has been the development of site specific performance management plans that outline how many activities can be accelerated to reduce risk and associated cost. In general, we have agreed with this concept as evidenced by a letter of intent to work the Department on this initiative that was signed on May 8th, 2002. We have also signed a letter of support for the Savannah River Site Performance Management Plan on May 22nd, 2003 with one very important exception.

That exception deals directly with the management of high-level radioactive waste. As part of acceleration and cost reduction, the Department of Energy has proposed to directly dispose of approximately twenty million curies of high-level radioactive waste at the Savannah River Site. This is a significant change from previous decisions made by the Department of Energy to only leave residual amounts of high-level radioactive waste on site. This proposal was made in accordance with DOE Order 435.1 through which Department of Energy has determined that this waste is no longer high-level radioactive waste and does not have to be ultimately dispositioned at a national repository as mandated by the Nuclear Waste Policy Act.

As you are aware, a recent Federal District Court Ruling found that DOE Order 435.1 violated the Nuclear Waste Policy Act and declared the Order invalid. We, of course, believe this decision directly impacts any proposal by the Department of Energy to dispose, on-site, a portion of the high-level radioactive waste stored at the Savannah River Site. While we do not believe it is either technically or economically feasible to send every curie of high-level radioactive waste to a national repository, any proposal to permanently manage residuals of this waste on-site must be subject to full public debate and deliberation prior to any final decision. This debate and deliberation must address what is the acceptable amount of residuals to be managed on-site, how the long-term stewardship issues will be addressed, and the current direction from Congress that all waste of this nature must be permanently dispositioned at a national repository.

Again, thank you for the opportunity to provide these comments. I look forward to answering any questions you may have.

Mr. GREENWOOD. Thank you.

The Chair recognizes himself for 10 minutes for questioning.

Let me ask both of you. You were here during the previous discussion when we talked about the need to clarify the law, and it appears to me that it is probable that Congress will try to do just that. So my question is: What would your admonitions be to Congress with regard to clarifying the law? Do you support the idea of clarifying the law so that this waste—I think your testimony seemed to indicate that, but I would like you to focus on that.

Mr. MICHAEL WILSON. First of all, I think there is potentially a lot of jumping the gun going on in not yet fully interpreting the court decision. As I said, we had two reasons for going into the case as friends of the court. And we felt that a lot of the information and a lot of the resulting decision contained a lot of information that we had supplied to the judge.

In our initial look, and I will make the usual statement here that I am not an attorney either and my attorneys, however, last week said that they felt there was enough room in this decision with their initial read that we can continue on our way with the intended course at Hanford. My admonition might be that rather than seek clarification from Congress, that first we seek clarifica-

tion from the court. And go from there. We have not yet had a full meeting of the parties after the decision, and to my knowledge that's not going to take place until Monday. So the parties have yet to get—I mean the plaintiffs and friends have not yet gotten together to determine what the real meaning of the decision is among themselves.

Mr. GREENWOOD. Clearly, the State of Washington is not trying to achieve the result that all of this waste has to be stored as high-level waste.

Mr. MICHAEL WILSON. Absolutely not.

Mr. GREENWOOD. What is your understanding of the other plaintiffs? The Environmental Defense Fund want to achieve—the NRDC want to achieve that?

Mr. MICHAEL WILSON. I am not the Attorney General for the State, and I didn't represent the State of Washington. I wasn't part of the talks and so forth that went on as part of that. I'd rather not characterize their position myself and as to the other States, we have at least one of them here.

Mr. GREENWOOD. But you do agree that your intention—you don't think that's how this thing should wind up.

Mr. MICHAEL WILSON. Our purpose in being in there was to protect our interests. And our interests were sort of on both sides of the issue. One is to prevent the Department of Energy from making wholesale declarations that waste could remain in tanks without being treated. And second, that we are able to carry on the proposed plan at Hanford, which is to separate the waste and send what would be the high-activity fraction to the repository. And we have long accepted the fact that a majority of this waste will be appropriately treated and stored at Hanford or disposed of.

Mr. GREENWOOD. And that's the position of South Carolina as well?

Mr. DAVID WILSON. I'll agree with many of the comments that my colleague from the State of Washington has made. We too signed on as a friend of the court during the lawsuit for many of the same reasons. And I'll tell you that, as we move forward through this, either as reinterpretation of the Court's decision and clarifying that, or as Congress looks at this issue, the matter most important to the State of South Carolina is that the State be involved in the decisionmaking process. For us, that was the basic problem with Order 435.1, was that it left to the discretion solely of DOE in making those determinations without specific involvement from the States.

Mr. GREENWOOD. Has this been a hot political issue, for instance, in gubernatorial races and State legislative races and congressional races?

Mr. DAVID WILSON. We're relatively new in a Governor's administration, so there are a lot of State budget issues that are high on the agenda at this point. But certainly this does receive attention.

Mr. GREENWOOD. Hotter than radioactive waste?

Mr. Mike Wilson, you framed your testimony with a statement in the beginning that some of the Hanford tank wastes have reached the groundwater and are heading toward the only salmon spawning beds left in the Columbia River. Is there scientific evidence that the Hanford tank waste has already harmed wildlife?

Mr. MICHAEL WILSON. Not to my knowledge that the tank waste has gotten that far. We have other wastes from the reactor areas that have entered the actual salmon spawning beds in what's called the Hanford Reach, which is the last free flowing stretch of the Columbia River that flows by and through the Hanford Reservation.

Mr. GREENWOOD. Is the Department of Energy doing everything in its power to manage that?

Mr. MICHAEL WILSON. Lots of things being done in that area. This is particularly—not even a radioactive waste issue. It's a chemical or heavy metal problem with chromium that's entering the river. And there's lots of work being done right now to try to prevent that.

Mr. GREENWOOD. You've heard DOE testify that it hopes to save billions with proposed changes in the way it treats and disposes of its high-level wastes. Do you have any concerns about these new accelerated initiatives, either of you?

Mr. MICHAEL WILSON. I'll just restate that I think the contracting method—last year at this time when I was here, I think I praised their new contracting methods also, and we've seen good results from that. I did raise the issue specific to giving incentives to contractors for the right thing. We've seen that given incentives, the contractors work toward those incentives. It is a psychological theory that when you give incentives, you get what you incentivize. So you have to be careful that you are putting the incentives on the right issue. And the issue that was raised earlier about closing tanks gives us some concern. They have put incentives on closing up to or around 26 tanks between now and 2006. Our concern is that Hanford has yet to close one tank, and we are in the process of talking about the process for doing that, that perhaps it's a little bit much to ask to close up to 26 tanks, and perhaps that those incentives could be placed elsewhere.

Mr. GREENWOOD. Again, to you, Mr. Wilson of Washington. As you know, Hanford is building a vitrification facility to treat its low-activity waste fraction. However, other DOE sites in other countries have found grout to be a more economical solution to disposing of their low-activity waste. GAO has pointed out that DOE has not done a rigorous analysis to determine whether grout is a better and more economical alternative that allows safe disposal and meets scheduled dates. What are your States' concerns about using treatment technology such as grout other than vitrification to treat Hanford's low-level waste fraction?

Mr. MICHAEL WILSON. Well, several things. We have got a plant underway that is building vitrification capacity for low-activity waste. We are in a position here in a number of areas of trying to balance our frustration with a decade of delay and in not pushing the Department of Energy to do something stupid. We have had a decade of experience with grout. In one of the earlier permutations of the treatment plant, we looked at grout and found that grout was an inadequate waste form to maintain the integrity of the waste over a long enough period of time. And as I mentioned, we are fully—

Mr. GREENWOOD. When you say you found, what sort of scientific expertise was brought to bear to come to that conclusion?

Mr. MICHAEL WILSON. I have to get back with you on that. There were a number of radionuclides that weren't adequately maintained over a period of time.

Mr. GREENWOOD. Would you submit to the committee that supporting documentation?

Mr. MICHAEL WILSON. Certainly. It goes back to earlier environmental impact statements and so forth over a long period of time. So we are not—so we have a vitrification plant under construction to deal with the low-activity waste. At the same time, we are working with the Department of Energy to look at alternative technologies, additional technologies for dealing with the low-activity waste should that—and should those prove to be as effective as glass in maintaining the integrity of the waste over a long enough period of time, we're open to looking at those also. I know there are some new grout formulations and also some different vitrification technologies now that look like they hold some promise.

[The following was received for the record:]

#### HISTORY OF GROUT AS WASTE FORM FOR HANFORD TANK WASTE

##### WHITE PAPER

##### WASHINGTON STATE DEPARTMENT OF ECOLOGY

A series of decisions resulted in Department of Energy (USDOE) and Washington State moving away from grout for immobilizing Low Activity (after pretreatment separations) portion of Hanford Tank Waste in the early 1990s.

The decision to move from grout to vitrification for low activity waste was based on: technical risk and land use considerations, and on strong public resistance to what was perceived as a risky approach that could not be corrected once set in motion.

- 1) Technical: There were questions raised about the ability of the grout formulation to solidify. Although grout has been used around the world in treating low level waste, it was always done in small containers; or in the case of Savannah River, a series of relatively small pours. Hanford was going to use a single pour of approximately 1.4 million gallons (approximately 1 million gallons of waste and 400,000 gallons of grout formers). Whether a continuous pour could set up uniformly was not clear. Several experts raised questions regarding the heat of hydration, which might be affected by heat generated by radioactive decay. If the grout might not set (solidify), then the construction of very expensive grout vaults, capable of holding liquid grout, would be required. This approach put a high reliance on the engineered barriers in the short term when the waste was liquid and in the long term for the long lived radionuclides. Questions were also raised about the safe retrieval of the grout once it was poured, should retrieval be needed in the future.
- 2) Long Term Performance Assessment or Risk: USDOE's performance assessment order required the long term performance assessment for grout to be modeled based on the maximum contaminant concentration for each constituent (presumably at a point of compliance or at significant receptor(s)). This analysis resulted in identification of three constituents that would ultimately violate drinking water standards. The three constituents (nitrate, Iodine-129, and Technetium-99) violated drinking water standards before and after the 10,000 year timeframe (Performance Assessment of Grouted Double Shell Tank Waste Disposal at Hanford, 1995, WHC-SD-WM-EE-004 Rev. 1). In combination this analysis raised the issue of technical acceptability of grout as a long term waste form.
- 3) Land Use: Grout as a final waste form increases the volume to be disposed significantly. The original grout program projected 44 vaults to contain the low activity portion of waste from Hanford's 28 double shell tanks. In formulating the grout program, USDOE assumed that the waste in the single shell tanks would not have to be retrieved or treated. In 1993, when single shell tank wastes were added to the retrieval and treatment schedule, the number of vaults grew from 44 up to 200. This meant the land consumed by grout disposal vaults would impact large undisturbed areas. This land use impact became a major concern for

the Tribes, regional interest groups, and local governments. These undisturbed areas represented significant shrub steppe habitat and/or areas for future missions and industrial development.

Based on these concerns, the Hanford Waste Task Force (1993), a stakeholder advisory group, concluded (in Appendix F of the report) that “Grout doesn’t adequately protect public, workers and environment” and that “reduction of waste volume was an issue for grout” since grout increases final waste form volume significantly. Recognizing this broad-based public concern about grout, and the potential for low activity waste vitrification at costs that appeared not greatly different from those for grout on a grand scale, Washington State opted for vitrification in negotiating a new set of milestones for tank waste treatment. In return, Washington State agreed to USDOE’s desire to delay construction of the Hanford Waste Vitrification Plant (HWVP) for technical and budgetary reasons.

In the early 1990s, USDOE’s budgetary and scheduling assumptions made the costs of a grout program and to a low activity waste vitrification facility seem comparable. A recent (2003) report from Office of River Protection—USDOE to USDOE-HQ compared the cost of various options including an all vitrification option and an all grout option. This 2003 report shows that an all vitrification option is the most cost effective approach and that an all grout option would be one of the most costly approaches because of project impact costs associated with changing project direction and mitigating nitrate and Technetium impacts (Assessment of Low Activity Waste Treatment And Disposal Scenarios for the River Protection Project, Holton, L.K., et. al., April 14, 2003).

Based on technical issues, cost, schedule, land use, and public concern, USDOE and the State of Washington agreed to a new baseline that replaced grout with vitrification for the low activity portion of Hanford tank waste. In return, USDOE was given a longer time (which was further extended in order to accommodate subsequent privatization initiatives) to begin treating Hanford’s tank waste.

More recently (2001-2003), Washington State has agreed to consider other waste forms to supplement the production of the Waste Treatment Plant (which includes the Low Activity Vitrification facility) in order to help move the end of treatment date closer to 2028 compared to 2050s. This agreement has been based on the condition that any new waste form will need to perform as well as vitrified glass. That is, the waste form, which will remain near the land surface and the Columbia River in perpetuity, must contain the waste for as long as it is hazardous to human health and the environment, must be in some manner retrievable or correctable in the event of failure, and must not greatly multiply the volume of waste, and thus the land area required for disposal. Currently USDOE is evaluating three technologies that may augment the Waste Treatment Plant including Steam Reforming, Containerized Grout, and Bulk Vitrification. The State of Washington is engaged in the evaluation, and will carefully assess the results in terms of the previously stated criteria.

Mr. GREENWOOD. Okay. My time has expired. The gentlelady from Colorado.

Ms. DEGETTE. Thank you, Mr. Chairman.

Mr. Michael Wilson, as I understood your testimony and also I think this was true of South Carolina, both of your States entered as an amicus curiae for the plaintiff—really a friend of the court brief that you filed. But what I heard you saying was the reason you entered in this suit—and this is to clarify a question that the chairman asked, too. It is not that you think that all of this waste should be characterized the same and sent to Yucca Mountain or similar facility, correct?

Mr. MICHAEL WILSON. That’s correct.

Ms. DEGETTE. What you were really concerned about, as you said, was that you wanted to make sure that the DOE did not—you said two things you wanted to make sure that the DOE didn’t mischaracterize the high-level waste and leave it lying around in tanks.

Mr. MICHAEL WILSON. That they don’t go through some simplified internal process that doesn’t include a treatment of the

waste and declare it no longer high-level waste, so it could stay potentially in the tanks at Hanford.

Ms. DEGETTE. And Mr. David Wilson, was that a similar concern that South Carolina had?

Mr. DAVID WILSON. I think that characterizes it very well.

Ms. DEGETTE. Mr. Chairman, I was given a little sheet by the Natural Resources Defense Council. What they said is that they were hoping to have some testimony and sort of a statement by them. I ask unanimous consent to put that and also the court decision—

Mr. GREENWOOD. Only reserve the right to reject just to give counsel an opportunity to look at that document.

Ms. DEGETTE. It is a one-page statement of what their rationale for the lawsuit was. And I think the record would be complete if we put it in there. So we will give you a copy of it. This is the only copy I have. What they are saying in here is that what they were concerned about in the lawsuit is that they didn't want the DOE to reclassify high-level radioactive waste as incidental waste, which is the same concern you guys are expressing. You are both nodding. Would that be your understanding as well?

Mr. MICHAEL WILSON. Yes.

Mr. DAVID WILSON. Yes.

Ms. DEGETTE. And so, I guess what I'm—I think we are kind of agreeing here which is that we don't want the DOE mischaracterizing high-level waste as low-level, so they don't have to treat it appropriately. But at the same time, we don't think that the law should mandate that once some of the waste is high-level everything has to be characterized that way and sent off to the facility. Would that be your understanding?

Mr. DAVID WILSON. Yes. Even though we agree as to how the waste is characterized, there is still the issue of how much remains onsite, because you can have quite a significant amount of quantities of radioactivity that is going to have to be managed for a very long time onsite. And, of course, that's a very big concern for us.

Ms. DEGETTE. So you want to make sure that whatever statute that Congress enacts does not give the DOE the authority, the other direction to just leave high-level waste onsite. You want it correctly disposed of.

Mr. DAVID WILSON. That's correct.

Mr. MICHAEL WILSON. You use the word characterize, and I think one of our concerns is not just characterizing, but it's the treatment of the high-level waste. So once it is treated to remove the significant radionuclides, that that which is remaining could then be characterized as low-activity or some other kind of waste.

Ms. DEGETTE. Now, this court decision, as I understand it, came out on July 2 of this month. Is that correct?

Mr. MICHAEL WILSON. I have heard that.

Ms. DEGETTE. And you say the parties are planning to meet to talk about what the court decision meant and what next steps people might be taking. Is that right?

Mr. MICHAEL WILSON. As far as I know, there's a conference call.

Ms. DEGETTE. Is your Attorney General also working on this in South Carolina?

Mr. DAVID WILSON. We're doing it through our Department, but yes, they'll be involved.

Ms. DEGETTE. Do you know when that meeting might be taking place?

Mr. MICHAEL WILSON. Next week.

Ms. DEGETTE. I want to shift gears for 1 second and ask Mr. Wilson of Washington, you heard the GAO, voice concern over the fact that DOE does not plan to construct an integrated-pilot-scale testing facility prior to a full-scale facility. I am wondering if Washington has a position on that.

Mr. MICHAEL WILSON. And I'm back to this balanced position that we find ourselves in as regulators. Because, again, for 10 years there has been delay, delay, delay and again, we don't want to be in the position of forcing them to do something stupid. So to a certain extent and then again, we're not the experts in this field, but we are told pretty much what Ms. Roberson talked about this morning that—I mean these technologies have never been combined perhaps in this type of facility, that individually many of the technologies have been developed up to and including commercial scale. So as we understand it, they think that they can do the job and we're on board with that.

Ms. DEGETTE. I mean, do you have any concern that some of the problems that they had at Savannah River with the Intake Precipitator Project might be repeated?

Mr. MICHAEL WILSON. I'm just not that familiar with the specific individual technologies. I'll go back to what Mr. Walden said earlier. He was referring to the nerve gas plant in his district across the river in Boardman. And those were technologies that were well-developed and what he didn't say was that when they started working there, they had problems also. I think in any large chemical processing plant of this nature, and nuclear facility of this nature, that come 2000 and whenever, when they throw the switch, it's not going to work perfectly the first time, and that's why they have a ramp-up period of that time, and they'll work through the problem.

Ms. DEGETTE. That's why I think the GAO is concerned that maybe they should do a pilot-scale testing facility instead of just some lab tests. Because, of course, if they throw the switch and there's big problems like at Savannah River, it could delay the whole project for an indeterminate amount of time. Does that give you concern?

Mr. MICHAEL WILSON. At Hanford almost all the waste treatment facilities that have been constructed out there have been first or one-of-a-kind or at least limited-production kinds of facilities, and there have been problems, and they work through them. This is bigger and the most complex plan to date, and, again, we are relying to a large extent on the expertise in place.

Ms. DEGETTE. Mr. Chairman, I would just conclude by, again, renewing—I guess counsel has now reviewed the NRDC testimony. Renewing my request for insertion of that testimony and the court decision in the record.

Mr. GREENWOOD. The Chair thanks the gentlelady and the Chair withdraws his reservation and without objection the statement of

the Natural Resources Defense Council dated July 17, 2003 will be a part of the record.

I would like to clarify. I think the gentlelady may have misspoke or was misadvised, the NRDC did not request to testify at this hearing.

Ms. DEGETTE. I apologize. I didn't mean to insinuate.

Mr. GREENWOOD. We would have been delighted to have them testify, and if there are legislative hearings on a rewrite of the law, we would certainly invite their testimony and expertise.

Ms. DEGETTE. I think it would be very useful not just to have the NRDC and other parties, but also to have some of the attorneys involved both for the Department and for the parties after they have their meeting next week, because I think we need to work very, very carefully as we draft additional legislation to make sure that we address the concerns expressed by the States here, but also that we bring some rationality to the law.

Mr. GREENWOOD. And, of course, I am sure there will be legislative hearings, and Mr. Barton will be making those decisions.

The Chair thanks the witnesses for testifying and the hearing is adjourned.

[Whereupon, at 11:15 a.m., the subcommittee was adjourned.]

[Additional material submitted for the record follows:]



NATURAL RESOURCES DEFENSE COUNCIL

## STATEMENT OF THE NATURAL RESOURCES DEFENSE COUNCIL

HOUSE ENERGY AND COMMERCE COMMITTEE  
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONSHEARING ON ENERGY DEPARTMENT'S  
HIGH-LEVEL RADIOACTIVE WASTE PROGRAM

July 17, 2003

On July 2, 2003, the Chief Judge of the Federal District Court in Idaho, interpreting the plain language provided by Congress, ruled that the Department of Energy (DOE) violated the law when it granted itself the authority to reclassify high-level nuclear waste. DOE had granted itself the reclassification authority so that it could abandon the high-level radioactive waste at three nuclear weapons facilities. In his ruling, Judge B. Lynn Winmill wrote, "... DOE does not have discretion to dispose of defense [high-level waste] somewhere other than a repository established under [the Nuclear Waste Policy Act]."

The Court directly enforced the will of Congress as expressed in the Nuclear Waste Policy Act (NWPA), directing that DOE dispose of millions gallons of the most highly radioactive waste in the world in a deep geologic repository, rather than allowing DOE to abandon that waste in corroding, leaking tanks.

**Background**

As this Committee is well aware, over the past 50 years U.S. nuclear weapons facilities have generated some 100 million gallons of high-level radioactive waste. In 1982, Congress passed the Nuclear Waste Policy Act, which requires the Department of Energy to dispose of this waste in a deep, geologic repository. This waste sits in more than 200 massive underground storage tanks at three DOE sites: the Hanford Reservation in Washington near the Columbia River, the Idaho National Engineering and Environmental Laboratory (INEEL) above the Snake River Aquifer, and the Savannah River Site in South Carolina. Managing these tanks is DOE's most expensive and technically complex problem. The agency has considered numerous plans and implemented some with limited success, but more often substantial failure. Hundreds of thousands of gallons of high-level radioactive waste have leaked from these storage tanks into the environment. Looking for a way to avoid dealing with a costly and difficult problem, DOE created for themselves a loophole in their waste management rules to violate the Nuclear Waste Policy Act, allowing it to abandon high-level radioactive at the three sites, which would seriously threaten public health and the environment.

**The Loophole in Order 435.1**

In 1999 DOE adopted Order 435.1, the agency's internal regulatory tool for managing its radioactive waste. The order includes a provision allowing DOE to reclassify high-level radioactive waste as "incidental" waste. The agency planned to use this loophole, the incidental waste exemption, to enable it to permanently abandon thousands of gallons of high-level

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radioactive waste at Hanford, Savannah River and INEEL. The incidental waste exemption has now been invalidated by the Idaho Federal District Court.

The way the incidental waste exemption worked was simple. DOE gave itself the authority to reclassify high-level radioactive waste that remains in storage tanks after some of the liquid waste has been pumped out. By renaming the remaining waste “incidental” waste, the agency ostensibly did not have to dispose of it in a geologic repository as required by the Nuclear Waste Policy Act. Instead, the agency could treat the waste as if it were low-level radioactive waste, abandon it in the storage tanks and fill the tanks with grout (like mortar). Along with violating the law, a major flaw in the plan is this abandoned “incidental” waste is at least as radioactive – **and often more radioactive** – than the high-level radioactive waste the agency removes from the tanks for disposal in a geologic repository.

DOE’s plan created three national sacrifice zones for high-level radioactive waste. Abandoning tens of thousands of gallons of high-level radioactive waste in the Washington, South Carolina and Idaho tanks would have resulted in a potentially catastrophic dispersal of radioactivity into the environment and, at a minimum, require significant land-use restrictions, maintenance, and monitoring for thousands of years.

#### **The Litigation**

In February 2002, NRDC (the Natural Resources Defense Council), the Idaho-based Snake River Alliance, and the Yakama and Shoshone-Bannock nations, sued DOE for violating the Nuclear Waste Policy Act by issuing Order 435.1 and its incidental waste exemption. The Idaho Federal District Court decided this matter in NRDC’s favor on July 2, 2003, holding that “... NWPA does not delegate to DOE the authority to establish ‘alternative requirements’ for solid waste. Because Congress has spoken clearly on that subject, that is the end of the matter.”

Simply put, the Idaho Federal Court enforced the clear will of Congress as expressed in the NWPA. DOE must now comply with the law and clean up its high-level radioactive waste, not abandon it under a layer of concrete-like material.

We thank the Members of the Subcommittee for allowing NRDC to submit this brief statement. The Federal Court’s Decision in *NRDC, et al. v. Abraham, et al.* is attached.

Geoffrey H. Fettus, Staff Attorney  
Natural Resources Defense Council  
1200 New York Avenue, NW, Suite 400  
Washington, D.C. 20005  
(202) 289-2371  
gfettus@nrdc.org

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF IDAHO

NATIONAL RESOURCES	)	
DEFENSE COUNCIL, et al,	)	Civ. No. 01-0413-S-BLW
	)	
Plaintiffs,	)	
	)	MEMORANDUM DECISION
v.	)	
	)	
	)	
SPENCER ABRAHAM, Secretary,	)	
Dept. Of Energy; UNITED STATES	)	
OF AMERICA	)	
	)	
Defendants.	)	
_____	)	

**INTRODUCTION**

The Court has before it cross-motions for summary judgment raising the issue whether Order 435.1 issued by the Department of Energy is valid. The Court finds that it is invalid, and hence will grant the plaintiffs' motion, and deny the Government's motion, for the reasons expressed below.

**BACKGROUND FACTS**

In the 1950s, the National Academy of Sciences determined that high-level nuclear waste could be disposed of safely in a repository deep underground. During the same time period, Congress, in the Atomic Energy Act (AEA), granted

to the DOE's predecessor agency the authority to manage nuclear waste, and allowed private companies the right to own and operate nuclear reactors.

Over the next 30 years, scientists studied different types of underground sites, ranging from salt deposits to basalt, to dispose of the waste from these reactors. In 1982, Congress passed the Nuclear Waste Policy Act (NWPA), officially adopting the underground repository concept as the nation's long-term strategy for disposing of the most hazardous nuclear waste. The Act authorized the Department of Energy (DOE) to find, build, and operate such a repository. DOE selected nine potential sites, and in 2002, Congress approved the site in Yucca Mountain, Nevada.

While the repository was being studied and selected, nuclear reactors around the country were producing nuclear waste. The fuel that runs nuclear power plants is made up of small uranium and plutonium pellets placed in long metal fuel rods. The rods are bombarded with neutrons, causing the uranium and plutonium atoms to gain a neutron, become unstable, break apart, and release heat, among other things. The heat is used to boil water into steam, which drives turbines to create electricity.

After frequent bombardments, the fission reaction becomes inefficient and the rods are removed. Even so, the uranium and plutonium pellets are not entirely

spent, and contain a large amount of energy potential. To extract the still-usable isotopes, the pellets are dissolved in an acid bath. This reprocessing procedure leaves highly radioactive particles suspended in an acid chemical solution as a liquid waste. The acid is neutralized and the liquid is placed in storage tanks. Over time, the particles sink to the bottom of the tanks forming a sludge while the liquid remains on top.

The reprocessing waste from nuclear weapons production is stored mainly at three sites: (1) the INEEL facility in Idaho; (2) the Hanford site in Washington; and (3) the Savannah River site in South Carolina. Hanford stores over 53 million gallons of waste in 177 underground tanks. Savannah River has over 34 million gallons, and the INEEL has over 900,000 gallons.

In NWPA, Congress defined the term "high-level radioactive waste" (HLW) to mean

- (A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and
- (B) other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation.

NWPA goes on to state that the President shall determine if HLW resulting from defense activities will be placed in its own separate repository or in a repository

also used to store commercially-produced waste. *See* 42 U.S.C. § 10107. If the President determined that no separate repository was needed for the defense waste, “the Secretary shall proceed promptly with arrangement for the use of one or more of the repositories to be developed . . . for the disposal of such waste.” That provision goes on to state that “[s]uch arrangements shall include the allocation of costs of developing, constructing, and operating this repository or repositories.” *See* 42 U.S.C. § 10107(b)(2).

In 1999, DOE issued Order 435.1, and an interpretative Manual, to govern the disposal of HLW at Hanford, INEEL, and Savannah River. One part of that Order defines a process by which HLW may be determined to be incidental waste and exempted from the NWSA requirements governing HLW. Incidental wastes, DOE explains, “do not warrant geologic repository disposal because of their lack of long-term threats to the environment and man.” *See Order 435.1 Guidance* at II-18.

To implement this policy, the Order redefines HLW as incidental waste if it meets the following criteria: (1) key radionuclides must be removed to the extent technically and economically practical; (2) the waste must meet safety requirements comparable to the performance objectives set out in 10 C.F.R. part 61, Subpart C; and (3) the waste must be managed in accordance with DOE’s

requirements for low-level waste as set forth in Chapter IV of the Manual, provided the waste is incorporated into a solid physical form that does not exceed concentration limits for Class C low-level waste set out in 10 C.F.R. § 61.55, or must meet such alternative requirements for waste classification and characterization as DOE may authorize.

NRDC challenged this Order by filing suit in this Court. DOE responded with a motion to dismiss raising standing and ripeness challenges, among others. The Court rejected those challenges, finding that the case was ripe for review and that the plaintiffs had standing.

The parties have now filed cross-motions for summary judgment. NRDC claims that DOE has exceeded its authority by attempting through Order 435.1 to revise the definition Congress set for HLW in NWPA. DOE counters that NWPA does not apply to defense reprocessing waste, the type of waste stored at Hanford, INEEL, and Savannah River. Even if defense wastes are governed by NWPA, DOE contends, Order 435.1 complies with NWPA. NRDC responds that defense wastes are covered by NWPA, and that Order 435.1 conflicts with that Act.

#### ANALYSIS

##### 1. Ripeness

DOE has again raised the argument that this case is not ripe for review.

DOE cites in support the recently decided case of *National Park Hospitality Assn. v. Dept. of Interior*, 123 S.Ct. 2026 (2003). This case did not change the law of ripeness, and its analysis does not persuade the Court to change its opinion. The Court issued a detailed ruling on the ripeness issue in its earlier decision, and reaffirms that decision here.

2. **NWPA's Applicability to Defense Waste**

DOE argues that "Congress did not intend that NWPA would apply to atomic energy defense facilities," and urges the Court to reconsider its earlier rejection of this argument in a decision filed August 3, 2002. See *DOE Brief* at p. 21. In that decision, the Court held that DOE was required by NWPA to dispose of defense HLW in a repository established under NWPA. In seeking a reconsideration of that decision, DOE contends that President Reagan's determination that no separate repository for defense waste was needed did not trigger a DOE duty to dispose of defense waste in a NWPA repository but only "require[d] that [DOE] allocate to the Government the costs associated with any disposal of defense HLW in a commercial repository that in fact occurs." See *DOE Reply Brief* at p. 2. In essence, DOE contends that it can choose whether to

dispose of its defense waste in Yucca Mountain or elsewhere.<sup>1</sup>

This interpretation is inconsistent with NWPA. In § 10107(b)(2), quoted above, NWPA states that the Secretary “shall proceed promptly with arrangement for the use of one or more of the repositories” to dispose of defense HLW. The use of the term “shall” means that the direction is mandatory and does not allow for discretion on the part of the agency. *Lexecon, Inc. v. Milberg Weiss Bershad Hynes & Lerach*, 523 U.S. 26, 31 (1998). Thus, DOE does not have discretion to dispose of defense HLW somewhere other than a repository established under NWPA.

DOE’s argument that its sole duty is to allocate costs ignores language in NWPA. The provision of § 10107(b)(2), quoted above, states that DOE’s duty is to proceed promptly “with arrangement” to dispose of the defense HLW in a repository, and then states that “[s]uch arrangements shall include the allocation of costs of . . . this repository.” DOE’s reading of subsection (b)(2) ignores the word “include” and treats the phrase regarding cost allocation as a limitation on its duty. That reading violates a cardinal rule of statutory interpretation that no word be

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<sup>1</sup> The Nuclear Regulatory Commission (NRC) takes the same view. See 65 Fed.Reg. 62377, 62378 n. 10 (Oct. 18, 2000) (“Neither the NWPA nor 10 CFR Part 60 requires HLW to be disposed of in a geologic repository.”). Moreover, the NRC agrees with DOE that Order 435.1 is a proper exercise of DOE’s statutory authority. See AR 34362.

ignored. *United States v. Luna-Madellaga*, 315 F.3d 1224, 1230 (9th Cir.1993). The word “include” is used to introduce illustrative examples, and is not a term of limitation. See *Federal Land Bank of St. Paul v. Bismarck Co.*, 314 U.S. 95, 100 (1941) (holding that “the term ‘including’ is not one of all-embracing definition, but simply connotes an illustrative application of the general principle.”); *Federal Trade Commission v. MTK Marketing*, 149 F.3d 1036 (9th Cir. 1998) (holding that term “including” does not connote limitation). Thus, subsection (b)(2)’s discussion of cost allocation is simply one illustration of the various arrangements DOE must make to dispose of defense HLW in a NWPA repository.

DOE’s description of its duty is not consistent with the description offered by President Reagan in his determination. There, President Reagan states that the DOE recommended to him that it “proceed with plans and actions to dispose of defense waste in a commercial repository,” not just make a cost allocation. See A.R. 44673. Even eleven years later, in 1996, the DOE believed that President Reagan’s determination triggered its duty, under NWPA, “to proceed with plans and actions to dispose of defense waste with commercial spent nuclear fuel in a single repository.” See *DOE, Civilian Radioactive Waste Management Program Plan, Revision 1, May 1996* (excerpted in *Natural Resources Journal, Appendix A* (Fall 1996)).

Congressional intent also weighs against DOE's interpretation. Senator Alan Simpson, in addressing an amendment that eventually became § 10107, discussed the need for a "unified disposal system as an alternative to separate, duplicative systems of civilian and defense repositories," and then stated that the amendment "would remedy this deficiency by *requiring the President . . . to proceed with a unified system* unless he [sic] determines there is a demonstrated clear need for a defense-only repository." *See* 128 Cong. Rec. Part 6, p. 8219 (Appendix 7) (emphasis added).

For all these reasons, the Court does not find persuasive DOE's arguments that NWPA does not apply to defense HLW. The Court therefore refuses to reconsider its earlier decision on this issue.

**3. Legality of Order 435.1**

When a court reviews an agency's construction of a statute it administers, the threshold issue is "whether Congress has directly spoken to the precise question at issue." *Chevron U.S.A. Inc. v. N.R.D.C.*, 467 U.S. 837, 842 (1984). If Congress has so spoken, and its intent is clear, "that is the end of the matter; for the court, as well as the agency, must give effect to the unambiguously expressed intent of Congress." *Id.* at 843.

In this case, Congress defined HLW in NWPA as "highly radioactive

material resulting from the reprocessing of spent nuclear fuel.” Congress then used the word “including” to signal that what followed were examples designed to illustrate the definition just given. The two examples are (1) “liquid waste produced directly in reprocessing”; and (2) “solid material derived from such liquid waste that contains fission products in sufficient concentrations.”

These two examples neatly cover the manner in which the waste separates in the tanks over time. As discussed above, the solids sink to the bottom, forming a sludge, leaving the liquids on top. This physical separation is analogous to NWPA’s definitional separation: The liquid and solids are treated differently by the Act. While NWPA allows DOE to treat the solids to remove fission products, thereby permitting reclassification of the waste, NWPA does not offer the option of reclassification for liquid waste produced directly in reprocessing.

DOE interprets NWPA much differently. According to DOE, NWPA defines HLW as “‘highly radioactive material resulting from reprocessing’ ‘that contains fission products in sufficient concentrations.’” *See DOE Brief* at p. 31. Once again, DOE is ignoring the word “includes” in the statute. As discussed above, the well-established rules of statutory construction prohibit such a reading. *See Federal Land Bank*, 314 U.S. at 100. When the word “includes” is not ignored, the following phrase referring to concentrations of fission products

applies only to solid material derived from the liquid waste, and is not part of the general definition of HLW.

NWPA's definition of HLW considers both the source of the waste and, in the case of solids derived from liquid waste, its hazard. It is undisputed that the waste stored at Hanford, INEEL, and Savannah River is highly radioactive and the result of reprocessing. No solids have yet been extracted from the liquid waste at those sites and treated to reduce fission products. Thus, the waste at issue in this case falls within NWPA's definition of HLW.

DOE issued Order 435.1 to govern reclassification of that waste. That Order, according to DOE, sets forth three criteria, "each of which must be met," to reclassify HLW as low-level waste. *See DOE Brief* at 37. This rigorous process, DOE implies, will protect against arbitrary action. However, one of those "three criteria" is not a benchmark that could be "met." It requires that HLW reclassified as low-level waste must meet "safety requirements comparable to the performance objectives set out in 10 C.F.R. 61, Subpart C . . . ." In other words, DOE will treat waste that it deems to be low-level waste as low-level waste. This is not a "third criteria" that must be "met" but is simply a statement of intent or fact.

There are really only two criteria that must be met. The first is that key radionuclides are removed to the extent technically and economically practical.

This means that if DOE determines that it is too expensive or too difficult to treat HLW, DOE is free to reclassify it as incidental waste.

The second is that HLW incorporated into a solid form must either meet the concentration levels for Class C low-level waste or meet such alternative requirements for waste classification and characterization as DOE may authorize. These "alternative requirements" are not defined, and thus are subject to the whim of DOE.

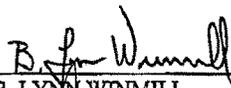
While DOE has the authority to "fill any gap left . . . by Congress," *Chevron*, 467 U.S. at 843, it does not have the authority "to adopt a policy that directly conflicts with its governing statute." *Maislin Indus., Inc. v. Primary Steel, Inc.*, 497 U.S. 116, 134-35 (1990). DOE's Order 435.1 directly conflicts with NWPA's definition of HLW. NWPA's definition pays no heed to technical or economic constraints in waste treatment. Moreover, NWPA does not delegate to DOE the authority to establish "alternative requirements" for solid waste. Because Congress has spoken clearly on that subject, "that is the end of the matter," *Chevron*, 467 U.S. at 842, leaving no room for "alternative requirements."

Thus, DOE's Order 435.1 must be declared invalid under *Chevron*. The Court will therefore grant NRDC's motion for summary judgment and deny DOE's cross-motion. The Court did not rely on an extra-record material and so

will deem moot the motion to strike that material. The Court will also grant DOE's motion to supplement the administrative record to correct photocopying errors and replace items inadvertently omitted from the administrative record.

NRDC seeks injunctive relief prohibiting DOE from taking any actions inconsistent with NWPA, including plans for grouting with concrete for permanent disposal any HLW in Washington, Idaho, and South Carolina. There is no indication, however, that DOE will ignore this decision and continue with any plan inconsistent with NWPA. Thus, the Court finds no need at this time to issue injunctive relief. Should that need arise in the future, plaintiffs are free to re-open this case and pursue that relief. The Court will prepare a separate Judgment as required by Federal Rule of Civil Procedure 58.

Dated this 2nd day of July, 2003.

  
\_\_\_\_\_  
B. LYNN WINMILL  
CHIEF JUDGE, UNITED STATES DISTRICT COURT

IN THE UNITED STATES DISTRICT COURT  
FOR THE DISTRICT OF IDAHO

NATIONAL RESOURCES	)	
DEFENSE COUNCIL, et al,	)	Civ. No. 01-0413-S-BLW
	)	
Plaintiffs,	)	
	)	JUDGMENT
v.	)	
	)	
SPENCER ABRAHAM, Secretary,	)	
Dept. Of Energy; UNITED STATES	)	
OF AMERICA	)	
	)	
Defendants.	)	

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In accordance with the Memorandum Decision filed with this Judgment,  
 NOW THEREFORE IT IS HEREBY ORDERED, ADJUDGED, AND  
 DECREED, that the plaintiffs' motion for summary judgment (docket no. 56) is  
 hereby GRANTED, and defendants' motion for summary judgment (docket no.  
 66) is hereby DENIED.

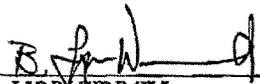
IT IS FURTHER ORDERED, ADJUDGED, AND DECREED, that the  
 DOE has violated NWPA by promulgating Order 435.1 as it relates to incidental  
 waste, and that portion of Order 435.1 is declared invalid under the Administrative

Procedures Act, 5 U.S.C. § 701 *et seq.*

IT IS FURTHER ORDERED, ADJUDGED, AND DECREED, that the motion to strike (docket no. 68) is DEEMED MOOT, and the motion to supplement administrative record (docket no. 73) is hereby GRANTED.

IT IS FURTHER ORDERED, ADJUDGED, AND DECREED, that this action is hereby DISMISSED IN ITS ENTIRETY.

Dated this 2nd day of July, 2003.

  
\_\_\_\_\_  
B. LYNN WINMILL  
CHIEF JUDGE, UNITED STATES DISTRICT COURT



**The Secretary of Energy**  
Washington, DC 20585

August 1, 2003

The Honorable J. Dennis Hastert  
Speaker of the U. S. House of Representatives  
Washington, D.C. 20515

Dear Mr. Speaker:

The purpose of this letter is to submit to Congress legislation to allow the Department of Energy (DOE), in consultation with the Nuclear Regulatory Commission (NRC), to address management and disposal of high-level radioactive wastes safely and cost effectively.

Currently, the Department of Energy manages certain waste that is the result of reprocessing spent nuclear fuel for defense purposes in storage tanks at three sites: the Savannah River Site in South Carolina, the Idaho National Engineering and Environmental Laboratory, and the Hanford Site in Washington State. Consistent with the longstanding views of the Department of Energy, the Nuclear Regulatory Commission, and their predecessor agency the Atomic Energy Commission, the Department has long planned to dispose of this material by separating the high activity fraction of this material from the low activity fraction, solidifying the high activity fraction and disposing of it in a deep geologic repository, disposing of the low activity fraction in low-level or transuranic waste facilities, removing key radionuclides from any residues to the maximum extent technologically and economically feasible, and grouting and disposing of the tanks and any remaining residues on site provided that DOE, in consultation with the NRC, concludes that this can be done in a manner that meets the NRC's health and safety standards for the disposal of low-level waste.

This strategy fundamentally assumes that DOE, in consultation with the NRC, has the authority to manage and dispose of different tank wastes according to the risks they present. A significant portion of the cost savings to be realized from accelerating the high-level waste program is likewise predicated on this assumption that DOE has the authority to manage and dispose of tank wastes in this manner.

A recent District Court decision has cast serious doubt on this entire strategy. The decision significantly limits DOE's ability to separate wastes removed from storage tanks into high and low activity fractions and to dispose of the low activity fractions in low-level waste or transuranic waste storage and disposal facilities -- even though disposing of this material in this fashion would be entirely consistent with the health and safety standards governing the disposal of low-level or transuranic waste. Instead it would require DOE to dispose of this material in a geologic repository to be developed under the Nuclear Waste Policy Act of 1982 for spent nuclear fuel and high-level radioactive waste even though the material does not require that degree of isolation. The decision also imposes significant



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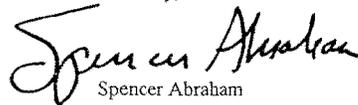
constraints on DOE's ability to close and grout the tanks -- again, even though the end result would be consistent with NRC health and safety standards for disposal of low-level waste -- and may even require disposing of the tanks themselves in the repository for spent fuel.

Because the precise principle underlying the district court's decision is somewhat unclear, we are hesitant to state a definite view about its exact effects. The result certainly may be decades of delay in removing the waste from the tanks, the need to dispose of far more material than any prior estimates have assumed in a deep geologic repository, far exceeding the statutory or physical capacity of the Yucca Mountain site, and a program to prepare spent nuclear fuel reprocessing wastes for disposal that will be orders of magnitude more expensive than the \$39 billion life cycle costs currently projected. Should this scenario come to pass, it would be most unfortunate, since the additional delay and expense in removing and disposing of this material would not be the result of health and safety considerations and would likely in fact create serious health and safety risks of their own. In any event, whatever the future may hold, one thing we can state with confidence is that the uncertainty this decision has created is of substantial concern to the Department and has made it very difficult for the Department to make firm plans about the disposal of this material at this time.

Accordingly, the Department of Energy respectfully submits the attached legislative proposal, which would clarify that the Secretary of Energy, in consultation with the NRC, retains his longstanding authority to separate and dispose of this material according to the risk it presents. Current law implies but does not state explicitly that the Secretary in consultation with the NRC is authorized to determine on that basis which reprocessing wastes are sufficiently radioactive to require disposal in a deep geologic repository as "high-level radioactive waste," and which are not. This legislation would make that implication express and thereby resolve the confusion and uncertainty created by the recent district decision in a manner that would allow the Department to move forward with its plans for accelerating the cleanup and disposal of this material.

The Office of Management and Budget advises that there is no objection to the transmission of this legislative proposal to the Congress from the standpoint of the President's program. If you or your staff have any questions regarding the proposal, please call Shannon Henderson, Acting Assistant Secretary for Congressional and Intergovernmental Affairs, at 202-586-5450.

Sincerely,



Spencer Abraham

Enclosure

## High-Level Radioactive Waste

Sec. \_\_\_\_\_

(a) Section 2(12) of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101(12)) is amended by adding at the end thereof the following:

"High-level radioactive waste does not include radioactive materials resulting from the reprocessing of irradiated reactor fuel (including wastes commingled or contaminated with such materials) that the Secretary of Energy, in consultation with the Nuclear Regulatory Commission, determines do not require permanent isolation by disposal in a deep geologic repository designed for disposal of spent nuclear fuel and high-level radioactive waste in order to protect the public health and safety."

(b) Section 6(4) of the West Valley Demonstration Project Act (42 U.S.C. 2021a note) is amended by adding at the end thereof the following:

"High-level radioactive waste does not include radioactive materials resulting from the reprocessing of irradiated reactor fuel (including wastes commingled or contaminated with such materials) that the Secretary of Energy, in consultation with the Nuclear Regulatory Commission, determines do not require permanent isolation by disposal in a deep geologic repository designed for disposal of spent nuclear fuel and high-level radioactive waste in order to protect the public health and safety."

(c) Section 11dd. of the Atomic Energy Act of 1954 (42 U.S.C. 2014(dd)) is amended by inserting ", as amended" after "1982".

(d) For purposes of section 202 of the Energy Reorganization Act of 1974 (42 U.S.C. 5842), the term "high-level radioactive waste" means--

(1) spent nuclear fuel as that term is defined in section 2(23) of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101(23)), and

(2) high-level radioactive waste as that term is defined in section 2(12) of the Nuclear Waste Policy Act of 1982 (42 U.S.C. 10101(12)).

## Explanation for High Level Waste Definition Amendment

The amendment clarifies the definition of "high-level radioactive waste" contained in section 2(12) of the Nuclear Waste Policy Act of 1982, 42 U.S.C. 10101(12), by stating explicitly that material resulting from reprocessing (as well as any material commingled or contaminated with it) is not high-level waste if the Secretary of Energy, in consultation with the Nuclear Regulatory Commission (NRC), determines the material need not be permanently isolated by disposal in a deep geologic repository designed for the disposal of spent nuclear fuel in order to protect the public health and safety. The original 1982 definition implied but did not state that the Secretary in consultation with the NRC was authorized to determine on that basis which reprocessing wastes are sufficiently radioactive to require disposal in the repository as "high-level radioactive waste." Recently, however, it has been asserted that the definition actually somehow forecloses the Secretary from making these judgments, a result not intended when the Nuclear Waste Policy Act was adopted. This assertion is contrary to the long standing practice of the DOE and the NRC, a practice begun by the Atomic Energy Commission. Accordingly the amendment adds a clause to the definition spelling out the Secretary's authority to make these determinations in consultation with the NRC and the standard he is to apply in making them.

In its current form, the NWPA's definition of high level waste states that "The term high-level radioactive waste means (A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and (B) other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation." The definition is currently silent on the process and standard for determining what waste from reprocessing qualifies as high-level waste under clause A.

The nuclear wastes involved are those generated in conducting the Nation's defense activities, which required "reprocessing" irradiated nuclear reactor fuel in order to extract from it nuclear materials necessary for defense programs. The reprocessing techniques involve chemical immersion of irradiated fuel elements, this yields liquid wastes containing a variety of suspended and diffused compounds. The wastes are neither chemically nor radiologically homogeneous, and therefore constitute combinations of distinct waste streams.

Although the text of the current definition is silent on the question, the implication from the current definition is that determining which of these waste streams are "highly radioactive material" should be done in a manner that accords with the rest of the definition and its original purpose, which is to allow the Secretary of Energy to emplace in a geologic repository those materials from reprocessing that require the degree of isolation that this method of disposal would provide. That is also the most plausible view in light of the Atomic Energy Act's grant of authority to the Atomic Energy Commission (transferred to the Secretary by the Energy Reorganization Act of 1974 and the Department of Energy Organization Act) to provide for the safe storage, processing, and disposal of nuclear defense waste, 42 U.S.C. 2121(a)(3), an authority that the NWPA left largely undisturbed. See 42 U.S.C. 10107. Accordingly, both DOE and the NRC have taken the view that DOE, in consultation with the NRC, may properly evaluate reprocessing waste and components against the risk-based performance objective of protecting the public health and safety and thereby determine which components properly are

considered "high-level radioactive waste" that should go to a deep geologic repository, and which components can safely be disposed of through other means. As noted above this has been a long-standing practice.

In particular, the Department, in consultation with the NRC, has directed its efforts to separating the elements of the wastes, where technologically and economically feasible, in order to segregate those requiring the most extensive steps for isolation, because of their risks, from those that do not. These efforts in turn yield various waste streams, as well as contaminated containers and equipment. The proper disposition of the resulting wastes and materials raises complex issues that necessarily involve specialized technical expertise and evolving technology. Rather than applying a mechanistic formula, in making this determination the Secretary and the NRC evaluate waste streams on a case-by-case basis, taking into account a variety of relevant factors such as the types and amounts of fission products in the material under consideration, the effects of radioactive decay, the results of additional processing and treatment, and the anticipated management and disposal pathway to ensure the protection of the public health and safety. This approach is similar to that employed by the Secretary and the NRC in determining which components of the civilian reprocessing wastes at the West Valley, New York facility should be disposed of as "high-level radioactive waste."

The amendment would codify the current administrative practice by adding a provision at the end of the NWPA definition of high-level radioactive waste which, as noted above would state explicitly that material from reprocessing is not high-level waste if the Secretary, in consultation with the NRC, determines that the public health and safety do not require its disposal in a deep geologic repository for spent fuel and high-level radioactive waste. This language is very similar to the approach taken in the WIPP Land Withdrawal Act, Pub. L. 102-579 (106 Stat. 4777), with respect to what waste constitutes transuranic waste that may be disposed of at WIPP. The EPA Administrator is the certifying authority for WIPP, as the NRC is the licensing authority for Yucca Mountain. After defining transuranic waste as "waste containing more than 100 nanocuries of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years," sec. 2 (18), the WIPP Land Withdrawal Act excepts from that definition waste that the Secretary has determined, with the concurrence of the Administrator, does not need the degree of isolation that EPA's rules for disposal of transuranic waste require WIPP to provide, Sec. 2 (18)(B), or waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61.

For consistency with other statutes that define "high-level radioactive waste," where the same issue arises, this amendment makes clear that the Atomic Energy Act of 1954's cross reference to the NWPA definition refers to the amended version and makes a similar amendment to the West Valley Demonstration Project Act. The amendment also adds a similar incorporation by reference to the licensing provisions of the Energy Reorganization Act of 1974, which employ the term "high-level radioactive waste" without defining it. In the context of those provisions of the Energy Reorganization Act the term also includes spent fuel, and the

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In addition, DOE and NRC have identified certain types of material, such as job wastes (clothing, tools, equipment and the like), contaminated in the course of reprocessing operations, that do not constitute HLW. Although it has not been asserted that the current definition casts doubt on this view, it seems worth clarifying the point explicitly in the course of making other clarifying amendments to the definition.

amendment so specifies.

This amendment does not affect the authority under which EPA has promulgated its radioactive waste disposal regulations at 40 C.F.R. Part 191. In addition, the Environmental Protection Agency will retain all its current authority with respect to that material from reprocessing that the Secretary of Energy determines can be safely disposed of in the Waste Isolation Pilot Plant. There will be no change with respect to EPA's current role with respect to WIPP or the applicability of the Part 191 standards to other facilities, and DOE will continue its current consultation practices with EPA regarding material emplaced in WIPP."