Order Code RS21988
Updated June 2, 2005

Radioactive Tank Wastes: Disposal Authority in the Ronald W. Reagan National Defense Authorization Act for FY2005

David Bearden and Anthony Andrews
Resources, Science, and Industry Division

Aaron M. Flynn
American Law Division

Summary

How to safely dispose of waste from the production of nuclear weapons has been a longstanding issue. The most radioactive of these wastes are stored in underground tanks at Department of Energy (DOE) sites in Idaho, South Carolina, and Washington state. There have been concerns about soil and groundwater contamination, as some of the tanks are known or suspected to be leaking. DOE proposed to pump out the liquid waste, classify the sludge-like remainder as "waste incidental to reprocessing," and seal it in the tanks with a cement grout. DOE argues that closing the tanks in this manner would be a cost-effective and timely way to address environmental risks. Questions have been raised as to how much waste would be left in the tanks, and whether the grout would contain the wastes and prevent leaks. After considerable debate, Congress included provisions in Section 3116 of the Ronald W. Reagan National Defense Authorization Act for FY2005 (P.L. 108-375) that authorize DOE to grout some of the tank wastes in place in Idaho and South Carolina, subject to certain criteria, state approval, monitoring by the Nuclear Regulatory Commission, and appropriations by Congress. The law does not provide such authority in Washington state. This report provides background information, analyzes the waste disposal authority in Section 3116, and examines potential implications for environmental cleanup. It will be updated as developments warrant.

Background

DOE is responsible for managing defense nuclear waste and cleaning up contamination at 114 sites involved in the past production of nuclear weapons. Among these challenges are the management and disposal of radioactive waste stored in underground tanks at sites in three states: Hanford in Washington, Savannah River in South Carolina, and the Idaho National Engineering and Environmental Laboratory (INEEL). There are 177 tanks containing 53 million gallons of radioactive waste at Hanford, 49 tanks containing 37 million gallons at Savannah River, and 11 tanks containing nearly 1 million gallons at the INEEL. Some tanks are deteriorating, and are

known or suspected to have leaked, contaminating soil and groundwater. Of greatest concern are the tanks at Hanford, 67 of which are known or suspected to have leaked radioactive waste that has migrated through groundwater into the Columbia River. At this time, monitoring data indicate that the level of radionuclides in the Columbia River meets federal and state water quality standards. There are similar concerns about possible contamination of the Snake River in Idaho and the Savannah River in South Carolina.

How to decommission (i.e., close) the tanks in a cost-effective and timely manner that mitigates environmental risk and potential exposure of workers has been the subject of controversy. DOE argues that removing all of the tank wastes would take too long to respond to environmental risks from leaking tanks. DOE favors pumping out the liquid waste and immobilizing (i.e., binding up) the sludge-like residual waste by filling the tanks with a cement grout to prevent leaks, arguing that this would be the best method to reduce immediate risks. The waste removed from the tanks that is classified as "high-level" would be stored for future disposal in a centralized geologic repository (such as Yucca Mountain in Nevada), discussed below. Questions have been raised as to how much waste would be left in the tanks, and whether the grout would thoroughly mix with the remaining waste to solidify it and contain it safely to prevent leaks.

Although removing all of the wastes from the tanks would eliminate the risk of contamination, this alternative poses other risks and challenges. DOE argues that methods to extract the residual waste after the liquid waste is pumped out would generate a new hazardous waste stream that would need to be managed and disposed of safely to protect the environment. DOE also asserts that there would be significant risks of exposure to workers who would remove the residues, and manage and dispose of the resulting new waste stream. Once a tank is cleaned, there also would be additional risks to workers who would extract the tank from the ground, and there would be environmental risks from the management and disposal of the contaminated tank metal.

Applicability of the Nuclear Waste Policy Act

How to dispose of the tank wastes is further complicated by the legal issue of how much of the waste is "high-level." Under the Nuclear Waste Policy Act of 1982 (NWPA), high-level radioactive waste must be disposed of in a centralized geologic repository.[1] Consequently, the tank wastes classified as high-level must be removed from the tanks, processed, and stored for disposal in such a repository. In July 1999, DOE issued internal agency Order 435.1 to classify residual tank wastes as "waste incidental to reprocessing," rather than as high-level.[2] In effect, this order would exempt the residual tank wastes from NWPA requirements for disposal in a geologic repository. DOE proposed to dispose of the residual tank wastes at Hanford, Savannah River, and the INEEL by grouting them in place, as discussed above. Sealing off a tank using this method would depend on state concurrence, as DOE must obtain a permit from the state where the tank is located before it can be closed with no further action to be taken.

---

[1] 42 U.S.C. 10101 et seq.

[2] Department of Energy, DOE Order 435.1: Radioactive Waste Management. For further discussion, see CRS Report RL32163, *Radioactive Waste Streams: An Overview of Waste Classification for Disposal*, by Anthony Andrews.

DOE grouted residual wastes in two tanks at the Savannah River site in 2000 with state concurrence. Subsequently, DOE issued a Record of Decision to apply Order 435.1 to the closure of the remaining 49 tanks at the site, and to grout the residual tank wastes that it classified as incidental to reprocessing.[3] The Natural Resources Defense Council (NRDC) legally challenged DOE's authority to dispose of the wastes in this manner. The state of South Carolina and others filed as "friends of the court," due to concern that states would not have a role under Order 435.1 in determining how much of the residual waste would be left in the tanks. In 2003, a federal district court determined that DOE does not have the legal authority to classify any of the tank wastes as other than high-level, nor to dispose of them permanently on site through grouting or other means.[4]

DOE appealed the 2003 ruling, and on November 5, 2004, the U.S. Court of Appeals for the Ninth Circuit reversed the above district court opinion, ruling that the challenge to Order 435.1 was not "ripe" for review.[5] Ripeness is a prudential judicial doctrine based on the case or controversy requirement of Article III of the U.S. Constitution; in short, for a case to be ripe, there must be a present injury or significant threat of imminent injury.[6] The court found that the district court decision predated DOE application of Order 435.1 to a particular situation, and, thus, there was no present conflict with the NWPA.[7] The court determined that while it was possible that DOE might violate the NWPA at some point, it might just as likely comply with all applicable law.[8] Thus, under the terms of the circuit court opinion, DOE may engage in activities pursuant to Order 435.1, and NRDC or others then would be free to bring suit if they believe those activities violate the law.

Congressional Action

Prior to the appeals court decision, the Secretary of Energy asked Congress to enact legislation to clarify DOE's authority for Order 435.1 and allow it to proceed with its plans to grout residual tank wastes at Hanford, Savannah River, and the INEEL. As part of its FY2005 budget request, DOE proposed that $350 million of the Defense Site Acceleration Completion Account be set aside for a "High-Level Waste Proposal" for projects to prepare for the grouting of the tanks. As passed by the Senate, Section 3116 of the Ronald W. Reagan National Defense Authorization Act for FY2005 (H.R. 4200) would have provided authority for DOE to classify the residual tank wastes as incidental to reprocessing and grout them in place in South Carolina, subject to state approval. The House bill did not provide such authority. In conference (H.Rept. 108-767), Section 3116 of the Senate bill was modified and expanded to include Idaho, but not Washington state, where the majority of the leaking tanks are located. The President signed the final bill into law (P.L. 108-375) on October 28, 2004.

---

[3] 67 *Federal Register* 160, August 19, 2002.

[4] Natural Resources Defense Council v. Abraham, 271 F. Supp.2d 1260, 1266 (D. Idaho 2003).

[5] Natural Resources Defense Council v. Abraham, No. 03-35711, 2004 WL 2480949 (Nov. 5, 2004).

[6] See, e.g., Nat'l Park Hospitality Ass'n v. Dep't of the Interior, 538 U.S. 803, 807-08 (2003).

[7] Natural Resources Defense Council, slip op. at 3.

[8] Id. at 4.

Section 3116(a) of P.L. 108-375 authorizes the Secretary of Energy, in consultation with the Nuclear Regulatory Commission (NRC), to classify tank wastes in South Carolina and Idaho as other than high-level, upon making certain determinations. These determinations are (1) that the waste "does not require permanent isolation in a deep geological repository," as is required for high-level waste, and (2) that highly radioactive radionuclides have been removed from the waste to the "maximum extent practical." Assuming the waste meets these two requirements, the Secretary must then determine if the radioactivity of the waste will exceed concentration limits for Class C low-level waste.[9] Whether or not the concentration exceeds allowable levels, the waste could be disposed of according to the performance objectives for the disposal of Class C low-level waste.[10] Such disposal also would be subject to a state-approved closure plan and state-issued permit authorized under other law. However, if concentration levels exceed those for Class C waste, the Secretary must develop a plan for the disposal of such waste in consultation with the NRC, in addition to meeting the aforementioned requirements regarding Class C performance objectives, and state closure plans and permits.

In effect, Section 3116(a) authorizes DOE to grout residual tank wastes if it consults with the NRC and meets the performance objectives for disposal of Class C waste, whether or not the concentration of radionuclides exceeds Class C amounts. These performance objectives require "reasonable assurances" that concentrations of radioactive materials that may be released into the environment do not result in human exposure to specific levels of radiation.[11] The ability of the grout to accomplish this objective would depend primarily on the extent to which it mixes with the residual wastes to prevent leaks from the tank. However, even if a tank leaks, the performance objectives could still be met if the radioactivity decays to allowable levels before contamination migrates and results in human exposure. The objectives also require that protection of individuals from inadvertent intrusion be ensured after active institutional controls are removed. Sealing the tanks with a cement grout arguably would provide a barrier to intrusion, and institutional control of the grouted tanks by DOE presumably would continue as long as the Savannah River site and the INEEL remain operational as federal facilities. Although the grouting of the residual wastes also would be subject to state approval of the tank closure plan and to the issuance of a state closure permit, the authority of the state is limited to the hazardous component of the wastes.[12] Thus, the state presumably would not have the authority to reject a closure plan or deny a permit, based on objections to the radioactivity left in the tank, as long as the above performance objectives are met.

Section 3116(b) requires the NRC, in coordination with the States of Idaho and South Carolina, to monitor DOE's implementation of the above authority. If the NRC determines that DOE is not in compliance, it is directed to inform DOE, the state, and committees of Congress, including the House Committees on Armed Services, Energy

---

[9] 10 C.F.R. 61.55. Low level waste suitable for near surface disposal is classified according to Class A, B, and C. Class C contains the greatest concentration of radionuclides.

[10] 10 C.F.R. 61, Subpart C.

[11] Limits of human exposure are specified as an annual dose of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ.

[12] There is court precedent regarding the lack of state authority to regulate radionuclides. Most recently, United States v. Commonwealth of Kentucky, 252 F.3d. 816 (6th Cir. 2001).

and Commerce, and Appropriations, and the Senate Committees on Armed Services, Energy and Natural Resources, Environment and Public Works, and Appropriations. Section 3116(b) also requires DOE to reimburse the NRC for expenses, including salaries, that are incurred in performing its monitoring duties for FY2005. In future years, the NRC is required to include such expenses in its annual budget request.

Section 3116(c) states that the waste classification authority in subsection (a) would not apply to any material transported outside of covered states, which are defined as Idaho and South Carolina in Section 3116(d). Thus, the law allows tank wastes in South Carolina and Idaho to be classified and disposed of according to Section 3116(a), as long as South Carolina waste remains in South Carolina and Idaho waste remains in Idaho.

Section 3116(e) addresses the effect of the entire section on other laws and regulations and their application within Idaho and South Carolina. The provision states that the authority in Section 3116(a) shall not "impair, alter, or modify the full implementation of any Federal Facility Agreement and Consent Order or other applicable consent decree" for a DOE site. These documents specify federal and state requirements applicable to waste disposal and cleanup, and establish legally binding time frames for disposal and cleanup actions. Thus, it appears that Section 3116 leaves the existing agreements for Savannah River and the INEEL intact, and would not permit DOE to leave more waste in the tanks than previously agreed to. Other provisions in Section 3116(e) specify that the authority in subsection (a) is binding only in Idaho and South Carolina and that it does not override certain other statutes relevant to waste disposal.

Section 3116(f) clarifies the availability of judicial review under the Administrative Procedure Act (APA).[13] The APA grants any person "suffering legal wrong because of agency action, or adversely affected or aggrieved by agency action" the right to judicial review of agency action. Section 3116(f) subjects to judicial review "any determination made by the Secretary or any other agency action taken by the Secretary pursuant to this section," as well as any failure of the NRC to carry out its monitoring and reporting responsibilities.[14] Under the APA, courts may overturn final agency actions that are (1) contrary to law or a constitutional protection, (2) beyond statutory power, (3) not consistent with applicable statutory or regulatory procedures, or (4) unsupported by substantial evidence. However, environmental organizations have expressed concern that the opportunity for citizen suits may be restricted, if public notice of agency actions is not provided. Although Section 3116 does not require public notice of determinations regarding waste classification and disposal, DOE may be required to provide it under other federal laws, such as the National Environmental Policy Act and the APA. The disposal of the tank wastes is also subject to a state-approved closure plan, the preparation of which may provide opportunity for public notice under state law.

---

[13] 5 U.S.C. 701-706 (judicial review provisions).

[14] Under the APA, judicial review must await a "final" agency action or "[a]gency action made reviewable by statute ...." (5 U.S.C. 704). To be "final," an action must "mark the consummation of the agency's decisionmaking process," and must determine "rights or obligations" or give rise to "legal consequences." Bennett v. Spear, 520 U.S. 154, 177-178 (1997). However, P.L. 108-375 specifies that DOE's actions are reviewable in court. Thus, it would appear that even if such actions would not qualify as "final" under the above, judicial review would remain available.

Although the waste disposal authority in Section 3116 is permanent (unless repealed), funding to implement it is subject to annual authorization and appropriation. Section 3117 authorizes $350 million for FY2005 which DOE requested for its High-level Waste Proposal, but makes this funding available for "any defense site acceleration completion activities," not just those limited to grouting. Of this amount, $189 million is authorized for Savannah River, $97 million for the INEEL, and $64 million for Hanford. The amounts for Savannah River and the INEEL could be used to implement the authority provided in Section 3116 for the grouting of tank wastes, or for any other activities to accelerate cleanup for which DOE has existing authority. Funding authorized for Hanford presumably is not made available for grouting tank wastes, as the authority for this disposal method in Section 3116 does not include Washington state.

Section 3146 also authorizes $1.5 million for DOE to arrange for the National Academy of Sciences (NAS) to study the radioactive and hazardous characteristics of the tank wastes at Savannah River, the INEEL, and Hanford; DOE's plans to dispose of and monitor these wastes; and alternatives for disposal.

(For a relevant discussion of appropriations, see CRS Report RL32852, *Energy and Water Development: Appropriations for FY2006*, "Disposal of Tank Wastes" section.)

Potential Implications for Environmental Cleanup

DOE estimates that the cleanup of the Savannah River site will be complete in 2025 at a cost of nearly $29 billion, and at the INEEL in 2035 at a cost of $14 billion. The disposal of the tank wastes at these sites is among the greater challenges to completing cleanup, along with remediation of existing soil and groundwater contamination. The authority in Section 3116 has implications in terms of cost and pace of cleanup. DOE estimates that grouting residual tank wastes at the Savannah River site would cost between $3.8 million and $4.6 million per tank, compared to a cost of greater than $100 million per tank to remove and dispose of all of the waste, and to clean and remove the tank.[15] The per tank closure costs at the INEEL likely would be lower, because the tanks there contain less waste than those at the Savannah River site. In addition to potential cost savings, closing the tanks by grouting the residual wastes arguably would be faster than removing, treating, and disposing of them by other means.

There also are implications in terms of environmental risk. If the grout is effective in solidifying the residual wastes and containing it safely in the tanks, this disposal method could provide a less costly and faster means of closing the tanks. On the other hand, if the grout does not mix thoroughly with the waste left in the tanks, the possibility of future leaks and resulting environmental contamination remains. In such event, DOE would be liable for remediating resulting contamination according to applicable federal and state requirements. Depending on the extent of contamination and remedial actions selected to address it, the time and costs to clean up contamination from tanks that may continue to leak could offset the initial savings from grouting the residual wastes.

---

[15] DOE, *Savannah River Site High-Level Waste Tank Closure Final Environmental Impact Statement*, DOE/EIS-0303, May 2002, p. S-21.