



September 7, 2004

### **Summary of Responses to FY 05 Defense Authorization Conference Committee Questions**

- *NRDC v. Abraham*, 271 F.Supp. 2d 1260 (D.Idaho 2003), or the “HLW Decision,” does not bar DOE from removing high-level radioactive waste (HLW) from the tanks. Nor does the HLW decision bar DOE from separating some portion of that waste into a stream that meets low-level radioactive waste (LLW) standards and disposing of that waste outside of a geologic repository.
- Section 3116, DOE’s response to the HLW Decision and a proposal currently in the Senate’s FY 05 Defense Authorization bill, is a significant change to the entire structure and purpose of the Nuclear Waste Policy Act (NWPA), not a “clarification.”
- Section 3116 does not set cleanup standards of “99 percent,” “most of the radioactivity,” or an “inch and half of waste at the bottom of the tank.” In fact, it sets no cleanup standard whatsoever and leaves the matter of how much radioactive waste to leave behind entirely up to the DOE.
- Under the current NWPA, the Environmental Protection Agency (EPA) and the Nuclear Regulatory Commission (NRC) regulate the geologic disposal of HLW – and decide what is (and what is not) HLW. DOE may not unilaterally decide that HLW has magically been transformed into “waste incidental to reprocessing.” If Section 3116 becomes law, EPA, NRC and the states will not have meaningful oversight over the amount of radioactive waste DOE decides to leave in the tanks.
- NRDC and over 170 organizations stand with Idaho, Washington, Oregon, New York, and New Mexico and object to Section 3116. It is only the State of South Carolina – who sided with us as recently as the end of March 2004 – that has submitted to DOE’s budget-threatening tactics. Via Section 3116, DOE could get what it could not obtain in court, an exemption from the NWPA in South Carolina and the ability to reclassify HLW as “incidental waste” without any congressional or state oversight.

**Question #1**

In a document on the NRDC website (<http://www.nrdc.org/media/pressreleases/040603.asp>), it claims that the language on WIR in the Senate version of the National Defense Authorization Act “will allow DOE to abandon potentially millions of gallons of highly radioactive waste in leaking tanks in South Carolina.” Please describe how less than one percent of residues that may be left in the tanks in South Carolina add up to millions of gallons? Please define what NRDC means by abandon?

**Response #1**

Regarding how much waste could be left in any one tank as “waste incidental to reprocessing” (WIR) under Section 3116, nowhere in the proposed legislation is there a limitation on how much waste can be abandoned in the tanks or anything resembling a quantifiable cleanup standard. The decision to leave up to 1 percent, 10 percent, 50 percent or any amount is a decision left to the discretion of the Energy Secretary. See Section 3116 at **Attachment 1**. Section 3116 mandates no cleanup standard, either by volume of HLW that may be left in the tank (number of gallons) or by amount of radioactivity (number of curies).

Regarding the amount of HLW at issue in this matter, according to South Carolina (see **Attachment 2** at 6-10, dated 24 March 2003), recently there were nearly 37 million gallons of HLW in the SRS tanks containing approximately 426 million curies of radioactivity. Of those 37 million gallons, approximately 3 million gallons are sludge at the bottom of the tanks (approximately 8% by volume) and approximately 34 million gallons are liquid (approximately 92% by volume). More than half of the radioactivity (approximately 226 million curies, or approximately 53%) is in the sludge and approximately 47% of the radioactivity is in the liquid. It is undisputable that DOE can readily remove most of the liquids. For the sake of argument, if DOE removed all of the liquids and most of the concentrated radioactive sludge – leaving 1% of the volume total (all sludge) – nearly 28 million curies [ $226 \text{ m} * 0.01 / (3/37) = 27.9 \text{ m}$ ] of radioactivity would be left in the water table beneath a layer of grout.

Even a million curies of high-level radioactive waste is an extraordinary amount of radioactivity. To limit occupational exposure to 5 rems per year (the applicable standard), a worker’s maximum allowable annual ingestion of cesium-137 is 100 microcuries (*i.e.*, 0.0001 curies). Public drinking water limits are even approximately 1,000 times less.

At SRS the 51 HLW tanks vary somewhat in terms of capacity (*i.e.*, gallons), height of waste when full (*i.e.*, fill height) and gallons of waste per inch (*i.e.*, fill factor):

<b>Tank Type</b>	<b>Tanks</b>	<b>Capacity (gal)</b>	<b>Fill Height (inches)</b>	<b>Fill Factor (gal/inch)</b>
I	12	750,000	276.8	2,710
II	4	1,030,000	294.3	3,500
III	27	1,300,000	370.4	3,510
IV	8	1,300,000	367.2	3,540
<b>Average</b>		<b>1,150,000</b>	<b>341.9</b>	<b>3,326</b>

The reference to “less than one percent” reflects a view that DOE will ultimately remove all but the last couple of inches of waste in the tanks. If, for example, two inches of waste were to be left in each tank, the amount would represent 0.58% of the full volume of the tanks, or approximately 0.92% of the actual volume of the 37 million gallons, since the 37 million gallons now in the tanks represents 63% of the total capacity.

With respect to the four tanks “cleaned” so far—all are F-Area, Type IV tanks having 1,300,000 gal capacity and a fill factor of 3,540 gal/inch—the amounts of waste left in the tanks are:

Tank	Actual Residual (from DOE table)	EIS assumption
17:	7,280 gal = 2.11 inches containing 478 curies	2,200 gallons
18:	6,730 gal = 1.95 inches containing 20,500 curies	1,000 gallons
19:	16,800 gal = 4.87 inches containing 50,600 curies	1,000 gallons
20:	3,500 gal = 1.01 inches containing 104 curies	1,000 gallons

The data for tank 19 does not support the contention that DOE will leave only one percent of the waste in the tanks, itself an extraordinary amount of radioactivity.

These tanks had relatively low concentrations of radioactivity in the sludge before bulk waste removal commenced as DOE started with the easiest tanks to clean. Thus, the residual activity in these initial tanks is not representative of the residual radioactivity in tanks yet to be “cleaned.”

Please note that in the table above we have also presented the amount of waste that DOE in its SRS Tank Closure Environmental Impact Statement (p. C-18) assumed would remain in the tanks. DOE explicitly stated, “These volumes are an assumption for modeling purposes only and do not represent a commitment or goal for waste removal.” [DOE/EIS-0303, May 2002, Table C.3.1-2, footnote a, p. C-18] What remains in the four tanks is 3.3 to 16.8 times greater than the EIS assumption. This is significant when one examines the EIS calculations of groundwater dose calculations in the Tank Closure EIS, Table 4.2.2-5, p. 4-37. (**Attachment 3**) These calculations are something of a black box since most of the underlying assumptions are not presented. Nevertheless, the EIS results show extraordinarily high doses near the tank farms. At one meter from the H-Area tank farm the dose peaks at 100,000 millirems per year, i.e., 100 rems/year! These doses are projected to peak several thousand years after tank closure. See Tank Closure EIS, Figure 4.2.2-1, p. 4-39. (**Attachment 4**). More importantly, the estimated concentrations of radioactive sludge in all of the 51 SRS tanks vary by a factor of 4,000 (from 0.22 curies/gallon in Tank 19, estimated before cleanout, to 901 curies/gallon in Tank 34. (*See Attachment 5*, the chart of DOE’s own numbers for HLW in the SRS tanks as of 23 February 1999).

The significance of this discussion? If DOE abandons the amount of waste in Tank 34 that they plan to abandon in tank 19 (approximately 16,800 gallons), more than 15 million curies would be left in one corroding tank sitting next to the Savannah River.

NRDC's primary concern has not over the unlawful closure of the initial two tanks, but the millions of curies that could be abandoned under the WIR process. *See Attachment 5* for a full tank by tank listing of the approximately 426 million curies in the SRS tanks.

Finally, in response to the last part of Question 1, in this context "abandoned" means "to withdraw protection support" or "to cease from maintaining or using." Following grouting and "closure" of the tanks, it is our belief that DOE has no intention of removing any additional waste from the tanks or further maintaining the integrity of the tanks. While DOE can be expected to environmentally monitor the tank fields as long as DOE has custodial responsibility over the sites, it is not contemplated that the tanks would be monitored for any specified period of time beyond that. There is no requirement for markers to alert future generations to the hazards posed by the waste as is required of the geologic disposal site(s) for high-level radioactive waste. NRDC is in lock-step with the prevailing attitude of the scientific community by using the term "abandon." The National Academies had this to say on the performance of grout in binding radioactive waste:

Predicting performance in resisting water infiltration can be difficult because of uncertainties that include the degree to which the first layers of grout take up the residue, the water pathway effects of the cold joints between successive pours of grout, and the effects of preferential corrosion of the tank metal and penetrating structures (thereby offering a partial bypass path). Moreover, waste tank residue is likely to be highly radioactive and not taken up in the grout, so there is substantial uncertainty associated with the volumetric classification and average concentration of the waste and prediction of the isolation performance of the system.<sup>1</sup>

## **Question #2**

The same NRDC document asserts that DOE is trying to reclassify waste in the tanks at the Savannah River site. Does the NRDC view all of the waste in the tanks as high level waste which would have to be disposed of at a deep geologic repository?

## **Response #2**

All the waste in the tanks is currently HLW.<sup>2</sup> However, not all that waste must ultimately be disposed of in a deep geologic repository as some of that HLW, removed from the tanks and treated to reduce its fission content, may be disposed of elsewhere if it meets applicable requirements. NRDC, along with the states, has held this position consistently throughout the litigation and throughout DOE's efforts to have the HLW court decision

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<sup>1</sup> National Research Council, Commission on Geosciences, Environment, and Resources. Board on Radioactive Waste Management, Committee on the Remediation of Buried and Tank Wastes, Long-Term Institutional Management of U.S. Department of Energy Legacy Waste Sites. Washington, DC: National Academy Press. 2000, p. 40.

<sup>2</sup> "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." *NRDC v. Abraham*, 271 F.Supp.2d 1260, 1265 (D.Idaho 2003) (emphasis added).

legislatively reversed. *See*, NRDC's August 19, 2003 letter to Speaker Hastert. **Attachment 6.**

In our August 19, 2003 letter, we stated:

The Secretary misinforms Congress when he asserts that the HLW Decision means that the agency must send all waste in the tanks to a deep geologic repository. The HLW Decision directs DOE to remove the waste from the tanks and that the HLW must go to a deep geologic repository as Congress directed in the NWPA. Importantly, the HLW Decision **does not** necessarily mean that all the waste that is exhumed from the tanks must go to a repository. Once that HLW has been removed from the tanks, **if DOE can treat and separate that HLW so that some portion of the waste does not exceed concentrations for low-level radioactive waste**, then DOE may have the option of sending the highly radioactive portion to a repository and the substantially less radioactive portion to a low-level waste disposal site. DOE had this waste management authority prior to the HLW Decision and this authority was unchanged by the Court's decision. The HLW Decision changes nothing in DOE's waste management authority, but it bars DOE from violating the law by disposing of HLW in tanks.

Our position remains unchanged. While the HLW Decision means that all HLW must go to a deep geologic repository as Congress directed, it does not mean that waste exhumed from the tanks must go to a repository. The HLW Decision simply bars DOE from abandoning untreated HLW in the tanks.

The four directly affected states of Idaho, Washington, South Carolina and Oregon concur with this reading of the HLW Decision and stated succinctly:

The court's ruling allows DOE to proceed with retrieval and treatment of liquid waste from tanks ... If the wastes in question are not highly radioactive following treatment, DOE has the ability now to develop a classification strategy to qualify these wastes for management, including disposal, outside a high-level waste repository. What the court rejected was giving DOE free rein to override national policy as expressed in the Nuclear Waste Policy Act.

States' August 12, 2003 letter. **Attachment 7.**

NRDC does not take the position that every gram of waste in the tanks must be removed from the tanks. DOE, however, is required to meet radiological exposure limits for the general public in the vicinity of the tank farms after the tank are closed and the site has been released for public use. If DOE were required to remove as much as practicable and leave no waste in the tank that exceeds LLW standards (10 C.F.R. § 61.55) prior to the introduction of grout or any other stabilizing material — NRDC would find this acceptable. But setting any new standards should follow a public rulemaking process with participation of all the effected parties, including the states.

**Question #3**

Does the NRDC object to the use of grout to stabilize radioactive waste in all cases?

**Response #3**

No, NRDC does not object to the use of grout in all cases. DOE's unlawful incidental waste exemption would have allowed DOE to cover any amount of HLW with grout as a substitute for removing, treating, and appropriately disposing of the waste. Section 3116 would, unfortunately, allow DOE the unchecked authority it failed to receive from the Federal Court. Echoing our concerns is the statement by the National Academies on the performance of grout in binding radioactive waste cited in Response #1.

NRDC does oppose DOE's "junk science" methodology of averaging the concentration of radioactivity in the sludge with the near-zero concentration of radioactivity in the grout when there is negligible mixing of the grout with the waste under it. This was done by DOE in an attempt to mislead the Court and regulators into believing the residual waste as "low activity" waste.

**Question #4**

Does the Idaho Federal District Court opinion in *NRDC vs. Abraham* prevent DOE from removing the High Level Waste in the tanks? Does the opinion prevent DOE from then segregating high activity from low activity tanks waste?

**Response #4**

No and No. *See* Response #2 above. Regarding waste removal, the HLW Decision should not impact the program plan or its costs in the short-term as DOE should continue to empty the tanks of liquid HLW. As the States noted (*see Attachment 7*), the HLW Decision "allows DOE to proceed with retrieval and treatment of liquid waste from the tanks." In the longer-term, DOE will have to invest in technologies that ensure removal of the highly radioactive sludge rather than simply abandoning it in place.

Regarding segregation of high-activity and low-activity waste, as we stated in Response #2, the HLW Decision does not mean that all the waste that is exhumed from the tanks must go to a repository. Once HLW has been removed from the tanks and treated so that some portion of the waste does not exceed concentrations for low-level radioactive waste (LLW), then DOE may have the option of sending the highly radioactive portion to a repository and the substantially less radioactive portion to a LLW disposal site. DOE had this waste management authority prior to the HLW Decision and this authority was unchanged by the Court's decision. The HLW Decision changes nothing in DOE's waste management authority, but it bars DOE from violating the disposal requirements of the NWPA.

**Question #5**

If the answer to either of the above is yes where in the opinion is the prohibition?

### **Response #5**

We believe the opinion has no such prohibition. In fact, the opinion expressly states that HLW may be reclassified. To wit, “[w]hile 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.” 271 F.Supp.2d at 1265 (emphasis added). Additionally, the Court went on to note that “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 ... 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.” *Id.*

Again, DOE should proceed with tank waste removal as safely and expeditiously as possible. The final disposal path for such treated and solidified waste should become readily apparent after treatment – if the waste meets LLW standards, then it can be disposed of as LLW. If that waste does not meet LLW standards, then as the NRC notes, it should be disposed of in a geologic repository. *See* NRC Waste Classification, 10 C.F.R. § 61.55(a)(2)(iv).

### **Question #6**

Is it the goal of the NRDC to prevent tank waste from being removed from the tanks?

### **Response #6**

No. It is not the goal of NRDC to prevent tank waste from being removed from the tanks. The goal of the original lawsuit was to prevent DOE from awarding itself unfettered authority to abandon any amount of HLW (and potentially millions of curies of radioactivity) it deemed “incidental” in corroding, aging steel tanks. In fact, NRDC is in resolutely in favor of removing waste from the tanks as safely and expeditiously as possible. Additionally, the SRS’s Defense Waste Processing Facility has continued to remove and treat HLW from the tanks unabated throughout and subsequent to the District Court litigation. *See Attachment 8*, March 11, 2004 New York Times.

### **Question #7**

Is it the goal of the NRDC is to have all tank waste vitrified for disposal in a high-level waste repository?

### **Response #7**

No. *See* the responses provided to Questions #2, #4 and #5 above. Waste that has been treated to reduce fission content such that it meets LLW standards may be disposed of as LLW. Put simply, it is NRDC’s goal to see that radioactive waste is disposed of appropriately. Section 3116 and DOE’s efforts are a dramatic departure from nearly half a century of agreement on how to dispose of HLW. More than thirty years ago, DOE’s predecessor, the Atomic Energy Commission, made this point abundantly clear:

The Commission does not now regard the storage of liquid high-level wastes in tanks as constituting an acceptable method of long-term storage. Commission experience with its tank storage of liquid high-level wastes is extensive and while

tank design, construction and maintenance have improved, the fact remains that tanks can deteriorate and leak ... Over periods of centuries one cannot assure the continuity of surveillance and care which tank storage requires.

35 Fed. Reg. 17531.

**Question #8**

Is it the goal of the NRDC goal to prevent separation of the tank waste into high activity and low activity constituents? (Low-level in this question would assume that the waste meets Class C low level waste concentration limits as set out in 10 C.F.R. 61.55)

**Response #8**

No. *See* the response to Questions #2, #4 and #5 above.

**Question #9**

Is it the goal of the NRDC goal to require DOE to remove the tanks from the ground?

**Response #9**

No. At no point has NRDC asserted that the tanks themselves must be removed.

**Question #10**

Does the opinion address low-activity waste?

**Response #10**

No. In fact, the Court appropriately and expressly avoids the issue when it notes “[i]t 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 issue in this case falls within NWPA’s definition of HLW.” *See* 271 F.Supp.2d at 1265.

**Question #11**

Does the opinion establish activity levels for waste either going to a repository or not going to a repository?

**Response #11**

No. The Court did not overreach and establish activity levels for “high” or “low” activity wastes. The NRC has already set standards for LLW (*see* NRC Waste Classification, 10 C.F.R. § 61.55). And as the amici states noted, the Court’s decision only confirmed long-standing national policy – which is that “the highly radioactive material that is the result of the reprocessing of spent nuclear fuel” be disposed of in a geologic repository. 42 U.S.C. § 10101(9), (12).

**Question #12**

Would NRDC support establishment of NRC and EPA criteria via a rule making for tank closure?



**Response #12**

Yes. NRDC has no objection to an open, formal rulemaking for tank closure with EPA and NRC setting criteria for closure. Since EPA has primary regulatory authority for setting the general standards and guidance for radiological exposure, including geologic disposal of HLW, it would be appropriate for EPA to precede NRC in the formal rulemaking.

**Question #13**

Would NRDC support establishment of NRC and EPA criteria via a rule making for tank closure that would include the waste remaining in the tank?

**Response #13**

Yes. See our responses to Question 12 and the last paragraph of our response to Question 2. Again, we would not support the disposal of HLW under a layer of grout in corroding steel tanks. In that regard we stand in agreement with the position taken by the AEC over 30 years ago.

**Question #14**

Would NRDC support establishment of NRC and EPA criteria via a rule making for tank closure that would include the waste removed from the tanks that is not going to go to a repository?

**Response #14**

We think any rulemaking setting criteria for potential reclassification of waste removed from the tanks should be separate from the tank closure process. That said, we have no objection to EPA and NRC establishing criteria through formal rulemakings with public participation. NRC already has standards for LLW disposal. While these could be improved, we see no basis for establishing more relaxed requirements for the low activity solid waste resulting from the treatment of HLW removed from the tanks.

**Question #15**

Would NRDC support the ability of the states to establish criteria for tank closure more restrictive of NRC and EPA criteria?

**Response #15**

Yes. Presuming the NRC and EPA engaged in a formal rulemaking and have set criteria for tank closure along the lines in Response #14, we have no objection to a state setting more restrictive closure conditions should they do so via appropriate public notice and comment.

**Question #16**

Would NRDC sit down with the DOE and the states and engage in serious settlement discussions?

## **Response #16**

Yes. Indeed, NRDC has repeatedly demonstrated a willingness to engage in mediation of this dispute. Please see the collected **Attachment 9**, where NRDC sought the involvement of all the affected states in a dispute resolution process (and the States responded positively). Notably, Senator Murray (WA) succinctly summarized the mediation efforts of both the plaintiffs and the States on the Senate Floor this past June. Senator Murray stated:

The Natural Resources Defense Council brought a lawsuit against the Department of Energy in Idaho district court. Before that case went to trial, the NRDC and the States offered to settle the issue. Unfortunately, the Department of Energy did not appear to take that effort seriously, and they rejected that cooperative approach. This is an important point. When the NRDC and the States offered to work out these issues outside of the court system, DOE rejected their offer. So the case went forward and DOE lost... One would expect at this point that DOE would go back to the plaintiff and the States to settle the issues. But that is not what happened. Instead, the Department ...immediately came running here to Congress asking for legislation to do what the Idaho court had rejected. Shortly after that decision, the Idaho district court sent out an order asking parties to consider mediation. The NRDC and the States quickly agreed to the court's request. Amazingly, DOE rejected the court's request. I believe this is an absolutely critical point because it demonstrates the Department has never approached this issue with a mindset open to considering the States' concerns or those of the winning plaintiff. This is the second time DOE rejected offers by other interested parties to cooperatively address this issue. This was a tremendous opportunity to try and reach broad consensus, and DOE passed it up. The court's mediation offer would have had a neutral court-appointed mediator and a very good forum for resolving differences. In fact, this could still happen, and it should. My point in walking through the history of the issue is to highlight the fact that the Department of Energy has had many opportunities to resolve this issue with the States and with the original litigants. It rejected State offers to resolve issues before litigation went forward. And more amazingly, it rejected the Idaho district court's request for parties to use mediation after it lost the case. The States and litigants accepted the court's offer. DOE rejected it, and that is inexcusable.