III. Environmental Cleanup vs. Nuclear Weapons Buildup

A. INL'S Environmental Management Plan

A number of events converged in the last ten to fifteen years that conspired to fundamentally alter the DOE's nuclear weapons complex. First, public outrage over environmental, safety, and health violations forced the closure of many of DOE's production sites. Second, the end of the Cold-War meant that previous production levels of nuclear weapons could not be justified. Indeed, with the Salt Treaties, there is now a warhead surplus that poses its own disposal problems. Third, the mortgage payments on the environmental legacy of the Cold War could no longer be deferred. This mortgage, originally estimated to range between $360 and $500 billion. The last estimate (1996) dropped to a range between $189 and $265 billion still ranks as the largest public works project in the history of the country. These reduced cost estimates reflect DOE's ability to cut corners on cleanup.

The bomb makers devised a series of new plans to restructure the DOE Complex. Complex-21, and Complex Reconfiguration are two such plans launched in the early 1990's. Basically, what these plans envisioned was a smaller leaner nuclear production and testing complex using designated "Super-Sites". INL and Savannah River were at the top of the Super-Site list. Even these sites were in bad shape with aging facilities that were many decades beyond their design life. The bomb makers desperately wanted modern nuclear production capacity that would meet current standards. So they shifted modernization projects from the Defense Program budget to the Environmental Management Budget in the early 1990s to ease passage through Congress, and avoid public scrutiny.

A detailed DOE budget analysis for FY-92 by Heart of America Northwest in *The Dirt in the USDOE's Nuclear Waste Clean-up Budget* further revealed how DOE diverted $547,859,000 from clean-up to subsidize Atomic Energy Defense Nuclear Materials Production programs. "Forty-four % of all `clean-up account' construction projects were found to be for weapons production and research missions, instead of clean-up."[Dirt @iii] "The 1992 cost of these projects that do not belong in the clean-up account is actually the tip of the iceberg. Over the course of the complete construction schedules for these projects, they will cost the Clean-up Account $821.484 million. (Based on the USDOE listed Total Estimated cost, or TEC, for each project) [Dirt @ 22] INL's "clean-up" construction projects supporting defense production missions for FY-92 is $12,995,000; and $91,600,000 over the complete multi-year construction schedules. [Dirt @ 33]

Funding, through 1998, for the ANL-W pyroprocessor for spent fuel is yet another project characterized as a waste management budget item when it should be a Defense Program item. See Section II(D). This is a back-door attempt to modernize the nuclear materials production capacity under the guise of waste management. Spent fuel requires no processing to meet acceptance criteria at disposal repositories. Also see Section I Inspector General Report.

The first years of the Clinton Administration changed some of the old culture but not as much as DOE's critics had hoped. Funding for nuclear weapons was decreased and cleanup funding was increased. Unfortunately, the new 1994 Republican Congress reversed these changes. Now nuclear weapons funding is increasing by $40 billion and cleanup is decreased by $4.4 billion over five years. DOE's 1998 Defense Programs appropriations increased six percent over 1997 and again the budget request for these programs in 1999 increase 8.6 % over 1998. DOE's 1998 Environmental Management appropriations were down 2.5% from Fiscal Year 1997.

DOE's INL 1996 Baseline Environmental Management Report shows a change from $30 billion 1995 INL cleanup estimate reduced to a $19 billion 1996 cleanup estimate. [BEMR(d)] This is not surprising because previously DOE thought they would have to do serious cleanup at INL. However, the State and EPA allowed DOE get away with inexpensive cover-up caps over dump sites as opposed to exhuming the waste and properly disposing of it at a repository. Thus, the cleanup cost estimates are nearly half of earlier projections. The following table shows INL cleanup costs between 2003 and 2020 add up to $ 7,985,550,000 that demonstrates the legacy costs of preventable gross waste mismanagement.

INL 2003 -2020 Cleanup Costs

FY-Year	Including NRF/Regulatory Support $	Excluding NRF	Source
2003		484,709,000	FY-05 P.34
2004	567,310,000		FY-05 P.34
2005		534,600,000	FY-05 P.34
2006		538,083,000	FY-07 P.144
2007		519,604,000	FY-07 P.144
2008		522,838,000	FY-07 P.144
2009		489,239,000	FY-07 P.144
2010		469,168,000	FY-07 P.144
2011		412,000,000	FY-14 P.59
2012		389,800,000	FY-14 P.59
2013		355,766,000	FY-15 P.29
2014		393,593,000	FY-16 P.127
2015		404,929,000	FY-17 P. 121
2016		401,919,000	FY-17 P. 121
2017		370,088,000	FY-17 P. 121
2018	595,198,000		FY-20 P. 29
2019	638,805,000		FY-20 P. 29
2020	553,225,000		FY-20 P. 29
Totals	2,354,538,000	8,640,874,000	
Total 2003-2020		10,995,412,000	

Sources:

Department of Energy FY (for each year + PG.#) Congressional Budget Request Environmental Management, Volume 5

DOE FY 2014 Congressional Budget Request Environmental Management, DOE/CF-0088, Volume 5

Department of Energy FY 2015 Congressional Budget Request, DOE/CF-0100, Volume 5

Department of Energy FY 2016 Congressional Budget Request DOE/CF-0111 Volume 5

Environmental Management Department of Energy FY 2017 Congressional Budget Request DOE/CF-0123, Volume 5

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Section III. B. INL Site-wide Environmental Impact Statement

The Environmental Defense Institute (EDI) supports the Department of Energy's (DOE) involuntary decision to conduct a site-wide Environmental Impact Statement (EIS) of the Idaho National Engineering Laboratory (INL). Responding to a citizen law suit, (EDI was a co-plaintiff) DOE initiated in 1991 two Programmatic Environmental Impact Statements (PEIS) of its nuclear weapons production complex. One PEIS covers Environmental Restoration and Waste Management (ER/WM PEIS) or "Cleanup", and the other PEIS covers Reconfiguration or "Modernization" of DOE's production Complex. In 1992 DOE decided to do a third PEIS or Spent Nuclear Fuel PEIS. These three PEIS's do not meet the complex wide programmatic National Environmental Policy Act (NEPA) requirements. DOE failed to comply with the Court's Stipulation by not producing the ER/WM PEIS but only generated a WM PEIS. The citizens groups went back to Court in May 1997 to force the Department to meet its legal obligations on the remaining ER PEIS. As of January 1998, DOE has been found in contempt of court. The importance of this ER PEIS lies in a number of the following issues.

- DOE would be obliged to establish complex wide cleanup standards.
- DOE would have to articulate where and how much of the waste is going to be disposed.
- Define the impact of workers from inter-site transport
- Institutional controls and land usability/long term stewardship
- Priority for complex wide cleanup

DOE is also responding to a June 28, 1993 Summary Judgment from US District Court, District of Idaho. Judge Harold Ryan found in favor of the State of Idaho and the Shoshone-Bannock Tribes. He issued an injunction on additional DOE waste shipments to INL until a comprehensive EIS was conducted and a Finding of No Significant Impact was determined. Ryan found that; "In light of all of these changes and new proposals, the court strongly believes that DOE must prepare a comprehensive, site-wide EIS addressing all nuclear waste activities at INL." [Ryan @35]

"On December 22, 1993, Senior US District Judge Harold L. Ryan issued an Order ratifying proposed modifications to the US District Court's Opinion and Order of June 28, 1993. Subsequently, the Notice of Non-compliance Consent Order between the Idaho Department of Health and Welfare (IDHW) and DOE, signed April 3, 1992, was amended on March 22, 1994, to include mixed waste management stipulations outlined in the ratification Order dated December 22, 1993. The amended Consent Order requires DOE to take the following actions:" [WINCO-1216]

* "Calcine all high-level liquid radioactive waste that does not contain sodium on or before January 1, 1998."
* "Calcine or otherwise process as much sodium-bearing high-level liquid radioactive waste (sodium-bearing waste) as DOE and the IDHW mutually agree is practicable by January 1, 1998."
* "...evaluate and test Freeze Crystallization, Radionuclide Partitioning, and Precipitation, the sodium-bearing treatment technologies identified by DOE in a November 15, 1993 letter."
* " Select the sodium-bearing waste pre-treatment technology, if necessary, and calcine or processing technology by June 1, 1995."
* "within ninety (90) days following the selection of ... technologies for sodium-bearing waste calcination and calcine conversion, ... enter into negotiations [with IDHW] on the construction schedule for any necessary facilities to implement the technologies."
* "On or before March 31, 2009 ... permanently cease use of [tank farm tanks with pillar and panel vault construction] and all associated vaults; or .... achieve compliance with all secondary containment requirements set forth in IDAPA ss 16.01.5009 (40 CFR ss 265.193)."
* "On or before June 30, 2015 ... permanently cease use of [all remaining tank farm tanks] and all associated vaults; or ... achieve compliance with all secondary containment requirements set forth in IDAPA ss 16.01.5009 (40 CFR ss 265.193)."

[WINCO-1216]

The Environmental Impact Statement (EIS) is over 4,200 pages, yet it offers less definitive information and waste stream characterization than the 1977 INL Waste Management EIS that was one eighth the size. The 1977 EIS at least offered some historical data on radioactive releases so that the reader could evaluate to some degree the cumulative environmental impact of future activities. This EIS offers little or none of this essential information. In order to satisfy NEPA, the INL ER/WM EIS must comprehensively assess the cumulative environmental impact of past and proposed government activities at INL, which it did not.

Summary of Issues in the INL Environmental Impact Statement (EIS)

* The EIS lacks sufficient detail to be considered a comprehensive programmatic site-wide Environmental Impact Statement.
* The EIS fails to be conducted within the context of DOE's Reconfiguration PEIS, ER/WM-PEIS, and implementation plan for compliance with the Federal Facilities Compliance Act.
* All public testimony at Idaho hearings on the two PEIS's must be included in a the EIS comments.
* EIS fails to consider all INL operating facilities and their related operating systems from 1947 to the present and fully assess and characterize their waste streams, (i.e.. reactors, fuel processing, incinerators, Calciner, evaporators, etc.).
* All activities within the boundaries of INL must be included in the EIS. By definition, this must include all facilities listed on Tabulation of Facilities at the INL, and the New Integral Fast Reactor (IFR).
* The EIS fails to fully characterize Navy waste streams for NRC disposal criteria compliance.
* All current and planned non-INL activities upon which successful implementation of INL activities depend, must be fully characterized and the potential environmental impacts of such activities not coming on line as anticipated identified, (i.e.. WIPP and Yucca Mt. dumps).
* The EIS fails to consider fully all planned INL facilities, their related operating systems and characterize their waste streams.
* The use of radioactive waste percolation ponds must be suspended.
* Radioactive and chemical waste must be disposed in fully compliant and permitted RCRA hazardous waste and/or EPA/NRC permitted radioactive waste disposal sites.
* Decontamination and Decommissioning waste volumes and toxicity must be fully characterized.
* EIS fails to fully assess the ICPP high-level waste tanks and vaults to include structural, constituents, seismic, leakage into/out-of vaults, and service line leaks.
* A full mass balance assessment of water pumped from aquifer and waste discharge volumes over INL's history.
* Compilation of Snake River Aquifer information into a single data base and a development of a new model to analyze contaminate dispersion.
* Declassification of all environmental, health and safety documentation relevant to establish historical INL source terms (radioactive releases).
* Analysis of the seismic and volcanic hazard that is fully peer reviewed by ID Geologic Survey and other qualified experts.

Section III. C. DOE's High-Level Waste Environmental Impact Statement

The Department of Energy Idaho Operations Office (DOE) announced in 1998 its intent to prepare a High-Level Waste and Facilities Disposition Environmental Impact Statement (EIS). This is a requirement of the National Environmental Policy Act for all federal agencies. The scoping phase of this process is intended to give the public an opportunity to comment on the what issues must be addressed in the EIS. Unfortunately DOE refuses to provide the required hearings where citizens can be assured that their comments will become a part of the public record. Instead, DOE is offering feel-good focus group meetings and butcher paper pads.

Primarily, the EIS focus is the legacy of reactor irradiated fuel reprocessing at the Idaho Chemical Processing Plant (ICPP). Reactor fuel was reprocessed to extract highly enriched uranium and other isotopes for military nuclear programs. The high-level radioactive waste left behind after reprocessing includes both 1.7 million gallons of liquid waste in eleven underground tanks as well as 3,800 cubic meters (134,140 cubic feet) of solidified liquid waste known as calcine. The Calciner is basically an incinerator that took some of the liquid waste and burned off the liquid portion and mixed the residual ash with a granular calcine material so it could be more easily moved to underground storage silos at the ICPP.

DOE offers three alternative actions in their EIS scoping literature; 1.) no-action; 2.) proposed action; and 3.) non-separations action.

The EIS no-action alternative would continue the solidification of the liquid high-level waste into calcine

and indefinitely store it in underground silos at the ICPP. Tank sediments and liquid portions (30-40,000 gallons) that cannot be removed using existing transfer pumps will also remain in the tanks permanently.

The EIS proposed action, preferred by DOE, would include building a pretreatment plant to separate the transuranic (heavier than uranium) or "high-activity" waste portions from the "low-activity" portions. This separations process would be applied to both the liquid and the calcine waste. The "high-activity" portion would then be vitrified into a glass-like form and shipped to a geologic repository. The "low-activity" portion would be mixed with cement (grout) and dumped back into the ground at INL or back into the old waste tanks on top of the remaining liquid and sediments.

The EIS non-separation alternative would treat both the liquid tank waste and the calcine for permanent disposal in-place at the INL or at an out of state geologic repository. Residual liquid and tank sediments would be mixed with cement and left in the old tanks.

DOE is legally obliged to offer EIS alternatives that meet all regulatory and legal requirements. However, none of the above three alternatives meet this basic test. Among the regulations that would be violated are the Resource Conservation Recovery Act, the Nuclear Regulatory Commission regulations on radioactive waste disposal, the U.S. District Court Settlement Agreement between the State of Idaho, Navy, and DOE, and finally DOE's own Record of Decision on Spent Nuclear Fuel Management and INL Environmental Restoration and Waste Management EIS.

Why don't the EIS alternatives meet regulatory and legal requirements? The Nuclear Regulatory Commission (NRC) defines high-level waste by the process that created it as opposed to specific characteristics. High-level is, (1) irradiated reactor fuel, (2) the waste generated by the processing of irradiated reactor fuel, (3) the solids into which the liquid wastes were converted. There is no question that the entire contents (liquid and sediment) of ICPP waste tanks and the calcine are high-level wastes. As such NRC disposal regulations require a permanent geologic repository and waste shipped to the repository must meet acceptance criteria. Anything less than total extraction of all the tank contents and vitrification of the waste will meet these requirements.

Additionally, the Resource Conservation Recovery Act (RCRA) classifies the ICPP tank waste as a mixed hazardous radioactive waste. RCRA requires vitrification treatment of this waste prior to disposal. Land Disposal Restrictions in RCRA will not allow the tanks or silos to be used as a disposal site. Therefore, DOE could not get a RCRA closure permit for the tanks or silos without first decontaminating them.

The separations technology DOE is pushing in Idaho is reminiscent of the Hanford grout scenario. DOE is trying to pull the same high-level/low-level nonsense at INL apparently thinking Idahoans are not aware of the Hanford escapade. The radionuclide partitioning technology is an unproven process of separating out the transuranic elements (heavier than uranium) from the rest of the waste and calling it "high-activity."

The driver to this treatment approach is volume reduction. The separations approach minimizes the volume shipped to a geologic repository and maximizes the volume dumped back into the ground. The Department also thinks that it can ship the smaller volume of high activity waste to another site to be vitrified, thereby avoid building a plant at INL. Since DOE is building a vitrification plant at Hanford, the Department wants to ship the high-activity portion of INL's high-level waste there for treatment thereby saving the $3 billion cost of the Idaho vitrification plant.

DOE's attempt to use grout (cement) to stabilize the "low-activity" waste is a Hanford rerun that generated so much public opposition that DOE was forced to cancel the project. The question of waste classification played a crucial role in ending the Hanford grouting program. DOE tried in 1990 to delist much of its high-level liquid waste saying it was not really high-level and therefore could be mixed with cement (grout) and dumped back into the ground. The Oregon and Washington State regulator's position is that all the tank farm waste is high-level and therefore regardless what DOE's separations treatment produced, it must be managed and disposed as high-level wastes.

Hanford now is planning to vitrify both the high and low activity parts of its high-level wastes. The low-activity parts are to be stored on-site in a retrievable form. Thomas Tebbs with the Washington Department of Ecology and Dirk Dunning with the Oregon Department of Energy believe this is a step in the right direction; but that it is a waste of resources to separate the high and low wastes; best just vitrify the whole volume together in one operation and ship it to a permanent repository.

Another very troubling part of DOE's INL plan is to leave the high-level tank farm sediments (heels) in the

tanks. "The ICPP Tank Farm heels will not be removed and the Tank Farm will be closed under RCRA [Resource Conservation Recovery Act]." "The closed Tank Farm would probably meet the subtitle D landfill standards for industrial waste." Subtitle D is a municipal garbage dump classification. It is obvious, even to the most pedestrian observer, that garbage and high-level radioactive waste are different. If DOE is allowed to implement any of its EIS options it will literally translate into INL becoming a permanent high-level waste dump site.

The tank heels can be removed by conventional dredging techniques currently being used at Oak Ridge or use the Hanford Tank Sluicer Mechanism. DOE believes: "However, it is not practical to remove all of the heels from the INL tanks, decontaminate the equipment, and remove all surrounding soils due to technological, economic, and health and safety factors involved." In a technical journal called *Initiatives in Environmental Technology Investment* the history of tank heel removal equipment is explained along with the most recent application with Oak Ridge's Bethel Valley high-level tanks.

"Power Fluidic devices have been used in nuclear installations in the United Kingdom for the past 20 years, and more than 400 systems have been installed with no failures, to date. They offer an alternative to mechanical pumps, which are generally more expensive, produce large volumes of secondary waste, and tend to fail frequently, increasing the risk to maintenance workers. Steam jets require less maintenance but have limited ability to pump solid/liquid mixtures, operate on one fixed flow rate, and heat and dilute tank contents." [Initiatives]

The Environmental Defense Institute (EDI) suggests that the best approach is to directly vitrify the whole volume of the tank liquid, the tank heels, and the calcine wastes without any partitioning or separation of high-activity and low-activity wastes. This vitrified "road-ready" waste would then be put into an on-site monitored retrievable storage facility until a safe permanent disposal site is developed. The State of Idaho must fully review the failed Hanford grout program before committing to a similar project at INL. DOE's continued efforts to run the evaporator to reduce the liquid volume in the ICPP high-level tanks though on the surface appear to minimize the risks of leaks, could ultimately exacerbate any heal removal program and increase the amount of waste left in the tanks if proceed with the preferred alternative of grouting the heals in place.

The Final Report from the Hanford Tank Waste Task Force got it right by recommending: "The high cost and uncertainty of high-tech pretreatment and R&D threatens funding for higher performance low-level waste form, vitrification, and cleanup. Put wastes in an environmentally safe form, using retrievable waste forms when potential hazards from the waste may require future retrieval and when retrievability does not cause inordinate delays in getting on with cleanup. Let the ultimate best form for the waste drive decisions, not the size nor timing of a national repository. Accept the fact that interim storage, at least, of the waste in an environmentally-safe form will occur for some time at Hanford. Select a waste form that will ensure safe interim storage of this waste." The Institute for Energy and Environmental Research's 1997 report Containing the Cold War Mess discussion of the Hanford tank problems are applicable to the INL situation.

"However, the current predisposition in the DOE seems to be to pour cement into the tanks over the residual waste volume as a method of closure. This is being done on the one tank that has been emptied of sludge at the Savannah River Site, pursuant to an Environmental Assessment. This closure method could leave tens of thousands to millions of curies of long-lived radionuclides in each tank at the time of closure. It would put these wastes in forms that would be very difficult to retrieve, because they would be hardened cement. This method of closure is converting the few programs actually reducing risks a weapons site (i.e., vitrification of high-level waste in the Defense Waste Processing Facility) into a potential long-term liability, in a manner analogous to examples that we have discussed where short-term waste management 'solutions' are converted into long-term environmental problems.

"Pouring cement into the tanks should be ruled out as a method of closure, especially as there is insufficient understanding of the long-term risks to soil and groundwater from residual waste and there has been insufficient retrieval technology development. If hardened wastes cannot be retrieved, then the focus for such waste should be on technology development, because they do not pose risks that would be mitigated by cementation in the near-term. Cementing would also make remediation of the vadose zone far more difficult than it already is. Cementing the tanks appears to be DOE's way of washing its hands of the environmental problem of tank decommissioning." [IEER(g)@212]

In summary, the repeated mantra "get on with cleanup" in the Hanford Waste Tank Task Force is repeated in public interest group reports. DOE is wasting precious resources by refusing to recognize the public's demand

for real solutions to the radioactive waste problem. DOE must get on with cleanup and apply proven technologies that will put all radioactive waste into a stable vitrified form for on-site storage for the near-term because there are no guarantees on any permanent geologic repositories coming on line soon.