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EDI Comments
Draft Environmental Impact Statement
for Recapitalization of Infrastructure Supporting
Naval Spent Nuclear Fuel Handling
Naval Reactors Facility
Idaho National Laboratory
Department of Energy

DOE/EIS-0453-D

Submitted by
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Naval Nuclear Propulsion Background

Admiral Bruce DeMars' Statement to U.S House Armed Services Committee in 1993 on the Navy's environmental and safety record states: "U.S. nuclear powered warships have now steamed over 93 million miles ---4,100 reactor years of safe operation –**without a reactor accident** or release of radioactivity which has had a significant effect on the crews, the public, or the environment." [Emphasis added] [1]

More recent reporting in the Department of Defense Fiscal-Year 2013, U.S. Naval Nuclear Propulsion Budget: "Naval Reactors … achieved 148 million cumulative miles of **safely-steamed,** militarily-effective nuclear propulsion plant operation." [emphasis added] [2]

The USS Thresher (SSN-593) nuclear-powered attack submarine sunk in the North Atlantic during deep-diving tests approximately 220 miles east of Boston Massachusetts on 10 April 1963. Judging by the 129 crew members and shipyard personnel who were killed in the incident, historic context and significance, the sinking of Thresher was then, and remains today, the world's worst submarine disaster. This was the first U.S. nuclear submarine lost at sea.

Greenpeace reports that: "There have been several dramatic collisions between U.S. and Russian nuclear submarines since 1960's In one case in June 1970 in the Pacific involving the U.S. submarine USS Tautog [sic] and Russian Echo-class submarine K-877 submarines in both crews thought the other submarine had sunk after the collision." [3] [4]

It is illegal to lie to Congress (Contempt of Congress); however, the Nuclear Navy has no problem with giving glaringly false formal testimony and statements to Congress who apparently is not objecting. Then Idaho Governor Cecil Andrus said: "The federal government thinks it's larger than the people, Andrus said, accusing the head of the nuclear Navy of dishonesty. "They're going to be in for a fight if this [waste plan] gets through." [5]

"On July 13, 2015, *Advocates for the West* submitted initial comments on behalf of Governors Andrus and Batt to the Department of Energy on its draft Supplemental Analysis for two proposed commercial spent nuclear fuel shipments to INL. Executive Director Laird Lucas slammed DOE for providing "false and misleading information to the public," including by misrepresenting Idaho's willingness to waive the 1995 Batt Settlement Agreement, which prohibits the shipments. The comments also faulted DOE for avoiding its duty to fully disclose its planned actions and evaluate alternatives under National Environmental Policy Act (NEPA).

"The Governors' comments also pointed out that DOE has failed to provide relevant documents under [Freedom of Information Act] FOIA, which Governor Andrus requested in January [2015]. The DOE has withheld or redacted dozens of pages of documents, effectively stonewalling the public – see 'DOE Redacted Docs' below." [6]

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[1] Statement of Admiral Bruce DeMars, U.S. Navy Director , Naval Nuclear Propulsion before the Military Applications of Nuclear Energy Panel of the House Armed Services Committee, 28 April 1993, pg. 4 & 5.

[2] FY-2013 Congressional Budget, Naval Reactors, Pgs. 480-489.

[3] Testimony for the U.S. Senate Select Committee on Intelligence Hearing Held 15 August 1992 by Joshua Handler, Greenpeace Nuclear Free Seas Campaign, coordinator pg. 6; "So long as Russian, U.S. and U.K. submarines continue to play cat and mouse games under the water there will [be] the possibility of a fatal disaster taking nuclear reactors to the ocean floor."

[4] Wikipedia, SS Thrasher.

[5] Andrus wants Kempthorne to block Navy's waste plan," Associated Press, Daily News, 7/21/93.

[6] Advocates West website, "Keeping Nuke Waste out of Idaho," 8/1/15.

Outlying year funding supports Naval Reactors' core mission of providing proper maintenance and safety oversight, and addressing emergent operational issues and technology obsolescence for 103 reactor plants. This includes 71 submarines, 11 aircraft carriers, and four research and development and training platforms (including land-based prototypes).

The Nuclear Navy represents more nuclear reactors than is currently in the U.S. commercial nuclear electrical power generator fleet. Due to the veil of secrecy around this large navy military program, the public is not allowed to be appraised of its operations. The same hazard/public health/waste issues that accompany commercial nuclear power generation equally apply to the Nuclear Navy Propulsion Program. Unlike commercial nuclear power reactors that are spread around the country, the Nuclear Navy Spent Nuclear Fuel operations are concentrated at the Idaho National Laboratory (INL). Due to its size and significant environmental impact, Idahoans must get access to the details of its operations because of Navy's ½ century of contributing to contaminating the Snake River Plain Aquifer.

Idaho Senator Kemthorne stated: "No more quick fixes. That's what got us in this fix we are in today. The navy is not the villain and it may in fact be the innocent victim of the federal government's nuclear waste non-policy. The Navy can no longer give its waste to the Department of Energy, and say, 'We've done our job, and we have a great record,' while the Navy's waste sits in one facility plagued by corroding containers in unlined pools sitting above one of nation's largest underground aquifers. Even the contractor believes these pools should be shut down. Once the Navy's fuel arrives at INL, it's placed in pools with other nuclear waste. The Navy's name is still on it, you can't walk away ….just as the people of Idaho can't walk away. No more quick fixes." [Emphasis in original text] [7]

In August 2015, John McKenzie director of program regulatory affairs said project costs for building a new Naval Reactors Facility (NRF) "is actually the low-cost answer, and even that is $1.6 billion." More than $500 million would be spent on construction. The rest would be design, equipment costs and a "management reserve," McKenzie said. Nuclear Navy currently has 81 nuclear powered warships including submarines and aircraft carriers. [8] [9]

"Start of construction on the new Expanded Core Facility [at INL/NRF] M-290 Receiving/ Discharge line-item construction a necessary project for receipt and processing of aircraft carrier spent nuclear fuel." "Construction: Reflects an increase in funds for the Remote-handled low-level Waste Disposal Project [at INL], Prototype Radiological Work and Storage Building, staff building… FY-2012 ($39,900,000); FY-2013 ($49,590,000). " [10]

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[7] Opening Statement, Senator Dirk Kemthorne, July 28, 1993, Subcommittee on Nuclear Deterrence, Arms Control and Defense Intelligence, pages 2 and 3.

[8] Navy officials pitch new $1.6 billion nuclear facility, Posted on Post Register, August 4, 2015, by Luke Ramseth

[9] Green Peace reported as of 1992, the Nuclear Navy has 126 vessels active and 63 in retirement. The 126 active vessels contain 147 reactors. The 63 retired vessels contain 65 reactors. The Navy has produced, over its history, a total of 600 reactor cores for its 189 commissioned vessel fleet. Within the next eight years, the Navy will retire an additional 85 submarines. Counting refueling and retired reactors, INL has received a total of 259 core assemblies. In eight years that number will jump to 359 core assemblies. The reactor shells are buried at DOE's Hanford site spent nuclear fuel are sent to INL's Naval Reactors Facility.

[10] DOE/EIS-0453-D, herein after referred to DEIS.

As discussed below, the Navy's dumping of radioactive waste currently at the RWMC, will be dumped at the new Remote-Handled Low-Level Waste Disposal Project adjacent to Advanced Test Reactor that is also in the Big Lost River flood zone. See Attachment # 1 below. This new remote-handled dump will not solve the Navy's waste disposal problem; it only leaves one leaves one thoroughly contaminated site that CERCLA is forcing closed (RWMC Subsurface Disposal Area) and opening a new one further down the river.

Naval Nuclear Propulsion Program Cost (dollars in thousands) [11]

FY-2011	FY-2012	FY-2013	FY-2014	FY-2015	FY-2016	FY-2017
985,526	1,080,000	1,088,635	1,108,391	1,129,186	1,151,021	1,175,975

The State of Idaho has a significant role in the waste management end of the Naval Nuclear Propulsion Program. The Addendum to the 1995 Settlement Agreement [12] outlines significant concessions by current Idaho Governor Otter in terms of the Navy's ability to maintain its nuclear program spent nuclear fuel (SNF) waste management needs. Previous Governors' Andrus and Batt (who negotiated the 1995 Settlement Agreement) are legally contesting Governor Otter's abrogation of the original 1995 Settlement Agreement and Consent Order. [13]

"The order by U.S. District Court Judge Harold Ryan prohibited any further shipments of nuclear waste to INL near Idaho Falls until a comprehensive assessment is made of their impact on the environment and public safety. The judge said the Energy Department was not honest with him and failed to keep their word to the state. He said a binding court order was the only way to cure that 'callous disregard for legitimate concrete concerns raised on behalf of the citizens of Idaho'. It appears that DOE is quietly attempting to make INL the nuclear waste repository for the United States and the rest of the world,' Ryan said." [14]

U.S Senator Larry Craig (R.-Idaho) Testimony to Congress stated: "We are here today because the Department of Energy in conjunction with the U.S. Navy made a decision not to reprocess Naval Fuel at the Idaho Chemical Processing Plant in April of 1992. At that point the Idaho National Laboratory (INL) became a nuclear waste storage facility. You will hear today that storage was temporary and that the Navy Fuels were to be disposed of in the geological repository. What you most likely will not hear is that such a disposal is intended for the second

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[10] Navy officials pitch new $1.6 billion nuclear facility, Posted on Post Register, August 4, 2015, by Luke Ramseth

[10] Green Peace reported as of 1992, the Nuclear Navy has 126 vessels active and 63 in retirement. The 126 active vessels contain 147 reactors. The 63 retired vessels contain 65 reactors. The Navy has produced, over its history, a total of 600 reactor cores for its 189 commissioned vessel fleet. Within the next eight years, the Navy will retire an additional 85 submarines. Counting refueling and retired reactors, INL has received a total of 259 core assemblies. In eight years that number will jump to 359 core assemblies. The reactor shells are buried at DOE's Hanford site spent nuclear fuel are sent to INL's Na

[11] FY-2013 Congressional Budget, Naval Reactors, Pgs. 480-489.

[12] Addendum to the 1995 Settlement Agreement, signed by, Admiral Kirkland Donald, Director Naval Nuclear Propulsion Program; C.L. "Butch" Otter, Governor of Idaho; Lawrence Wasden, Idaho Attorney General; et.al.

[13] Laird Lucas legal director for Advocates for the West are representing Andrus and Batt. www.advocateswest.org.

[14] Lewiston Morning Tribune, 7/1/93, "Andrus disputes Navy's claim of need for nuclear shipments", pg.13A.

or third geological repository, not the first. I need not reiterate for this Committee the problems that been experienced in Nevada with evaluating a geological repository for mainly commercial fuels. But, let me tell you there are a few people here who don't plan on allow Idaho's concerns to go ahead. Those concerns are that our state is slowly and quietly becoming a nuclear waste dump because the federal government has shamelessly fallen down on the job. Let me speak for Idahoans here today –THAT IS NOT ACCEPTABLE. I ask that the committee carefully consider the testimony of two Senators and a Governor and a lot of Idahoans watching." [emphasis in original text] [15]

On the surface, a member of the public likely will not appreciate what this all means to them and future generations that will be forced to deal with these current political decisions. The Navy, like commercial nuclear power generators, is ignoring the spent nuclear fuel waste issue. Even Congress ignores the problem of what to do with all of this highly radioactive and therefore hazardous waste. The attempt at a permanent deep geologic repository at Yucca Mt. failed after investing decades and billions of tax-payer money wasted. Still Congress cannot find the political will to initiate a search for a new repository. Neither commercial nuclear power generators nor the Nuclear Regulatory Commission have not faced up to what to do with all the non-fuel parts (now called Greater-Than-Class-C low-level radioactive waste) of spent nuclear fuel. See Attachment # 2 for an estimate and listing of this waste. [16] The Nuclear Navy has the same problem, except they are largely unregulated.

Specifically, each Navy Spent Nuclear Fuel (SNF) shipment to Idaho National Laboratory (INL) undergoes a process (explained below) that separates the uranium fuel from non-fuel structural parts. The uranium is stored for eventual disposal in a high-level waste geologic repository yet to be established. The highly radioactive non-fuel structural parts end up being dumped above Idaho's sole source aquifer. DOE's Supplement to Evaluation of Naval Reactors Facility Radioactive Waste Disposed of at the Radioactive Waste Management Complex from 1953 to 1999, lists the 22 radionuclides in the Navy's waste that total 952,986.68 curies. [17] See Attachment # 3 (Table 5, pg. 18) below for the list of individual nuclides.

Admiral DeMars Testimony continues: "Over 500 shipments have been made to date [1993] without any accidents or adverse effects on the environment. We anticipate making about 10% more spent nuclear shipments in the next decade than we did in the previous one..." [pg. 1] During the cold war highly enriched uranium was a precious resource, recovered through chemical reprocessing at the Idaho National Laboratory (INEL) for subsequent use as fuel for the weapons production reactors. In that era, reprocessing made economic sense and supported the nation's strategic goals. However, reprocessing involves chemical dissolution of the spent fuel, release of fission products, and a seven fold increase in the amount of high level waste at INEL.

"As part of the inspection process, [Expanded Core Facility] ECF crops off the non-fuel bearing material for disposal as low-level waste, and ships the spent fuel itself to the Chemical Processing Plant where it has been stored in water pits, sometimes for years awaiting

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[15] Testimony of U.S Senator Larry Craig (R.-Idaho) Before the Committee on Armed Services Subcommittee on Strategic Forces and Nuclear Deterrence, 222 Russell Senate Office Building, July 28, 1993.

[16] Explanation of Significant Differences Between Models Used to Access Groundwater Impacts for Disposal of Greater-Than-Class-C-Like Waste Environmental Assessment for the INL Remote-Handled Low-Level Waste Disposal Project, page 1, INL/EXT-10-19168, Table 2 citing DOE-EIS-2011 shows the significant volume and curie content generated by reactors.

[17] Supplement to Evaluation of Naval Reactors Facility Radioactive Waste Disposed of at the Radioactive Waste Management Complex from 1953 to 1999, J. Giles.etal., April 2005,ICP/EXT-05-00833, Table 5, pg. 18.

reprocessing. [pg. 2]

"Storing naval spent nuclear fuel in water pits eliminates the generation of extra high level waste. [pg.3] Shipyards that defuel nuclear warships are in six states; Washington, Hawaii, Maine, Virginia, California and South Carolina." [18]

Historically, before regulations prevented it, the NRF SNF was dumped in INL's Subsurface Disposal Area (SDA). DOE records show that between 1952 to 1980, 27,707,700 grams or 27,707.700 kilo grams. [19] NRF is the largest contributor of SNF dumped at INL's dump. See list of SNF generators to the RWMC below.

INL's Explanation of Significant Differences Between Models Used to Access Groundwater Impacts for Disposal of Greater-Than-Class-C-Like Waste Environmental Assessment for the INL Remote-Handled Low-Level Waste Disposal Project "includes an ` evaluation of the radionuclides inventory, disposal facility configuration and transportation from the facility to a hypothetical receptor via the groundwater pathway." [20] See Attachment # 3 below that shows the proximity to Big Lost River. When this picture is compared to Attachment 1 aerial photo, it is clear this site is in a flood zone which must legally disqualify it.

The Navy has been using Idaho as its dumping ground for over ½ century, with tragic impacts on contaminants migrating into the underlying Snake River Plain Aquifer. This EDI report offers details about the extent of the "known" contaminant in the aquifer. Currently, there is a significant deficiency in both air and ground water monitoring on the part of DOE, NRF, EPA and Idaho Department of Environmental Quality (IDEQ). The discontinuation of monitoring is by agreement between DOE/NRF and IDEQ.

The Naval Reactor Facility's (NRF) Expended Core Facility (ECF) at INL receives the whole reactor fuel assembly module. This facility has expanded to include a Dry Cell for cutting larger aircraft carrier reactor cores to accommodate the increased size, volume from refueling and decommissioning. The fuel rods are not easily removed from the rest of the assembly as are most conventional reactor cores. The steel structural core assemblies are designed to withstand combat shocks and maintain fuel rod configuration within the core during combat scenarios.

Naval spent nuclear fuel assemblies have non-fuel-bearing structural components above and below the fuel region to maintain proper support and spacing within the reactor. Generally, these upper and lower non-fuel-bearing structural components are removed in preparation for packaging. Non-fuel structural material is removed in the ECF water pools using an underwater cutting saw in a process known as resizing. This resizing can also occur in the Dry Cell. The non-fuel-bearing structural material removed from naval spent nuclear fuel assemblies is (in EDI's view incorrectly) classified as low-level radioactive waste (LLW). Based upon the radiation levels exhibited by this LLW, this waste should be designated either as high-level or remote-handled (RH) Greater-than-Class C Waste.

To minimize a criticality in the uranium parts of the fuel, "Neutron poison absorbs neutrons

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[18] Statement of Admiral Bruce DeMars, U.S Navy Director , Naval Nuclear Propulsion before Nuclear Deterrence, Arms Control and Defense Intelligence Subcommittee of the Senate Armed Services Committee on Nuclear Spent Fuel Shipments 28 July 1993.

[19] Radioactive Waste Management Information System Database (P61SH090, and P61SH070, Run Date 10/24/89)

[20] Explanation of Significant Differences Between Models Used to Access Groundwater Impacts for Disposal of Greater-Than-Class-C-Like Waste Environmental Assessment for the INL Remote-Handled Low-Level Waste Disposal Project, page 1, INL/EXT-10-19168, Table 2 citing DOE-EIS-2011 shows the significant volume and curie content generated by reactors.

to ensure nuclear fission [criticality] does not occur. When necessary to reduce reactivity, neutron poison material is inserted into the naval spent nuclear fuel assembly." [21]

"The ECF water pool area contains various materials handling equipment to support operations, including cranes and transfer carts. This equipment is vital to supporting naval spent nuclear fuel handling operations. Walls and stainless steel gates divide the water pools into smaller work areas, or zones. This partitioning makes it possible to drain a small portion of the total water pool or isolate an individual volume when maintenance or repair is required. The water pool walls and floors are covered with a fiberglass or epoxy coating which is highly resistant to radiation damage, easy to decontaminate, and serves as an extra barrier to water leakage." [22]

According to Thereon Bradley [23], former Manager of the NRF, explained that the Expended Core Facility (ECF) cuts (or in some cases unbolts) the metal ends from the spent fuel elements in order to inspect fuel and cladding integrity and evaluate how the fuel survived service in the reactor. [Bradley] Other core structural components are also cut off the spent fuel assembly in hot (dry) cell. "All naval fuel modules have non-fuel bearing metal structures above and below the fuel region to facilitate coolant flow and maintain proper spacing within the reactor. These upper and lower non-fuel bearing structures must be removed to permit inspection of the modules. Removal reduces the storage space ultimately required for the fuel by approximately 50%." [24]

The core assembly components containing the uranium fuel sections were previously sent intact to the Idaho Chemical Processing Plant (ICPP) for reprocessing or storage in ICP-666 water canal. This procedure changed when reprocessing ended and NRF kept the uranium in ECF or dry cask storage. [25] The remaining reactor non-fuel element parts and structural components have always been sent to the INL Radioactive Waste Manage-Management Complex (RWMC) for shallow burial as "low-level" Class A or B waste. Until the mid-1970's this unregulated waste was dumped in the center of pits and trenches while less radioactive waste was dumped around it to provide additional shielding. Post-1970s practice is to use individual unlined holes or "soil vaults" at the RWMC Subsurface Disposal Area (SDA). See Attachment # 4 that shows TRU and Soil Vaults, and Attachment # 5 Diagram of SDA numbered pits, trenches and soil vaults. Currently, NRF dumps this waste in an array of concrete lined vaults at the south end of Pit-20.

On some select core assemblies, the Navy does a destructive examination in the water pool or hot cell by cutting the fuel elements for a detailed evaluation of the uranium fuel and its cladding. In the past this process of cutting away the structural components was routine when the fuel was being reprocessed at the ICPP (now called INTEC) and the structural parts had to be separated from the uranium fuel components prior to reprocessing, as was the practice prior to 1990. The ICPP and other spent fuel generating facilities also routinely cut off metal parts of fuel rods on non-Navy fuel that was slated for reprocessing or storage, and sent these metal components to the RWMC/SDA for shallow land burial as "low-level waste."

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[21] DOE/EIS-0453-D, pg. 1-4

[22] DEIS pg. 1-6

[23] Thereon Bradley has since died of a brain tumor.

[24] DEIS(b) @ B-10

[25] Reprocessing involves the chemical or pyro-reprocessing to reclaim the enriched uranium/plutonium for nuclear bombs or new reactor fuel.

The Navy now acknowledges that "some of the structural material exceeds the 10 CFR 61 Class C concentration limits and is being stored in the water pools. Under the Low-Level Radioactive Waste Policy Amendments Act of 1985 (P.L. 99-240), DOE is responsible for ensuring safe disposal of all Greater than Class C waste in a facility licensed by the Nuclear Regulatory Commission." [26] This is a very recent policy shift by the Navy to even consider this waste Greater than Class C. Still, the Navy continues to ship this waste to the RWMC violating its own policy and DOE continues to receive and bury the waste in shallow holes. Extremely limited storage capacity in addition to DOE's inability to account for this waste in storage further challenges the Navy assertions that Greater than Class C waste is going anywhere but to the burial ground. As recently as 7/12/94 this writer observed a heavily shielded transport canister routinely used by the Navy at the RWMC beside a crane ready to unload. See Attachment # 6 for a copy a sample of 4 NRF shipping records to the RWMC Subsurface Disposal Area (SDA).

The Navy admits; "Outdated infrastructure designs and upgrades to ECF structures, systems, and components necessary to continue ECF operations in a safe and environmentally responsible manner present a challenge to the continuity of ongoing ECF naval spent nuclear fuel handling operations. Major portions of the ECF infrastructure have been in service for over 50 years. The maintenance and repair burden necessary to sustain ECF as a viable resource for long-term operations is increasing. The ECF water pools have never undergone a complete refurbishment and have not been upgraded to current seismic standards. The pool does not have a liner, creating the potential for water infiltration into the reinforced concrete structure and the potential for corrosion damage of the reinforcing bar within the structure. The absence of a liner also means the capability to detect and collect small leaks, a common feature in modern water pools, is not present for the ECF pool. Consequently, while the replacement or overhaul of the current water pool is not a matter of urgency that must be done in a very short period, it is something that needs to be planned and started soon (Section 2.3)." [27]

Since this NRF reactor core waste going to the RWMC burial grounds contains long-lived radioactive isotopes due to many years of exposure in the reactor core, it should be classified as high-level waste and treated according to Nuclear Regulatory Commission (NRC) disposal standards. At the very least this waste must be put in NRC Greater than Class C (GTCC) waste category. NRC disposal criteria require that "waste that will not decay to levels which present an acceptable hazard to an intruder within 100 years is designated as Class C waste." [10 CFR 61.7] Class C waste, must, for this reason, be disposed at a greater depth than other classes, or, if that is not possible, under an intruder barrier with an effective life of 500 years. "At the end of the 500 year period," according to NRC regulations, "remaining radioactivity will be at a level that does not pose an unacceptable hazard to an intruder or public health and safety." [Ibid.] The adequacy of the EPA, NRC IDEQ regulations is discussed more fully in the waste dumping in this paper, for instance there is considerable debate over these regulators non-enforcement that allows greater than class-C waste to be dumped in shallow land burial at INL in a flood zone. See Attachment # 7.

DOE data shows that individual NRF waste shipments to the RWMC containing greater than 81,000 curies are not uncommon. See Attachment # 6. The reader must understand that Attachment 6 is two pages of RWMIS that includes more than 12 ring (10 inch thick) binders of

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[26] DEIS(b) @ B-10

[27] DEIS Pg. 1-13

printouts. It also should be noted that this waste is currently dumped in shallow unlined holes (called "soil vaults") that would not qualify as a municipal garbage landfill, much less a RCRA Subtitle C hazardous waste disposal site, or a NRC high-level or Greater Than Class C radioactive waste repository. This dumping will continue until the new Remote-Handled Dump is built next to ATR at INL.

Another category of Navy waste is irradiated test specimens. "The irradiated materials program evaluates small specimens of materials for use in naval reactor systems. The specimens are loaded in sample holders, and the holders are placed in test assemblies at ECF. The assemblies are irradiated at [Advanced Test Reactor] ATR, and returned to ECF for disassembly."... "After completion of the final examination, specimens are shipped to ICPP for storage or to the INL Radioactive Waste Management Complex for disposal." [28] Over 4,450 specimen shipments to and from the ECF have occurred to date. [29]

Summary of Waste Dumped in the Subsurface Disposal Area

Radioactivity of Waste Dumped at the Subsurface Disposal Area 1952-1983

Major Generator	**RWMIS Shipping Roll-up in Curies**
Test Area North (TAN)	63,000
Test Reactor Area (TRA) Currently Advanced Test Reactor Complex	460,000
ID Chemical Processing Plant currently Idaho Nuclear Technology Environmental Complex	690,000
Naval Reactor Facility (NRF)	4,200,000
Argonne-West Currently called Materials Fuel Complex (MFC)	1,100,000
Rocky Flats Plant (RFF)	57,000
Other	55,000
Total	11,000,000
EG&G-WM-10903 @ 6-26	

The above summary of radioactive content of waste dumped is considered understated. The Environmental Defense Institute analysis of the curie content of Navy shipments to the burial ground, for instance, adds up to 8,140,668 curies. [30] However the above DOE data using annual summaries attributes the Navy to only 4.2 million curies or only half as much. DOE admits that the annual summaries are understated. [31]

The ECF was built in 1957. It has four separate unlined concrete water pools that contain 3

[28] DEIS (b) @ B-12

[29] DEIS @ A-9

[30] EDI filed for and received a Freedom of Information Act request that included RWMIS database printouts of all the waste dumped at the RWMC. Our analysis included adding up those shipments and their characteristics.

[31] EGG-WM-10903 @ 6-26.

million gallons of water. The ECF does not meet current spent nuclear fuel (SNF) storage or seismic code requirements. NRF workers claim that 16,000 gallons per day are leaking from the pools. In an attempt to slow these leaks, NRF tried injecting grout around the perimeter of the pools. The grouting caused increased hydrostatic pressure that forced some horizontal leakage into the perimeter access corridor around the pools which then must be pumped out. ECF also lacks a leak detection system. All other fuel storage and processing facilities at the INL with similar characteristics have been designated unsafe and scheduled for closure. Therefore, the Navy's claim "that operation of the INL-ECF does not result in discharges of radioactive liquids" is inaccurate. [32] Since "three separate milling machines in the water pools are used to separate spent fuel components into smaller sections for examination in the shielded cells." [33] NRF suggests that significant contaminates are released to the water in the pools. These processes make the uncontrolled leaks uniquely significant.

The Navy fails to provide seismic analysis documenting that the super structure of the Expanded Core Facility (ECF) can sustain design basis earthquake and accident scenarios during transfer of fuel using the ECF bridge crane. Water Pits 1, 2 and 3 were only constructed to earthquake "Zone 2 earthquake requirements which were judged to be appropriate under the USGS's classification of the area at the time [1957] of their construction." Subsequent USGS requirements for INL raised that standard to zone 3.

Flooding accident scenarios postulated in the INL Environmental Restoration/ Waste Management Draft Environmental Impact Statement (ER/WM DEIS) of Mackey Dam acknowledges that the dam "was built without seismic design criteria" and "additionally, it is not clear how resistant the dam structure is to seismic events" and the fact that "a fault segment runs within 6 kilometers of the Mackay Dam" [34] is more significant than the DEIS allows. Specifically, the 16 hour time delineated for the failed dam flood waters to reach NRF is incredible. Flood waters would move considerably faster than 2 miles per hour. See Attachment # 1 below.

The DEIS inaccurately describes the Borah Peak earthquake as 6.9 when it was actually 7.3 on the Richter scale. This is a significant inaccuracy when DOE analyst Rizzo calculated peak ground acceleration at 0.24. The Special Isotope Separator EIS used a "predicted peak ground accelerations were calculated assuming a 7.25 magnitude earthquake." [SIS EIS] The DEIS does acknowledge that “this beyond design basis earthquake might have a peak ground acceleration of 0.4 g at ECF" which is twice the 0.24 that the facility could sustain. [DEIS (b) @ B-18] Yet the DEIS fails to explicitly acknowledge that there is a significant seismic hazard.

"The [NRF] Expended Core Facility $44 million Dry Cell Project has a dry shielded fuel handling, disassembly, examination and shipping facility, a decontamination shop, and a shielded repair shop. The Dry Cell contains a semi-automated production line to receive and

[32] DEIS(b) @ 5.2-12
[33] DEIS(b) @ B-13
[34] DEIS(b) @ B-17

prepare fuel for shipment to the ICPP for chemical dissolution and recovery of unused uranium. The decontamination and repair shop will be integrally connected to the Dry Cell, and to existing water pits, to allow routine servicing of equipment without removing equipment from a shielded environment. A 10,000 foot extension to the existing facility will be used to house necessary control, receiving, storage and training spaces."

"Core examinations and preparations for shipping and dissolution are currently performed in water pits and hot cells. This method is labor intensive, has notable technical disadvantages, and involves a significant burden of deliberately redundant administrative and physical controls for nuclear safety. The receipt of expended nuclear cores is expected to have increased by 1992. This surge will be compounded because many of these cores will be larger and heavier than those that are currently processed in the water pits. Existing facilities and systems cannot be economically upgraded and automated to meet the projected workload increases. The Dry Cell Project is essential to continued timely handling of expended cores in support of scheduled Navel nuclear-powered vessel refueling and inactivation's." [35]

An unreported nuclear fuel accident occurred at ECF that caused evacuation of the building when a transfer cask was not properly positioned over alignment posts. The bottom door cask had holes in it that are designed to receive the alignment posts on the deck above the water pools so that a tight seal is created when the bottom door opened and the fuel dropped into the water pool. In this accident the posts and holes were not aligned and therefore there was no seal. Workers claim that when the fuel was lowered into the pool, a 25 rad per hour beam escaped between the cask and the pool exposing workers in the area. This 25 rad is considered to be understated by many orders of magnitude. The miss-alignment occurred on one shift and the fuel transfer to the pool occurred on the next shift. [36] This type of accident would not occur at the newer ICPP-666 that is equipped with underwater cask loading and unloading capability as well as fully interconnected pools that keep the fuel below the water surface at all times. Because of severe deterioration of the concrete, leaks in the pool walls, and the gate seal leaks, the ECF pools cannot be isolated.

Navy Waste Characterization

Publicly available summary DOE data recorded between 1952 and 1981 cites the Navy's NRF as dumping 3,195,000 Curie (Ci) in the RWMC, making the Navy the second largest curie

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[35] DOE FY-93

[36] Author's interview with Duane Allen then Oil & Chemical Workers Union, Safety Representative. The ECF cask misalignment accident --- says 25 rem doses. But, when there is gamma radiation from even a portion of a single fuel rod, you can have very high radiation levels. For instance an Advanced Test Reactor fueled test experiment can shine 1 million rem per hour and be lethal for 100 meters. Time, distance and shielding determine the dose. But when the Navy says the dose was perhaps 25 rem for the misalignment, an analyst will wonder if NRF had any real basis for this dose. It could have been significantly higher. Additionally, the fact that this radiation hazard lasted through two worker shifts, many ECF workers would have been affected.

contributor to INL's dump. [37] Yet, DOE's restricted access Radioactive Waste Management Information System Solid Waste Master (RWMIS) Database attributes 187,050,351 curies to Navy's NRF dumping at the RWMC between 1960 and 1981. [38] Between 1960 and 1989 the Navy dumped 188,140,668 curies at the RWMC. [ibid] This figure makes the Navy the largest curie contributor to INL's dump. DOE recently revised these figures claiming a mistake in data entry more fully described below. DOE now claims that there was an entry error in their database that went undetected for 24 years.

DOE/ID recently provided Environmental Defense Institute (EDI) with a copy of EG&G's Radioactive Waste Management Information System (RWMIS) verification process that was initiated because EDI publicized the data of an earlier DOE Freedom of Information request. According to the RWMIS 1/4/88 and 10/24/89 computer runs, there were four waste shipments on 9/15/69 from the Naval Reactors Facility (NRF) to the Radioactive Waste Management Complex (RWMC). The RWMIS lists the times of the four shipments at 820, 830, 840, and 850. The 820 NRF shipments are listed as "metal scrap".

Kloss McNeel, Manager of EG&G's Environmental Technical Support Unit who reported to DOE/ID's Paul Allen (9/7/93) on their verification process of the RWMIS, made a correction to the 9/15/69 shipment number 850 entry that originally contained a 1.8 E+8 (180,000,000) curie entry. [McNeel] The correction included a new curie value of 1.8 E+4 (18,000). EG&G's accompanying explanation includes a copy of the Waste Disposal Request and Authorization form ID 124 that describes the waste as "SCRAP INSERT 176 With Dummy Source and S5W Misc. hardware from disposal effort." This description more accurately describes the 9/15/69 820 shipment listed as "metal scrap" in the 1/4/88 and 10/24/89 database runs. The 820 "metal scrap" waste shipments is missing from EG&G's "corrected" RWMIS 9/24/92 data base run.

Mr. McNeel makes no attempt to account for the deletion of the 820 NRF "metal scrap" shipments to the RWMC. The 850 shipment, which earlier was reported to have a curie content of 1.8 E+8 is described as "011 CORE + LOOP COMP." Clearly, the waste description on form ID 124 does not match the RWMIS 850 waste shipment description. Also, there is no explanation why the curie content on form ID 124 is hand written when the other data fields are type written. Do other shipping manifests for that period also contain hand written entries for curie content? Even if one accepts this change in the data, this still shows the Navy dumped nearly three times (8.14 million) more curies than publicly acknowledged total of 3.1 million curies.

The Navy's reactor core wastes that have been buried at the RWMC must be exhumed at considerable expense and hazard to workers. The core assemblies are extremely radioactive and require remote handling. Individual NRF shipments to the RWMC of 81,000 curies attest to this hazard. Furthermore, the cores are not packaged in any radiation containment unit. NRF officials only acknowledge that the waste is shipped in a canister from the NRF, and the shipping

[37] ID-10054-81@15
[38] RWMIS, P61SH090

canister is returned to the facility.

Until the mid-1970's the Navy dumped fuel element parts and specimens into the RWMC pits and trenches. Since then, the Navy continues to dump reactor core assemblies at the RWMC in "soil vaults", which are defined as shallow (2 to 6 feet diameter) holes in the ground where the waste is dropped in and covered with 3 feet of soil. As of 1979, there are 1,150 "soil vaults" in 20 separate rows. Currently the RWMC is undergoing environmental restoration under the CERCLA Superfund cleanup process. Remediation projects have been underway for over a decade, starting with Pit 9. Even the most pedestrian of observers can see how ludicrous cleanup activities are when dumping continues in the immediate vicinity creating new future Superfund cleanup actions.

The 1985 Low Level Waste Amendment requires DOE take ownership of the NRC licensee of GTCC waste. But as DOE manages its own and Navy LLW it is not required to classify it according to the laws for NRC licensed facilities. DOE does not have to classify its waste as A, B, C except when it wants to send this waste to a state or NRC-licensed facility. See below are exemptions to the Low-level waste law for NRC licensees like commercial power reactors.

TITLE 42 United States Code Annotated 6.427.§ 28.021c; "Disposal of low level radioactive waste; (a) State responsibilities, (1) Each State shall be responsible for providing, either by itself or in cooperation with other States, for the disposal of (A) low-level radioactive waste generated within the State (other than by the Federal government) that consists of or contains class A, B, or C radioactive waste as defined by section 61.55 of title 10, Code of Federal Regulations, as in effect on January 26, 1983;(B)low-level radioactive waste described in subparagraph (A) that is generated by the Federal Government except such waste that is (i) owned or generated by the Department of Energy; (ii) owned or generated by the United States Navy as a result of the decommissioning of vessels of the Unite States result of the decommissioning of vessels of the United States Navy; or (iii) owned or generated as a result of any research, development, testing, or production of any atomic weapons…."

The NRF EIS talks about a seismic assessment for the current ECF, but addresses the basic concrete --- it does not address leakage etc.. It's too complicated to address how they are treating the old current ECF operations. The important thing is that the seismic design for the new facility is the most stringent there is. Detailed very old history on the old ECF doesn't make much difference if they are building the new one.

The unique nature of the Navy spent fuel assemblies and the Naval Reactor Facility's processing/inspection operations is secret. The highly enriched Navy spent fuel waste poses a significantly greater environmental threat (because of the decay heat) than other conventional low-enriched reactor fuel that goes directly into storage cooling ponds. Additionally, the Navy waste going to the RWMC must be classified as high-level waste and/or Class C waste by virtue of the fact that it contains reactor core assembly sections contaminated with long-lived radionuclides. The destructive testing can access the uranium section of the rod which means the

cutting chips will contain uranium. The extremely high curie content of these waste shipments (called canal trash) attests to this fact.

Institute for Energy and Environmental Research's book *High-Level Dollars, Low-Level Sense* challenges the NRC radioactive waste disposal standards: "In examining the NRC regulations, one is thus led to believe that the class limits [Class A, B, C, and greater than C] were derived from the requirements imposed by these hazard definitions and time frames. However, even according to NRC's own definitions of what is 'hazardous' and what is 'acceptable' the time frames of 100 years [Class A] and 500 years [Class C] are logically incompatible with the class limit definitions, raising serious questions about their environmental and public health adequacy." ... "For example, much of the '100 year' waste (Classes A & B), for example, will not decay to NRC-defined 'acceptable' levels in 100 years. Consider nickel-63. Buried at Class B concentrations levels of just under 70 curies per cubic meter, waste containing nickel-63 would still have concentrations of about 35 curies per cubic meter after the institutional control period of 100 years had elapsed. According to NRC regulations, at this point the waste should have decayed to the point where it 'will present an acceptable hazard to an intruder.' Yet, at 35 curies per cubic meter, the waste, if retrieved from the disposal site and re-buried, would still be classified as Class B waste since it has concentrations levels which are 10 times higher than the Class A limits. As a matter of fact, this waste would take a total of well over 400 years to decay just to the Class A upper limits (at which point the NRC regulations would still define it as hazardous for another 100 years if it were being buried for the first time)." [39]

IEER continues: "This analysis makes an even stronger case against the NRC regulations when applied to the Class C limits, which pertain to 'long-lived radionuclides'. Class C waste contaminated with technetium-99, however, buried at concentrations of just under the Class C limit of 3 curies per cubic meter, will be hazardous according to NRC definitions for far longer than 500 years. It will take such waste over the three half-lives - some 640,000 years - just to decay to the upper boundary of Class A levels. The illogical nature of the above regulatory approach is made even more explicit in the NRC's discussion of the 'long-lived' radionuclides in the waste. According to the NRC, in managing low-level waste, 'consideration must be given to the concentration of long-lived radionuclides ... whose potential hazard will persist long after such precautions as institutional controls, improved waste form, and deeper disposal have ceased to be effective. These precautions delay the time when long-lived radionuclides could cause exposures'". [40]

IEER continues: "In essence, there is an admission that the hazard due to long-lived radionuclides 'will persist long after' the controls imposed by the regulations fade away. This is an extraordinary admission of the regulations fundamental inadequacy right in the text of the

[39] IEER @ 74&75
[40] IEER(c)

regulation. The only thing the NRC regulations will apparently do with respect to the long-lived components of low-level waste, is push the hazard into the future, since NRC-mandated controls will, at most, only 'delay the time when long-lived radionuclides could cause exposure'. In the case of many long-lived radionuclides, they will continue to be present in almost exactly the same concentrations when institutional controls have lapsed as when they were first buried." [IEER(c)]

The Nuclear Regulatory Commission (NRC) requires in classifying a specific waste shipment that the part of that volume that contains 90% of the radioactivity be separated and used to determine the concentration and thereby the waste classification. The Navy and DOE continue to use the entire volume of the shipment to calculate the average concentration. The result is that the radioactive concentration appears low because of dilution. The NRC's Staff Technical Position specifically prohibits this practice of factoring in other material as a means of dropping the average concentration. The Navy is also using total volume averaging to avoid NRC regulations in burial of reactor shells at the DOE Hanford site. An EG&G groundwater sampling report found significant radioactive contaminates at the 600 foot level under the INL burial grounds.

Summary of Nuclear Navy Waste
Dumped at INL's RWMC SDA Burial Ground

Year Dumped	Curie Content of Waste *
1960	1,364
1961	6,717
1962 #	20,900
1993	34,933
1964 Navy Knolls Lab. Reactor Core+Loop Comp.	6,400
1965	517,571
1966	787,300
1967	801,100
1968 #	198,600
1969 #	644,000
1970	3,572,048
1971	54,669
1972	10,577
1973	9,411
1974	5,782
1975	4,911
1976	73,348
1977	144,758
1978	34,962
1979	109,171
1980	39,206
1981	19,219
1982	8,401

1983	39,035
1983 NRF S1G Reactor vessel	5,579
1984	372,614
1985	141,784
1986	35,928
1987	29,664
1988	6,722
1989 #	126,400
1990 #	74,120
1991 #	102,600
1992 #	49,300
1993 #	27,560
Total 1960 to 4/1/93	**8,140,668**

Source for above table: [Radioactive Waste Management Information System Master Database, P61SH090, 10/24/89]; [#] [Senate Armed Services Committee, Subcommittee on Nuclear Deterrence, Arms Control and Defense Intelligence, Hearing on shipment of Spent Nuclear Fuel, 28 July 1993, Questions and Answers for the Record, @ 25]

References for above table:
* Curie content of shipments less than 1 curie were not added to the above summary table, therefore, the totals are understated. Also **not included** are Navy contractors, General Dynamics' (Electric Boat Div. and General Atomics Div.) seven shipments of "irradiated fuel" to the RWMC; and General Electric's eleven shipments of "irradiated fuel" and ten reactor "core + loop" assemblies; and Office of Isotopes Specialists' one shipment of "irradiated fuel" to RWMC. DOE and Navy officials publicly deny that spent fuel was dumped at the INL burial ground (RWMC) in direct contradiction to their own data base entries. (See Spent Nuclear Fuel Dumped in Burial Ground that shows 90.282 metric tons of irradiated fuel dumped in RWMC).

Equally significant are spent nuclear fuel related waste shipments to the RWMC burial grounds. This waste includes spent nuclear fuel parts cut off the fuel elements prior to storage and fuel storage "canal trash" that represents over **9,866,112 curies.** The burial grounds are a shallow disposal area that would not meet municipal garbage landfill regulations.

Navy Waste Characterization
Partial listing of isotopes found in Navy waste dumped at INL

Isotope	Symbol	Half-Life in days	Half-Life in Years
Americium-241	Am-241	1.7 E+5	465.7
Antimony-125	Sb-125	877	2.4
Barium-133	Ba-133	12	
Cerium-144	Ce-144	290	
Cobalt-58	Co-58	72	

Cobalt-60	Co-60	1,900	5.2
Chromium-51	Cr-51	27	
Cesium-134	Cs-134	840	2.06
Cesium-137	Cs-137	1.10 E+9	30.17
Europium-154	Eu-154	5,800	15.89
Hafnium-181	Hf-181	46	
Iron-55	Fe-55	110	
Iron-59	Fe-59	45	
Iridium-192	Ir-192	74	
Lead-210	Pb-210	7,100	19.4
Manganese-54	Mn-54	300	
Neptunium-237	Np-237	8.0 E+8	2,191,780
Nickel-59	Ni-59	2.9 E+7	79,452
Nickel-63	Ni-63	2.9 E+4	79.4
Niobium-95	Nb-95	35	
Potassium-40	K-40	.50	
Plutonium-238	Pu-238	3.3 E+4	87.7
Plutonium-239	Pu-239	8.9 E+6	24,131
Plutonium-240	Pu-240	2.4 E+6	6,575
Plutonium-241	Pu-241	4.8 E+3	14.35
Plutonium-242	Pu-242	1.4 E+8	383,561
Promethium-147	Pm-147	920	2.5
Radium-226	Ra-226	5.9 E+5	1,616

Ruthenium-106	Ru-106	365	
Silver-110M	Ag-110M	270	
Sodium-22	Na-22	950	2.6
Strontium-89	Sr-89	50	
Strontium-90	Sr-90	10,512	28.8
Technetium-99	Tc-99	7.7 E+7	210,958
Thorium-232	Th-232	5.1 E+12	13,972,600,000
Tin-119	Sn-119	112	
Uranium-233	U-233	5.9 E+7	161,643
Uranium-234	U-234	9.1 E+7	249,315
Uranium-235	U-235	2.6 E+11	712,328,767
Uranium-236	U-236	8.7 E+9	23,835,616
Uranium-238	U-238	1.6 E+12	4,383,561,644
Zirconium-95	Zr-95	63	

Source: USDOE, Radioactive Waste Management Information System Master Solid Database, 10/24/89

The above table shows clearly how Navy waste dumped in the burial grounds contains Transuranic waste. [41] One of the reasons for this is the lack of precision in cutting off the structural parts of the fuel element in preparation for reprocessing or storage. Destructive tests of fuel assemblies additionally add to the fissile content of the waste stream. In recent DOE documents characterizing the waste streams going to the RWMC they acknowledge presence of, "Irradiated fuel element end boxes that were cut off of the fuel plates in the hot cells. The end boxes may contain some fuel, but generally only activation products". [42] Independent characterization of this waste must be made before more is dumped at the RWMC.

Spent fuel rods from over 40 reactors around the US and the world are being stored at

[41] Transuranic (TRU) waste is "radioactive waste that is not classified as high-level radioactive waste contains more than 100 nanocuries (3700 becquerels) per gram of alpha-emitting transuranic isotopes with half-lives greater than 20 years.

[42] EGG-WM-10903 @ 2-30

various sites around INEEL. Current inventory is 1,225 metric tons total mass. [43] DOE plans on considerable expansion (15-20,000 metric tons) of its spent fuel processing and storage. This Plan is called "Directed Monitored Retrievable Storage", which is the product of nuclear electric utilities forcing the government to take possession of spent fuel. Since a high-level waste repository has yet to be built, the utilities do not want to store the spent fuel on their sites.

Spent Reactor Fuel Dumped at INL's RWMC
Subsurface Disposal Area Burial Grounds 1952 to 1980 [RWMIS] [44]

Generator	Mass in Grams
Materials Fuels Complex (MFC) aka. Argonne Laboratory-West	2,177,150
Idaho Nuclear Technology and Environmental Center (INTEC)	9,246,306
Naval Reactors Facility (NRF)	27,707,700
General Dynamics, General Atomics Division San Diego, CA	22,861,440
General Electric, Vallecitos Atomic Laboratory Pleasanton, CA	11,568,800
Special Power Excursion Test (SPERT) INL	14,517
Test Area North (TAN) INL	16,433,193
Advanced Test Reactor Complex aka. Test Reactor Area (TRA)	273,866
Total Mass in Grams	90,282,972
Total Mass in Metric Tons	90.282

The above preliminary numbers, compiled by the Environmental Defense Institute, are drawn from DOE's Radioactive Waste Management Information System Database (P61SH090, and P61SH070, Run Date 10/24/89) and represent about 57 shipments specifically identified as "irradiated fuel". Not included in the above listing are even more numerous shipments called "un-irradiated fuel", "fuel rods", "control rods", and other reactor fuel not identified specifically as "irradiated". The curie content of these shipments identified as "fuel rods" (>7,000 curies) suggests that they are also irradiated reactor fuel. The above listing also does not include 7 shipments of "irradiated fuel" during the same period to the RWMC Transuranic Storage Area amounting to 621.549 kilograms, and which also were not included in the Spent Nuclear Fuel EIS.

[43] A. Hoskins, WINCO, 7/11/94

[44] Radioactive Waste Management Information Data Base Solid Master Data Base (P61SH090), List for 1954 to 1970, Run Date 3/29/89, pages 517, 518, 519 and 520 (RWMIS).

The Environmental Protection Agency (EPA) found that INL violates the Resource Conservation and Recovery Act and "That the presence and/or release and potential release of hazardous waste from USDOE's facility may present a substantial hazard to human health and/or the environment ..." [45] Substantive corrective action has yet to occur because EPA does not have the authority to shut down any INL facility. Consequently violations are interpreted as a peer review without being binding according to a 1989 Government Accounting Office report. [46] EPA's Oversight budget had been cut by one percent by the Bush Administration at a time when its oversight obligations were the greatest at DOE cleanup sites. Presidents have been cutting EPA's budget since Clinton and further cut EPA's radiation standards and Federal Facility Enforcement Office, and Congress continues to cut EPA's budget by yet another one-third. EPA funding remains flat or lower after the 1996 cuts. Clearly, EPA's regulatory authority will be forced to continue to rubber stamp whatever DOE wants.

Another major assumption that is extensively evoked in the INL Cleanup Plan is 100 years of DOE monitoring and institutional control of the contaminated sites. In real life, when entities break the law, and are required to do major corrective actions in the future, they are generally required to establish a trust fund so that if they again decide to disregard their legal requirements, or are no longer in existence, the funding will be there for the state or local government to do the job. The state of Idaho should therefore, require the Navy and DOE to establish a monitoring/institutional control trust fund to cover those costs at INL. An example of where this issue is important is the current designation that NRF is not in the Big Lost River (one mile away) 100 year flood plain. This designation is due to Big Lost River dams that divert flood waters southwest into spreading areas. These dams and their related water channels require regular maintenance in order to provide that flood protection to NRF and other INL facilities such as the new Remote-Handled Dump near ATR. See Attachment # 1. Prior to construction of the diversion dam, NRF was in the Big Lost River 100 year flood plain. [47] Nuclear Regulatory Commission (NRC) radioactive waste disposal requirements state, "waste disposal shall not take place in a 100 year flood plain." [10 CFR ss 61.50] Institutional control must include diversion dam and water channel maintenance as well as monitoring and fencing of waste.

The Plan states: "The Comprehensive RI/FS Waste Area Group 8 represents the last extensive Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) investigation for the Naval Reactors Facility." This Plan is not "comprehensive" because it excludes the Retention Basin (one of the most contaminated waste sites at NRF) from the CERCLA cleanup process. The Retention Basin (OU-8-08-17) is a large concrete tank that temporarily holds liquid radioactive and chemical wastes (presumably to allow short-lived

[45] EPA(a),9/15/87
[46] GAO/RCED-89-13, p.3
[47] NRF Remedial Investigation/ Feasibility Study (RI/FS@5).

isotopes to burn off) prior to discharge to the various leach pits. The Plan fails to state that the sludge in the basin contains cesium-137 at 192,700 pico curies per gram (pCi/g)(risk-based action level is 16.7 pCi/g) and Cobalt-60 at 20,410 pCi/g. [48] A long history of Basin leaks assures significant soil contamination under the basin and therefore should have been included in the Comprehensive Plan but never was.

The Plan's exclusion of the NRF Expanded Core Facility (ECF) leaks additionally demonstrates the incompleteness of the so called "comprehensive" Remediation Plan. The ECF, built in 1958, does not meet current spent reactor fuel storage standards that require stainless steel liner, leak containment, and leak detection systems. The ECF should be shut-down for exactly the same reasons the Idaho Chemical Processing Plant (CPP-603) Underwater Fuel Storage Facility was shut-down - it was an unacceptable hazard and did not meet current standards. ECF has been leaking significantly >62,500 gallons of radioactive water over the past decade and the soil contamination around and underneath the basins must be included in the CERCLA cleanup process. [49] The Plan offers no soil sampling data to substantiate exclusion of the ECF from CERCLA action.

The Plan's exclusion of the Sewage Lagoon (NRF-23) from its so called "comprehensive" CERCLA cleanup, again, demonstrates the incompleteness of the Plan. Contaminate levels of arsenic, mercury, and cesium-137 would normally require remedial action. In fact, the Track 1 investigations recommended inclusion of the lagoons into the comprehensive RI/FS primarily due to radionuclides and the risk assessment results showed increased cancer rate of 1 in 10,000 from exposure to the site. [50] The Plan offers no data to substantiate the "risk management decision" to exclude the lagoons. NRF intends to continue to use these unlined leach pits despite the fact that every gallon of waste water that flows into the pit, leaches more contaminates toward the aquifer below. NRF should be required to close the Sewage Lagoons, remove all contaminated soil, and build new lined ponds that meet current regulations.

The Plan offers inaccurate data to support the preferred alternative. The Plan states that the maximum soil concentration at all of the 8-08 Operable Units for cesium-137 is 7,323 pCi/g. [51]Appendix H of the RI/FS however credits the S1W Leach Pit with a maximum detected cesium-137 concentration of 149,759 pCi/g. [52]This contaminate concentration discrepancy is significant because the undisclosed higher amount qualifies under NRC radioactive waste classification criteria in 10 CFR ss 61.55 and the "technical requirements for land disposal facilities" in 10 CFR ss 61.50. The preferred alternative does not meet NRC requirements. Actually, DOE's preferred alternative does not even meet municipal garbage landfill requirements under Resource Conservation Recovery Act (RCRA) Subtitle D which require

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[48] Final NRF Comprehensive Feasibility Study Report Waste Area group 8 Naval Reactors Facility, Idaho Falls Idaho, Pittsburgh Naval Reactors Office, Appendix H, pg. H8-8).

[49] Final NRF Comprehensive Feasibility Study Report Waste Area group 8 Naval Reactors Facility, Idaho Falls Idaho, Pittsburgh Naval Reactors Office, Pg. 5-1.

[50] NRF Plan@25

[51] NRF Plan@14

[52] NRF RI/FS@H4-22

liner, leachate monitoring wells, impermeable cap, and location restrictions over sole source aquifers. The NRF Plan contains none of these essential features. This Plan effectively shifts the risks, hazards, and ultimate cleanup costs to future generations. The high levels of hazardous materials in the NRF waste qualify it as a mixed hazardous and radioactive waste under the 1992 Federal Facility Compliance and RCRA Land Disposal Restrictions. Hazardous contaminates in the soil include chromium at 2,090 mg/kg and lead at 1,140 mg/kg when the EPA maximum concentration level (MCL) for both is 50. Also, mercury at 56.1 exceeds the MCL at 2 mg/kg. Under the circumstances, it is difficult to see how the Plan's preferred alternative can claim to meet all the "Applicable or Relevant and Appropriate Requirements" (ARAR).

1971 sampling data buried in the Administrative Record show long-term waste mismanagement at the S1W Leach Pit with cesium-137 at 310,000 pCi/g, cesium-134 at 42,00 pCi/g, hafnium-181 at 20,000 pCi/g, and cobalt-60 at 1,300,000 pCi/g. [53] Algae (accessible to ducks using the pond) sampling show 667,447 pCi/g. [54] By comparison, the risk based soil concentration for cesium-137 applied to this Plan is 16.7 pCi/g. These high contamination levels were due primarily to once through reactor cooling water dumped in the leach pits which was discontinued by 1980. No explanation is offered why the remediation goal applied to Waste Area Group 3 of 0.02 pCi/g for cesium-137 was changed.

NRF and DOE representatives stated at a public meeting in Moscow that the groundwater and aquifer are not at risk because contaminates are absorbed by the soil column. Review of the historical deep well sampling data at NRF does not support the Navy's conclusion. The NRF October 1995 Remedial Investigation / Feasibility Study (RI/FS) Appendix K shows Table III Deep Well Sample Results for Wells # 1, # 2, and # 3 at 60, 69, and 44 pico curies per liter respectively for gross beta. The federal drinking water standard for gross beta is 8 pico curies per liter. This deep well sample data confirm the contaminates do migrate, contrary to the Navy's claims.

The Cleanup Plan's "remediation goals" that set risk-based soil concentrations for contaminates of concern (cleanup goals) fail to include inhalation as an exposure pathway. This exclusion represents a major flaw in the Plan. Inhalation is the most biologically hazardous for alpha emitting contaminates of concern listed as americium-241, neptunium-237, plutonium-238, plutonium-244, and uranium-235, yet inhalation is not considered for these isotopes, nor for lead. The wide difference between ingestion of beta/gamma contaminated soil also appears out of balance. For instance cleanup goals for cesium-137 external exposure is set at 16.7 pico-curies per gram (pCi/g) while ingestion of soil is set at 24,860 pCi/g. Additionally, the beta emitter strontium-90 is not considered for external or inhalation exposure but is considered for soil ingestion at 15,416 pCi/g and food crop ingestion at 45 pCi/g.

An integral factor in the Cleanup Plan's establishing a "remediation goal" is the maximum concentration of contaminates of concern. The Plan acknowledges (pg. 14) that the

[53] NRF Remedial Investigation/ Feasibility Study (RI/FS@I-59).
[54] RI/FS@ pg. H6-13

maximum cesium-137 soil contamination detected at the NRF is 7,323 pCi/g which generated a risk based cleanup goal of 16.7 pCi/g. Again, this must be recalculated using the above cited maximum detected cesium-137 at 149,759 pCi/g "decay corrected to obtain equivalent 1995 results." This significant discrepancy begs the question as to the quality of regulatory review the State and EPA are bringing to the process and whether the "remediation goals" are supportable.

The Navy likes to characterize its operations as a responsible employer and steward of the environment, but the above discussion of NRF's unwillingness to meet even these lax cleanup standards should dispel any such illusion. Before Idaho allows any expansion of NRF, the Navy must first clean up the mess (including its buried waste) it has already made. The very bottom line is that the Navy must not be allowed to dump any more of its radioactive waste over our sole source aquifer. EDI supports former Governors Andrus and Batt in their challenge to DOE's new shipments of SNF to INL before they follow through with previous Consent Order stipulations to move the high-level and TRU waste out of Idaho. We simply cannot compromise future generations of Idahoans access to the water they will need to survive especially in this era of climate change.

Idaho Senator Kempthorne statement to Congress said: "No more quick fixes. That's what got us in this fix we are in today. The navy is not the villain and it may in fact be the innocent victim of the federal government's nuclear waste non-policy. The Navy can no longer give its waste to the Department of Energy, and say, 'We've done our job, and we have a great record,' while the Navy's waste sits in one facility plagued by corroding containers in unlined pools sitting above one of nation's largest underground aquifers. Even the contractor believes these pools should be shut down." [55]

Attachments: (available separately)

1. Figure 3.4-4: Surface Water Features, Wetlands, and Flood Hazard Areas at INL, DEIS/EIS-0453-D Recapitalization of Infrastructure Supporting Naval Spent Nuclear Fuel, Pg. 3-38 showing Big Lost River Flood Zone, Source: DOE/EIS-0373D.
2. Explanation of Significant Differences Between Models Used to Access Groundwater Impacts for Disposal of Greater-Than-Class-C-Like Waste Environmental Assessment for the INL Remote-Handled Low-Level Waste Disposal Project, INL/EXT-10-19168, Table 2, page 7. "The total waste volume is 11,700 cubic meters and contains a total of 159

[55] Opening Statement, Senator Dirk Kemthorne, July 28, 1993, Subcommittee on Nuclear Deterrence, Arms Control and Defense Intelligence, pages 3 and 4.

mega-curies [159 million curies] of radioactivity mainly from decommissioning of commercial nuclear power reactors currently in operation."

3. Table 5. Summary of Naval Reactors Facility best-estimate radionuclide inventories in waste sent to the Subsurface Disposal Area from 1953 through 1999. When added the total curie content is 952,986.86. "Supplement to Evaluation of Naval Reactors Facility Radioactive Waste Disposed of at the Radioactive Waste Management Complex from 1953 to 1999", J. Giles.etal., April 2005, ICP/EXT-05-00833, pg. 18.
4. Radioactive Waste Management (RWMC) Subsurface Disposal Area (SDA) (WAG-7) has been Divided into 14 Operable Units (OUs) color diagram Drawing No. Z920576, showing TRU Contaminated pits and trenches, and Non-TRU contaminated pits and trenches, Soil Vaults, TSA Releases, SDA Acid Pit.
5. RWMC SDA, Figure 2-4 Location of Acid Pit at the SDS, Plot Plan showing the number of pits, trenches, and soil vaults (EG&G-WM-9638) October 1991, pg. 2-24.
6. Radioactive Waste Management Information Data Base Solid Master Data Base (P61SH090), List for 1954 to 1970, Run Date 3/29/89, pages 517, 518, 519 and 520 (RWMIS).
7. Figure 3.4-6: Water Table Contour Map with Direction of Groundwater Flow for NRF, DEIS/EIS-0453-D Recapitalization of Infrastructure Supporting Naval Spent Nuclear Fuel, Pg. 3-42 showing NRF extrapolated contour lines in feet above mean sea level, Source BMPC2012.

References:

1. Final Comprehensive Remedial Investigation/Feasibility Study for the Naval Reactor Facility, Idaho National Engineering and Environmental Laboratory, Waste Area Group 8, October 1995, U.S. Department of Energy. Referred to here as NRF-RI/FS.

2. Nuclear Regulatory Commission 10 Code of Federal Regulation ss 61 Subpart D.

3. Environmental Protection Agency, 40 Code of Federal Regulations ss 261

4. United States Nuclear Waste Technical Review Board, Summer Meeting, 6/29/2010. States; Navy Spent Nuclear Fuel generated 65 metric tons, current inventory SNF is 25 MT, pg. 103 &104. The difference is apparently due to reprocessing.

5. The Final Environmental Assessment and Finding of No Significant Impact prepared in accordance with the National Environmental Policy Act, herein after referred to as EA-1793, is available at: http://www.id.energy.gov/insideNEID/PDF/Final EA DOE_EA-1793 2011-12-20.pdf