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Comments of the Institute for Energy and Environmental Research on the Department of Energy's Notice of Intent to Prepare a Supplement to the Stockpile Stewardship and Management Programmatic Environmental Impact Statement -- Complex 2030

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These are comments on the proposed scope of the various alternatives proposed by the National Nuclear Security Administration for the nuclear weapons complex as published in its *Notice of Intent To Prepare a Supplement to the Stockpile Stewardship and Management Programmatic Environmental Impact Statement--Complex 2030,* October 19, 2006.[1]

These comments are in addition to or an elaboration of the ones I made orally during DOE's hearing on the NOI in Washington, D.C., on December 14, 2006.

1. The Supplemental Programmatic EIS (SPEIS) must include the environmental impacts of a resumption of nuclear weapons testing

An SPEIS that excludes the environmental impacts of testing will be fundamentally incomplete and will not be in compliance with the requirements of NEPA. This is because there is a reasonable likelihood that nuclear weapons that incorporate new pit designs will have to be tested before they can be certified as safe and reliable components of the U.S. nuclear arsenal.

[1] United States. Department of Energy, National Nuclear Security Administration, "Notice of Intent To Prepare a Supplement to the Stockpile Stewardship and Management Programmatic Environmental Impact Statement—Complex 2030," *Federal Register* **71**, no. 202 (October 19, 2006), pages 61731 to 61736

IEER recognizes that the goal of the Stockpile Stewardship Program has been to certify "the safety and reliability of nuclear weapons without underground testing."[2] However, the introduction of newly designed pits, rather than the use of existing pits that have already been certified after the testing of existing weapons, clearly raises the possibility that one or more types of nuclear warheads incorporating these new pit designs will need to be tested before they can be certified for the U.S. nuclear arsenal.

The possibility of testing has arisen already within official circles in the form of a refusal to make commitments on testing. According an article the *New York Times*, a hybrid pit is being considered for the "Reliable Replacement Warhead" (RRW). Even absent any of the detailed considerations discussed below, this course could very well result in nuclear testing, despite statements to the contrary from the DOE. According to the article:

> But the [Nuclear Weapons Council's] decision to seek a hybrid design, combining well-tested elements from an older design with new safety and security elements from a more novel approach, could delay the weapon's production. It also raises the question of whether the United States will ultimately be forced to end its moratorium on underground nuclear testing to make sure the new design works.
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> On Friday, Bryan Wilkes, a spokesman for the National Nuclear Security Administration of the Energy Department, said the government would not proceed with the Reliable Replacement Warhead "if it is determined that testing is needed." But other officials in the administration, including Robert Joseph, the under secretary of state for arms control and international security, have said that the White House should make no commitment on testing.[3]

Hence, even before a single spadeful of dirt has been turned to build Complex 2030, government officials in positions of authority are not in accord. Moreover, once the facilities are built, there is no guarantee that the specific uses to which they will be put in 2030 or 2040 or 2050 are those that are envisioned today in terms of the types of pits that will be manufactured or the design goals that those weapons must meet. Meeting the requirements of the Department of Defense (DOD) and national security decision-makers is the stated goal of the Complex 2030 program. Present-day assurances by DOE officials that are not even fully backed up by other present-day administration officials cannot form the basis for the DOE to fulfill its NEPA requirements. Finally, those assurances are not unequivocal; nor can they reasonably be. The Reliable Replacement Warhead program may be initiated with the intent that the warhead would not require testing, but that intent will likely fall by the wayside if, for instance, the directors of the national laboratories or DOD decision-makers decide after the initial pits are built that testing is needed for safety and or reliability.

Testing is one reasonable and potential foreseeable consequence of embarking on new pit designs. The environmental impact of resuming nuclear weapons testing at the Nevada Test Site must form an essential part of any alternative that includes pit manufacturing facilities – whether

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[2] ibid.

[3] William J. Broad, David E. Sanger and Thom Shanker, "U.S. Selecting Hybrid Design for Warheads," *The New York Times*, 7 January 2007.

at the new pit facility or the enhanced manufacturing facility at Los Alamos National Laboratory or both.

The impacts of underground testing should take cognizance of the research that has been done at the test site that indicates that plutonium in colloidal form may travel much faster than believed when testing was being carried out.[4] Examining impacts of something does not require that it be certain that it will occur. The examination of the impacts of testing at NTS must be done for the same reason that the impacts of accidents that can be reasonably regarded as possible, even though unlikely, is necessary as part of the NEPA process. In this case, the likelihood of testing is far greater than that of many accidents that DOE has postulated and examined in the EIS's that form the antecedents to the proposed Complex 2030 SPEIS.

Testing is made more likely by the recent poor record of the DOE in its performance on major technical projects. The National Ignition Facility is a prime example of technical problems that could have been prevented with more prudent approaches. Yucca Mountain is a prime example, with many technical problems and changes in design, flawed data, cost overruns, and huge delays. The failure of pre-treatment of high level waste in the Defense Waste Treatment Facility after 16 years of effort, warnings of problems ahead from the inside and outside, and the ignoring of those warnings provides another example. The in-tank precipitation process was written off in the late 1990s, after 16 years and $500 million dollars of effort, almost a decade after it was supposed to have been operational. There is still no operating alternative in place.

There is a rather significant catalog of failures and major technical problems in large projects that are all part of a rather dismal record of management of large projects by the DOE. Table 1 summarizes some cost overruns that show the economic aspect of DOE's management failures in major projects.

[4] A. B. Kersting**,** D. W. Efurd, D. L. Finnegan, D. J. Rokop, D. K. Smith, and J. L. Thompson, "Migration of plutonium in groundwater at the Nevada Test Site," *Nature* **397**, 56-59 (1999)

Table 1: Cost data in some major DOE projects

Project	Early Estimate	Later Estimate
Superconducting Super-collider	$5.3 billion (1987)	$8.25 billion (1991)
National Ignition Facility	$1.074 billion (FY1996)	$1.196 billion (FY1998) $2.12 billion (June 2000)
	$0.8331 billion (FY1998)	$1.137 billion (June 2000)
	Total $2.03 billion (FY1998)	Total $3.26 billion (June 2000)
Savannah River Site Defense Waste Processing Facility	$1.2 billion (1987)	$2.1 billion (1992)
		$1.8 billion (1992) cost of supporting facilities in addition to the above $2.1 billion
Hanford Tank Waste Project (Phase I)	$4.3 billion (before September 1996)	$8.9 billion (August 1998)
All High-Level Waste Management Programs	$63 billion (1996)	$105 billion (2003)
Fernald Vitrification Project	$14.1 million (February 1994)	$20.6 million (December 1994) $56 million (July 1996) $66 million (September 1996)
Yucca Mountain	$17.5 billion (30 year cost estimated in 1990 adjusted to year 2000 dollars)	$58 billion (100 year cost estimated in 2000) DOE contractors said cost was understated by $3 billion since repository would not likely open in 2010 as claimed

Sources: GAO/RCED-93-87 p. 2, GAO/RCED-97-63 p. 5, GAO/T-RCED-99-21 p. 2-4, GAO-02-191 p. 19, GAO/T-RCED-93-58 p. 8, GAO-03-593 p. 17, GAO/RCED-92-183 p. 3, and Rowberg 2001[5] p. CRS-3 and CRS-5

Design and manufacturing of a new pit that would be the key component of a warhead that could be certified without testing would be an enormous challenge under any circumstances. Under the management of the DOE as it has operated for the last two decades, the likelihood of testing and the environmental harm that it would cause is considerably greater. Management problems and unforeseen problems in design or new design requirements arising out of new functions of nuclear weapons in DOD's planning or any combination of these factors could lead to a lack of confidence in the reliability of new pits without testing.

In sum, compliance with NEPA requires that DOE include the environmental impacts of nuclear testing of new pit designs in its SPEIS.

[5] Richard Rowberg, "The National Ignition Facility: Management, Technical, and Other Issues", CRS report for Congress, Order code RL30540, Congressional Research Service, Updated November 8, 2001.

2. One of the alternatives in the SPEIS should exclude any role for Los Alamos National Laboratory in Complex 2030.

It is essential that at least one alternative examine a configuration for accomplishment of Complex 2030 goals without inclusion of Los Alamos National Laboratory (LANL). LANL has had repeated major security problems and scandals that are not yet at an end. The Director of NNSA was recently relieved of his responsibilities, apparently at least partly due to these security problems. These seem to go back to the very founding of the laboratory during World War II, when scientists resisted becoming part of the military and a military culture, even though they were making atom bombs in the most secret project in World War II. It was so secret that even many commanding generals, like General Douglas MacArthur, did not know about it until almost the end of that war.

Los Alamos also has some unique vulnerabilities, being located in a heavily forested area in a very dry climate. A major fire in the year 2000 (the Cerro Grande fire) almost reached major plutonium operational areas and was just across the street from a major waste storage area. Los Alamos was found by a federal court in 1996 to be in violation of the Clean Air Act.

LANL has polluted onsite and offsite water as can be seen in Table 2 for canyon storm water.

Table 2: Data from the Draft LANL SWEIS showing some storm water data for canyons

	Onsite Canyons, pCi/liter	Mortandad Canyon, pCi/liter	Drinking water standard, pCi/liter, alone	Drinking water standard, all 3 present equally
Americium-241	15	40	15	5
Plutonium-238	15	50	15	5
Plutonium-239/240	10	30	15	5

Values estimated from graphs in the 2006 Draft SWEIS, Appendix F, Figures F-13, F15, and F-16; Standard from 40 CFR 141.66 2005. SWEIS = Site Wide EIS for LANL.

Table 3 shows pollution of groundwater at LANL.

Table 3: Groundwater contamination, picocuries/liter, 2001-2004

	Canyon alluvial groundwater systems	Other springs	San Ildefonso Pueblo	Drinking Water standard
Americium-241	0.5	0.03	0.02	15
Plutonium-238	0.6	0.015	2.0	15
Plutonium-239/240	0.25	0.015	0.01	15
Strontium-90	20	50	0.2	8

Values estimated from graphs in the 2006 Draft SWEIS, Appendix F, Figures F-1, F-3, F-4, and F-5; Standard from 40 CFR 141.66 2005.

While the samples were not of drinking water, the standards for drinking water are a reasonable benchmark for examining contamination (and LANL and other institutions also use them in that way). Given the scarcity of water resources in the region and the emerging possibility of greater scarcity due to droughts, the possibility that LANL will not be regarded as a good neighbor to the people of Northern New Mexico is a non-trivial one.

The consequences of some accidents at LANL are also huge. In its Draft EIS on the Chemistry and Metallurgy Research Building Replacement Project (DOE/EIS-0350D), the DOE estimated that a facility wide spill of 12,000 grams of plutonium would result in a population dose of about 167,000 person-rem. This is one indication that LANL is not a suitable location for large scale use or storage of plutonium. The dose consequences of fires are also large, though not estimated to be as severe as a facility wide spill. However, we note that that EIS did not take into account the potential consequences of a fire on the scale of the Cerro Grande fire.

A large part of the problem lies in the fact that LANL facilities do not have a significant separation or distance from public facilities including residential housing, compared to several other DOE sites. A comparison of the health impacts of plutonium-related accidents, including those discussed by the DOE for the CMRR, with similar operations on large sites, can only be properly done if LANL is omitted completely from one of the options for Complex 2030.

One of the most important problems at LANL has been its poor plutonium accounting as it relates to waste. There are two sets of books on plutonium accounts. One of these, the NMMSS, the master nuclear materials account, is at variance with the waste account, notably that compiled by LANL for the EPA as part of its program to send transuranic wastes to the Waste Isolation Pilot Plant (WIPP) for deep geologic disposal. A study by IEER has shown that the NMMSS account and WIPP account for plutonium in waste cannot both be right at the same time (though they may both be wrong). The discrepancy amounts to about 300 kilograms. There are potentially serious environmental implications if the amount in waste is greater than now believed by 300 kilograms. There are potentially serious security implications if the NMMSS account is short by 300 kilograms.

Repeated attempts to get the DOE and the NNSA, as well as the EPA, to seriously investigate this problem, which amounts to 60 bombs worth of plutonium, have failed. IEER has received

assurances from NNSA that the NMMSS account is correct. We have also received assurances from the EPA that the WIPP account is correct. These statements cannot both be correct – it is arithmetically impossible. The analysis of this assertion is to be found in IEER's report, *Dangerous Discrepancies*, which is at http://www.ieer.org/reports/lanl/weaponspureport.pdf. Correspondence with the EPA, the DOE, including the NNSA, can also be found on IEER's website at http://www.ieer.org/latest/pudiscrepanciesindex.html.

The IEER report, *Dangerous Discrepancies*, should be considered an integral part of these comments on scoping of the SPEIS. The failure of LANL to respond with alacrity substantively, with a detailed investigation, to such a huge plutonium discrepancy (about six times the size of North Korea's estimated plutonium stock) shows a continuing and standing disregard of one of the most important security issues in the nuclear weapons complex. LANL not only failed to keep proper accounts of plutonium in waste, but it has also failed for a long time to correct the accounts, when they are clearly incompatible.

The SPEIS cannot be regarded as having examined reasonable alternatives unless at least one of them excludes LANL completely.

3. Need for the project

Recent research has shown that existing pits have lifetimes in excess of 85 years. There is no need therefore for either the enhanced pit production capability at LANL or the new modern pit facility that is proposed. The SPEIS should therefore consider an alternative that does not have either the LANL pit manufacturing or a modern pit facility.

4. Global environmental and security impact

The SPEIS should consider the global environmental impact of the various alternatives it examines. New pit designs carry the risk of a resumption of U.S. nuclear testing, as noted above. That in turn is likely to result in a resumption of testing by one or more of the other nuclear weapon states, such as Russia or China. Note that China has not ratified the CTBT and is unlikely to do so unless the United States does it first. The direct and indirect environmental impacts on the United States of foreign resumption of testing should be examined.

There is no assurance that foreign resumption of testing would be underground, or, if it is underground, that it would not vent large amounts of radioactivity. Hence, the possibility that new pit designs would eventually lead to a complete breakdown of environmental norms cannot be ignored, even though this may now be regarded as unlikely.

The Nuclear Nonproliferation Treaty (NPT) is also likely to be rapidly eroded if the United States resumes nuclear testing. The proliferation and security consequences of such an outcome are very likely to be extremely serious. In particular, the likelihood that nuclear weapons would be used again in war, which has not occurred since 1945, would be considerably increased. Even more likely, nuclear proliferation would likely increase the chances of non-nuclear conflict. Actual and perceived proliferation has already resulted in serious conflict with terrible environmental consequences in Iraq and the entire Persian Gulf region. The tense international

environment around proliferation also threatens further conflict. The SPEIS should examine the environmental consequences of non-nuclear conflict and of the use of a few nuclear weapons in military conflicts should the U.S. resume nuclear testing. Such an outcome is not more unlikely than some of the accident scenarios considered routinely in EIS's and therefore falls squarely within the scope of environmental considerations that DOE is obliged to take into account under NEPA.

In view of the environmental risks posed by pursuing Complex 2030, the SPEIS should examine an alternative where only safe storage of existing weapons and materials and enhanced safe dismantlement capacity are maintained in the industrial infrastructure of the U.S. nuclear weapons complex. The DOE may not adopt this option in view of the demands upon it by the DOD or other parts of the executive branch that would make decisions about the U.S. nuclear arsenal. Yet an alternative that excludes new production should be included as part of the NEPA process, if only because it makes clearer the environmental consequences of the course the government seems intent on pursuing. NEPA would seem to require that.

5. Use of BEIR VII in Risk Estimates

DOE should use the risk estimates of cancer incidence published in the BEIR VII report[6] for its cancer estimates since the report provides the most recent scientific assessment by the National Research Council. The estimates of both incidence and fatalities should be provided.

6. Risk assessment methodology

DOE uses a common risk assessment methodology whereby the probability of an accident is multiplied by the consequences. This is a useful technique if the probabilities are based on empirical evidence or sound theoretical considerations buttressed by supporting data. The SPEIS should include the basis for its estimates of the probabilities of accidents so that the public can comment upon the reasonableness of the estimates.

Further, for severe accident consequences, such as those associated with large fires involving plutonium or a facility wide plutonium spill, a part of the risk analysis between alternatives should be a comparison of the consequences alone, given that the event occurs.

7. Elements that should be included in the SPEIS

The scope of the SPEIS should include

- An estimate of the consequences to the present national nuclear posture in case of a severe event such as a facility wide plutonium spill for each alternative. This assessment should include an evaluation of whether the entire site would have to be abandoned or closed for an extended period, or whether parts of the operation could be continued in some locations but not in others.

[6] National Research Council, Board on Radiation Effects Research (BRER), *Health Risks from Exposure to Low Levels of Ionizing Radiation: BEIR VII Phase 2*. Washington, D.C.: The National Academies Press, 2006

- An estimate of the consequences to the economy and society of New Mexico in case of a severe event for all alternatives including LANL.
- Extend the accident analysis radius to include impacts on Albuquerque for all alternatives including LANL.
- Perform a detailed analysis of the consequences of severe plutonium releases on the nearby pueblos for all options including LANL.
- Perform a detailed analysis of the consequences of severe plutonium releases on the Rio Grande, on the economy and society of nearby communities, of New Mexico, and of states near New Mexico for all alternatives including LANL.
- Conduct an analysis of whether a major deposition of plutonium in the Rio Grande Basin might affect U.S.-Mexico relations for all options including LANL or any other site in proximity to the Rio Grande.
- Provide an environmental justice analysis in case pueblos have to be abandoned for all options including LANL.