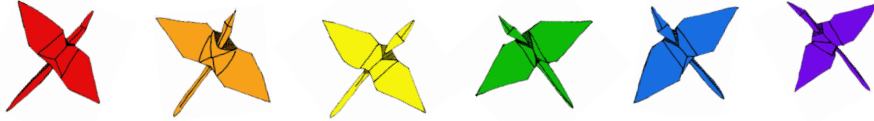


Oak Ridge Environmental Peace Alliance

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Mr. Brian Costner, Director
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U S Department of Energy
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Ms. Terri Slack
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Oak Ridge, TN 37831

14 August 2020

Dear Secretary Brouillette, Administrator Gordon-Hagerty, Mr. Costner, Mr. Diamond, and Ms. Slack:

The Oak Ridge Environmental Peace Alliance, Nuclear Watch New Mexico, and Dr. David Jackson submit for the record these comments outlining our continuing concerns about deficiencies in the *Final Supplement Analysis for the Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex, Earthquake Analysis (DOE/EIS-0387-SA-04)*. These include numerous instances where NNSA has failed to adequately respond to concerns raised in our comments on the Draft SA. We call your attention to these continuing concerns while you still have time to reconsider your decision to forgo the preparation of a Supplemental SWEIS or a new SWEIS for the Y-12 National Security Complex.

Thank you for your attention to our concerns.

Sincerely,

Ralph Hutchison, coordinator
Oak Ridge Environmental Peace Alliance



Comments of the Oak Ridge Environmental Peace Alliance and Nuclear Watch New Mexico
on the National Nuclear Security Administration's *Final Supplement Analysis*
for the *Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex, Earthquake*
Analysis (DOE/EIS-0387-SA-04)

The Oak Ridge Environmental Peace Alliance submits for the record this response to the Final Supplement Analysis for the *Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex, Earthquake Analysis* (DOE/EIS-0387-SA-04). The purpose in submitting these comments is to establish for the record the continuing deficiencies in the Final SA and our objections to them. After a careful review of the National Nuclear Security Administration's Final SA, we reinstate the concerns expressed in our comments on the Draft SA. We are joined in these comments by our colleagues at Nuclear Watch New Mexico.

A detailed review of NNSA's earthquake analysis is technically beyond the capacity of the Oak Ridge Environmental Peace Alliance and Nuclear Watch New Mexico. For that, we contracted with Dr. David Jackson, Distinguished Professor Emeritus at the University of California Los Angeles, and past president of the Seismology Section of the American Geophysical Union and Science Director of the Southern California Earthquake Center. Dr. Jackson submitted comments on the Draft SA. OREPA asked Dr. Jackson to evaluate the response to his comments in the Final SA. Dr. Jackson found:

"NNSA has failed to address serious environmental risk issues that I have raised twice in response to the 2018 Draft Site-Wide Analysis. These issues include:

- reliance on one arbitrary intensity measure, PGA, for earthquake damage potential, neglecting shaking duration and many others;
- arbitrary choice of 2% in 50 years (same criterion used for a single fire station) to represent the risk tolerance for a large nuclear facility;
- demonstrably false assumptions that large earthquakes can only occur on pre-recognized "capable faults;"
- neglect of many secondary effects of earthquakes that could cause damage to the Y-12 facility itself and limit the functional support in the surrounding region needed for earthquake response.

Furthermore, NNSA continues to rely on promised future engineering and seismological studies as if they were completed and their conclusions were known and validated."

Dr. Jackson's full comments are appended.

In our May 25, 2020 comments on the Draft SA, OREPA noted that NNSA minimized consideration of the site-wide environmental impacts of an earthquake at the Y-12 site by limiting its consideration to NNSA's "hybrid plan" for enriched uranium operations at the Y-12 National Security Complex and ignoring all other operations at Y-12, many of which have the potential for significant environmental consequences and would invariably impact the possible environmental consequences of releases from the EU operations facilities. In other words, the impacts of an earthquake in Bear Creek Valley cannot be cordoned off and considered in discrete pieces.

For the record, OREPA reiterates:

NNSA has failed to prepare an SA evaluating, at a minimum, the site-wide environmental consequences of an earthquake at Y-12. Instead, NNSA has chosen to:

- limit its consideration of impacts to the Uranium Processing Facility and Extended Life Program facilities (the 9215 Complex and the 9204-2E facilities), thereby ignoring the complications, consequences and

impacts associated with other Y-12 facilities that would be also be part of any credible earthquake event; it has been more than twenty years since a true “site-wide” analysis of the environmental impacts of Y-12 operations and activities has been undertaken;

- ignore completely the possible consequences from an earthquake event in the next five years, prior to occupancy of the UPF, despite the requirement that ongoing activities be considered in an environmental analysis;
- limit its assessment of environmental impacts to radioactive contaminants, thereby ignoring the impacts of scores of other hazardous, toxic and dangerous materials, chemicals, and compounds;
- prepare an SA that falls short of a rigorous seismic hazard evaluation associated with its activities at the Y-12 National Security Complex; and
- limit its analysis of consequences to human exposures to radioactive contaminants, thereby ignoring impacts to the larger environment of the full range of contaminants likely to be released in an earthquake event, including but not limited to beryllium, mercury, lithium, anhydrous hydrogen fluoride, helium, and other industrial materials.

We also note that throughout the Final SA, NNSA relies on old studies, many of which predate the 2014 US Geological Survey hazard assessments, even as it acknowledges the limitations of those studies and the necessity of further study. The fact that NNSA is unable to answer fundamental questions about the performance of the buildings at Y-12 without further study, as attested to even on the signature page of the Final SA, is a clear indication of the need for a Supplemental SWEIS or a new SWEIS—with up-to-date information (the Final SA indicated, on page 10, that it relies on 2003 assessments for some of its data on the Extended Life Program buildings). A promise to do adequate studies in the future fulfills neither the requirements of the court nor the expectations of NEPA.

With few exceptions, NNSA declined to make substantive changes to the 2020 Draft SA in response to the comments submitted by OREPA, including those of Dr. David Jackson, submitted as an attachment to our comments. In fact, no responses whatsoever to Dr. Jackson’s comments are incorporated in the Final SA; they are all dismissed with attempts to explain them away in Appendix C.

Appendix C consolidates comments from 142 “comment documents” into 38 subjects and provides responses. For easy reference, OREPA’s comments will adopt the numbering NNSA used to consolidate comments in the Final SA.

Comment 5.

In its response to Comment 5, NNSA provides a gratuitous and misleading reference to the Nuclear Non-proliferation Treaty, saying “It should be noted that the Nuclear Nonproliferation Treaty, however, does not provide any specific date for achieving the ultimate goal of nuclear disarmament, nor does it require the elimination of the current stockpile of nuclear weapons.” This statement is narrowly true. However, it is also misleading. The NPT, signed by the United States in 1969, committed the United States and all nuclear weapons states to pursue negotiations in good faith leading to complete disarmament at an early date. (NPT, Article VI) Fifty years later, only one nuclear weapons state has disarmed (South Africa), and several former members of the Soviet Union have relinquished their nuclear weapons. The United States continues to maintain a nuclear stockpile of nearly 5,000 nuclear bombs and warheads, 1500 of which are actively deployed. This cannot by any stretch of a good faith imagination be construed as complying with the promise made in the NPT. And while it is true the NPT fixed no specific date for the achievement of complete disarmament, it cannot be credibly argued that parties to the treaty would have agreed that “at an early date” meant more than 50 years. But here we are.

Contradicting the NNSA’s self-serving assertion in the Final SA is the unanimous 1996 finding of the International Court of Justice (the World Court) that “there exists an obligation to achieve nuclear disarmament under strict and effective international control” on the part of nuclear weapons states. Further support for the assertion that “at an early date” was not meant to be construed as an open-ended permission to continue to maintain massive nuclear stockpiles for more than fifty years was the 2017 passage at the United

Nations, by 122 nations, of the Treaty on the Prohibition of Nuclear Weapons. The TPNW was intended to close the legal gap left open by the NPT and to formalize draw a clear and indelible line outlawing the manufacture, possession or use of nuclear weapons. During debate on the floor of the United Nations it was made clear that the TPNW is a direct expression by many nations of their frustration at the failure of the nuclear weapons states to fulfill their obligation under the NPT. As of August 11, 80 nations have signed the Treaty and 44 have ratified or acceded to it; six more accessions will result in the entry into force of the Treaty. Finally, in a 2013 hearing in federal court in Knoxville, Tennessee in 2013, former Attorney General Ramsey Clark, who was Attorney General at the time the Nonproliferation Treaty was signed, testified that the production of nuclear weapons components at Y-12 is, in his view, “unlawful” and in violation of the US commitment to disarm codified in the Nonproliferation Treaty. Pressed by the judge, Clark declared the NPT was the single most important treaty the US has ever signed. Under the Constitution, Clark testified, in answer to the judge’s question, “The Treaty is the supreme law of the land,” and “would prevail” if Congress passed a law that conflicted with it.

Comment 7.

The response to Comment 7 disavows the direct statement in the Draft SA, quoted in the comments, that the accident impacts for the Hybrid Alternative would be 10 times greater than the 2011 Y-12 SWEIS estimates. Final SA, Response to Comments (C-5): “Accident impacts (i.e. consequences) for the Hybrid Alternative would not be 10 times greater than the 2011 Y-12 SWEIS estimates.”

Compare this to the quote from the Draft SA: “The consequences of the worst-case design-basis accidents for the Hybrid Alternative are approximately ten times larger than the consequences for the Capability-sized UPF Alternative...”

The relevant comparisons in Table 3-12 are, as noted in the Draft SA, between the Capability-sized UPF (the Alternative chosen in the 2011 ROD) and the Hybrid Alternative (the current plan). In its response to comments, NNSA attempts to misdirect the reader by pointing to the consequences of the No Action alternative. (Admittedly, this was considered in the 2011 SWEIS. However, it was not the adopted Alternative, and is not relevant to the comparisons at issue here, where NNSA is tasked with determining if there is a significant difference between the new plan and the old plan, the standard which would trigger a Supplemental EIS.)

Technically, NNSA is correct—the consequences are not 10 times larger. They are closer to 12 times larger. From Table 3-12, Consequence Comparison...:

The Dose calculation, for both the Maximally Exposed Individual and for the Offsite population, is approximately 12 times greater for the Hybrid option, Scenario 2, when compared to the 2011 SWEIS Capability-sized UPF alternative.

Dose estimate for MEI:

Capability-sized UPF (2011 SWEIS):	0.0352 rem
Hybrid Alternative (2020 SA):	0.415 rem

Dose estimate for the offsite population:

2011 SWEIS, Cap-sized UPF:	29.6 rem
2020 SA Hybrid Alternative:	350.1 rem

For the non-involved worker, the difference in exposure is more than 20 times greater

2011 SWEIS, Cap-sized UPF:	0.104 rem
2020 SA Hybrid Alternative:	2.24 rem

Dose translates into consequences at about the same rate. For the offsite population, the latent cancer fatality expectation is calculated to be .018 for the Capability-sized UPF (2011 SWEIS) and 0.21 for the Hybrid Alternative (2020 SA). Again, 12 times greater.

The “ten times larger” phrase is scrubbed from the Final SA. The language substituted, while accurately

representing the data in the table, is now intentionally vague. The fact that a change was made in the language that translates the numbers in the chart into layperson's English in favor of less clarity and specificity indicates a conscious decision to obfuscate the difference between the two alternatives.

Comment 9.

The Final SA still fails to provide a clear explanation to the reader of the size of a design-basis earthquake. In the response to comments, NNSA says the earthquakes analyzed in the SA are "in the 6.0 magnitude range." The reader is also referred to a more technical but still imprecise description in the response to Comment 28. At some point in the modeling of building performance in an earthquake scenario, some actual numbers were plugged in—in all likelihood, the model was run several times with a range of numbers. These numbers may not exactly match up with a number on the Richter scale—the measurement scale familiar to the public—but there should be enough parallel points to allow an explanation to the public.

Public comments cited studies and analyses that suggest a magnitude 6.5 earthquake is reasonably predictable for the East Tennessee Seismic Zone. Given that the Richter scale is a logarithmic scale, the difference between 6.0 and 6.5 is considerable. A conservative model would exceed 6.5 in order to provide a margin for error. (On August 9, 2020, East Tennessee was impacted by a 5.1 magnitude earthquake centered in Western North Carolina, the largest earthquake in the region in more than 100 years.) In the case of the 9215 Complex and Building 9204-2E, the difference may not be as significant—neither of those structures would be expected to withstand an earthquake of significantly smaller magnitude than 6.0. But in calculating the performance of other structures, including roadways, bridges, water and chemical storage tanks, power lines, contaminated buildings and waste sites, it will make a difference both in the immediate damage done and the complications to subsequent efforts to address the damage, particularly in the short-term emergency response, but also in long-term remediation efforts.

The Final SA attempts to disavow the breadth of its parent document, the 2011 Site-Wide EIS, and narrow the focus of its attention to the UPF and EU operations buildings, even going so far as to assert that it was given permission to do so by the federal court in Knoxville. Nevertheless, the regulations of NEPA continue to apply to the Department of Energy and to NNSA. The Supplement Analysis remains inadequate in that it purports to be an analysis of a Site-Wide document, but it does not consider the site-wide impacts of an earthquake. Instead it analyzes an impossible hypothetical scenario, one in which a large earthquake apparently selectively impacts the EU operations buildings.

Even then, the Final SA fails to evaluate the consequences of an earthquake in the next five years, when EU operations will continue not only in the non-compliant 9215 Complex and Building 9204-2E, but also in the even more dangerous and unreliable Building 9212 and the various wings attached to it—which NNSA states will not be deactivated until 2035 at the earliest (C-22). NNSA attempts to skirt its responsibility by pointing out that it has a program to reduce risks by moving materials out of the buildings. What NNSA does not say is that unknown quantities of HEU in various states, containers and locations, including HEU suspended in ductwork throughout the 9212 Complex, continue to present risks that are not fully understood, let alone quantified and analyzed. Nor does NNSA track the risks that accompany the relocated MAR (material-at-risk) in its new location. The Defense Nuclear Facilities Safety Board has noted that the MAR effort has resulted in storage violations in the HEUMF, indicating that the MAR risk reduction program is, at least to some extent, a risk relocation program.

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In the response to comments, NNSA attempts to avoid detailed consideration of impacts on non-human life with a specious and irrational assertion that humans stand as a reasonable sentinel marker for all forms of life, quoting a "concept endorsed by the International Commission on Radiation Protection (ICRP) which states, 'if man is adequately protected then other living things are also likely to be sufficiently protected.'" This statement is incredible—not to be believed—as it stands in defiance of what we know about how radiation impacts living organisms.

Consider that most radiation standards used around the world to establish protective levels were determined using "Reference Man." Reference Man is a 40 year old, white male. No credible argument can be made that exposure to a quantified radiation source would be expected to have the same effect on an infant child that it

would have on a 40 year old male. When the Oak Ridge Health Agreement Steering Panel conducted a Dose Reconstruction study in the 1990's, it was determined that for one contaminant of concern, Iodine-131, the maximally impacted person would be a four year old female human who drank milk from a backyard cow that had grazed on grass with I-131 on it. (This was not farfetched, as the Atomic Energy Commission intentionally released quantities of highly radioactive Iodine-131 into the atmosphere and tracked it as far as 17 miles from Oak Ridge National Lab. The purpose of the experiments was to calibrate and evaluate radiation detection instruments in surveillance airplanes. The releases took place within five miles of Butter-milk Road in Roane County). Not only was the impact greater on a four year old than a forty year old, it was greater on a four year old female than on a four year old male. That's how radioactive materials work.

The type of radiation matters, as does the pathway to the exposed individual and possibly into the exposed individual. Uranium, for instance, poses little threat outside the body—as an alpha emitter, it does not penetrate the skin because alpha particles are relatively large (as compared to beta particles). But ingested or inhaled, uranium dust will do maximum damage at the cellular level for the same reason—because alpha particles are large.

Size matters. It is absurd and untrue to assert that as long as humans are unharmed, mosquito larvae, insects, fish or other wildlife are safe from the effects of radiation. With radiation as with many toxins, the effects are not distributed evenly among all population groups—the young, the old and the small are most vulnerable and disproportionately affected. Immuno-compromised people might also be adversely affected to an extent greater than otherwise healthy people. And, as we have seen with radioiodine, sometimes radiation even discriminates between genders.

In assessing the possible impacts of a Vanderbilt University study performed in the 1960s on unsuspecting pregnant women who availed themselves of the prenatal services of Meharry Medical Institute—600 women were told they were participating in a “nutritional study”; they were, in fact, being fed radioactive iron—one expert noted that the dose to the pregnant woman was likely inconsequential because the amount of radioactive iron was small. Even the dose to the fetus, he calculated, was likely to be nearly harmless. “But if that fetus was female,” noted the expert, “it would already be carrying its eggs. And those eggs would receive a proportionately massive dose of radiation.” The lesson was twofold—size matters; the same dose delivered to women at different stages of development would be expected to have different impacts. And the effects of the experiment would not be fully known for several generations. (In fact, as in most of the experiments conducted on non-consenting people under contracts granted by the Atomic Energy Commission, including mentally handicapped children in Boston, prisoners, the elderly, those considered terminally ill, and, in the very first case of a human being injected with plutonium, a Black truck driver who was admitted to the hospital in Oak Ridge with a broken leg who checked himself out a week later and returned home to North Carolina, long-term follow-up of subjects was not usually carried out. It was decades before the truck driver was tracked down.)

Comment 10.

In response to Comment 10, NNSA asserts that radioactive particles of highly enriched uranium, once dispersed into the air, will defy gravity and remain airborne rather than be deposited on surfaces. Prohibiting deposition, says the SA, maximizes the inhalation dose to humans. A better model would be one which conforms to the laws of nature—smaller, lighter airborne particles would travel in the air; larger, heavier particles would be deposited on surfaces, tracking with the direction of the plume. This becomes important when one considers the impacts of HEU released in an earthquake or other accident on non-human life forms. Given the extraordinary long half-life of HEU (it remains toxic for billions of years as it decays, and even then eventually becomes lead, itself a toxin), a model that tracks HEU throughout the environment is more appropriate than one that create an artificially constricted pathway for exposures. Given that Oak Ridge has one of the most sophisticated supercomputers on the planet, it should be possible to model real-world impacts under a variety of scenarios, wind directions, etc.

Comment 11.

In response to Comment 11, NNSA attempts to explain a statement made in the 2011 SWEIS in Section 3.2.5 describing the No Net Production/Capability-sized UPF: “NNSA would reduce the operational capac-

ity of facilities to no more than 10 secondaries and cases per year, which would support surveillance and dismantlement operations and a limited LEP workload; however, this alternative would not support adding replacement or increased numbers of secondaries and cases to the stockpile.”

This statement on its face seeks to have it two ways—surveillance and dismantlement operations can be supported with a throughput capacity of 10 secondaries and cases/year. “Surveillance and dismantlement operations” presumes replacement of secondaries and cases that were destroyed during surveillance operations; otherwise, there would be no need for secondary and case production at all. The critical point in 2011 was that a larger capacity UPF (80 secondaries/cases per year, or 8 times the required capacity) would permit production of new secondaries and cases to the stockpile. At that time, however, no new production was projected—in fact, in the intervening years, the stockpile numbers have decreased due to the requirements of the New START Treaty.

Now, in the Final SA, NNSA reports that its National Security requirements have changed; the new requirements are captured in the 2018 Nuclear Posture Review and the Fiscal Year 2020 Stockpile Stewardship and Management Plan. NNSA does not cite a legislative mandate for selecting an Alternative that would produce eight times as many secondaries and cases per year as its current authorized mission requires because no such legislative mandate exists. Unlike the Congressional requirement that NNSA demonstrate the capacity to produce 80 plutonium pits/year by 2030, NNSA’s justification for a UPF capacity of 80 secondaries and cases/year is justified only by circular reasoning: we have to do it because we have said we have to do it.

In any event, NNSA insists that what was optional in 2011 is now required in 2020; this represents a significant change and puts increased pressure on Oak Ridge’s Y-12 operations. How NNSA will meet this increased demand, and on what timetable, is worthy of analysis—for at least the next five years, NNSA will be limited to operations in facilities that fall far short of meeting environmental and safety regulations; beyond that, for another 15-25 years, HEU operations are projected to continue at the new level—not specified, but clearly indicated at something far above 10 secondaries/cases per year—in unsafe facilities.

Comment 12.

In light of the new mission requirements for Y-12, an updating of the 2011 SWEIS is in order. NNSA’s response to Comment 12 is totally inadequate. It fails completely to imagine the immediate and long-term aftermath of a devastating 6.7 earthquake located in Oliver Springs, Tennessee, on operations in Bear Creek Valley. It posits that disruptions will be less than total and that “there are multiple access points/means of reaching any facilities on site.” This is true; it is equally true that every one of them is likely to be compromised in the event of a major earthquake. NNSA states that “first responders are located at the Y-12 site,” but in fact, the number and capacity of the on-site response teams is limited. Y-12 has an agreement with the City of Oak Ridge for support in the event of on-site fires, and Oak Ridge emergency vehicles routinely enter Y-12 to provide support. It is highly unlikely that an adequate, full-scale first-responder crew would be on-site at Y-12 should an earthquake occur at, say, 3:00 in the morning on a Sunday morning.

Comment 14.

In the response to Comment 14, NNSA attempts to separate construction of the UPF from the broader Enriched Uranium program, thereby missing the point of the comment entirely. Since the EU program relies on all projected facilities operating in order to meet mission requirements, it is clearly not advisable to invest billions of dollars in construction of the UPF before NNSA has ascertained whether or not the other parts of its program (the 9215 Complex and Building 9204-2E) will actually be able to complete their parts of the EU program. It is the interdependence of these facilities that demands NNSA hit the pause button until it has sorted out the entire program and confirmed that the facilities will be able to function safely for two or three more decades. NNSA says its Extended Life Program is designed to do this, but the ELP is still gathering information. While NEPA does not have the power to compel NNSA to make the best decisions, it is designed to be that part of the decision-making process that clarifies what is at stake in each Alternative under consideration. In NEPA terms, the investment of billions of dollars in the limited capacity UPF places enormous pressure on NNSA to support the UPF by continuing EU operations in the non-compliant, unsafe facilities. It could even be argued that commencing construction of the UPF before the entire EU program is NEPA compliant illegally prejudices all other decisions about the EU program, including this SA.

Comment 16.

In response to Comment 16, NNSA explains its methodology for calculating dispersal of radioactive contaminants in the air. NNSA explains that it uses meteorological data from ten towers and runs models simulating the contaminant plume at every hour of the year (for a total of 8,760 weather trials). NNSA then says dose results are averaged throughout the entire year. This averaging sounds as though it would dilute the actual dose at any given moment (since an earthquake won't happen as an event averaged throughout the year), and that more meaningful numbers would be obtained by taking representative samples from a variety of dispersal patterns and listing the maximally exposed populations for each of the representative simulations.

Comment 22.

In response to Comment 22, NNSA writes: "Safety is NNSA's number one priority, and NNSA does not prioritize production over safety." This statement is untrue. NNSA's record of prioritizing production over safety is almost unbroken. NNSA failed to stop construction at the UPF during the COVID-19 pandemic despite state and local guidelines recommending gatherings be limited to less than 10 people and non-essential workers remain at home. (At least one Y-12 worker has died from the coronavirus; NNSA has not released numbers of workers who have become ill.) Reports from the DNFSB over the last year include dozens of incidents of criticality safety violations; a July 2019 letter pointed out that these significant safety concerns have been known and unaddressed for more than 10 years. NNSA's announcement that it would not renew the operating contract of Consolidated Nuclear Services when it expires next year cited these concerns. The bottom line—workers have been working in unsafe conditions. Why? Not to conduct cleanup operations, and not to reduce risks—they are working to meet production goals.

The prioritization of production over safety is also reflected in the ongoing failure of NNSA to fund cleanup operations—which are, in both the long and short run safety activities—while increasing budgets for production activities. A report from the Government Accountability Office in July 2020 states: "Proposed funding for EM [Environmental Management]'s program activities for fiscal year 2021 is \$6.2 billion, compared to the enacted budget for fiscal year 2020 of \$7.5 billion. This proposed funding includes a reduction of \$1.2 billion for the Defense Environmental Cleanup appropriations account. This reduction would serve as an offset to DOE's requested increase for the Weapons Activities appropriation account when considering the National Defense budget function. According to DOE EM officials, the decrease in EM's proposed funding for fiscal year 2021 reflected 'an allocation of available resources, given national defense priorities.'" NNSA's adamant assertion that production is not prioritized over safety, while understandable, is belied by DOE officials themselves.

Subjecting workers to safety risks in pursuit of production goals, often unnecessarily, is unconscionable. NNSA only makes it worse by denying it.

In responding to Comment 22, NNSA offers an interpretation of the clear and explicit language of the federal court order that has compelled the SA. Quoting the Court Order, NNSA chooses to emphasize the phrase "of earthquake consequences at the Y-12 site" by italicizing the words. But the other words in the court order also matter. NNSA is ordered by the court to conduct "further NEPA analysis—including at a minimum, a supplement analysis—that includes an unbounded analysis of earthquake consequences at the Y-12 site, performed using update seismic hazard analyses..." In this quote from the court order, the word "include" appears twice; each time an indication that the words following are a subset of something bigger. The words "include" are not meant to constrain NNSA—quite the opposite; they set down the minimum marker within the context of the larger requirements of NEPA.

NNSA reads the Court Order to say, "You have to prepare an unbounded analysis of an earthquake on your Enriched Uranium operations buildings." But the court does not say that. The court says NNSA has to prepare at a minimum a Supplement Analysis that includes an unbounded accident analysis of earthquake consequences *at the Y-12 site...*" This was the point of the comment—an SA of a Site-Wide EIS must be a site-wide SA; it must look at the impacts from an earthquake on the entirety of the Y-12 site. Not only is this the only way to satisfy NEPA, it is also the only way to fulfill the requirements of the court, and it is the only way to actually assess the impacts of an earthquake on the environment, workers and the public.

Comment 26.

In response to Comment 26, NNSA makes an amazing statement absolving itself of the need to address the release of soil contaminants in the event of an earthquake, saying "such an analysis would be beyond generally-accepted accident analysis methodology and would require undue speculation." While this may be true at some level, it is inadequate and fails to meet the minimum requirements of NEPA on at least two

levels. One: “Generally accepted accident analysis methodology” does not justify failure to consider a very real environmental impact. Y-12 is not a usual site—it is a heavily contaminated Superfund site. This is a burden created by NNSA and its predecessors, and it is in this context that any analysis of the environmental impacts of an earthquake must take place. If NNSA is required to conduct, at a minimum, an “unbounded accident analysis of earthquake consequences at the Y-12 site,” it does not get to pick and choose what parts of Y-12 it wants to look at; it has to look at the whole site. Two: the fact that the condition of some facilities and parcels at Y-12 introduce an element of uncertainty when considering earthquake impacts is not an argument for ignoring them; to the contrary, it calls attention for the need to develop data points (many of which already exist) to populate models that can “speculate” about the disruption and subsequent transport of contaminants by a large earthquake. After all, every model being used by NNSA to estimate doses, exposure, risks and consequences is a speculation, however sophisticated. NNSA does not get to avoid consideration of impacts here because it would require speculation and then turn around and declare with confidence that it knows enough about how the 9215 Complex and Building 9204-2E will perform in an earthquake despite to approve their continued use even while acknowledging deficiencies in basic information that will not be resolved until the end of next year.

Comment 27.

In the response to Comment 27, NNSA fails to respond to commenters concerns about anhydrous hydrogen fluoride containment failure in the event of an earthquake event. Y-12 has experienced at least one small AHF leak in its history; the consequences of that relatively minor event demonstrated that a large release would be devastating to workers, the environment, and potentially to off-site personnel.

Comment 28.

In responding to Comment 28, NNSA acknowledges, in a backhand way, the validity of the commenters concerns. By citing a “commitment to update the Y-12 site-specific PSHA,” NNSA is also acknowledging the inadequacy of its current state of knowledge about the seismic performance of the 9215 Complex and the 9204-2E buildings. Nevertheless, the Final SA purports to offer a degree of assurance to the public that NNSA can analyze the consequences of an earthquake with outdated and partial knowledge to a degree sufficient to meet the requirements of NEPA. We do not accept this assertion. The point of NEPA’s requirement that an analysis meet the “hard look” standard is not to permit an agency to kick the can down the road, but to compel an agency to gather the necessary information and perform sufficient analysis before it embarks on an irreversible course.

To say that studies are underway that will answer crucial questions is tantamount to confessing that an agency can not currently meet the standard expected by NEPA but is nevertheless committing irretrievable resources, even constructing a multi-billion dollar facility without knowing for sure if the EU plan will pass muster.

Comment 33.

In responding to Comment 33, NNSA repeats that it has confidence in the outcome of studies that have not yet been conducted. It does not quantify that confidence level, leaving the public in a state of ignorance and uncertainty about the level of risk to which we and the environment are being subjected. Clearly, the confidence level is not so high as to preclude the necessity of further study. In explaining its methodology, NNSA says it has conducted comparisons using historic and current hazard instruments and concluded that the results indicate “more formal review” is warranted. This can only mean the answer is unsettled. Assurances of confidence, then, about the results of the current and future studies are speculation, and hardly rise to meet, much less clear, that “hard look” standard NEPA demands.

In its explanation, NNSA outlines its main problem which is one of chronology. It wants to begin (and indeed, has already begun) implementing its decision before it has completed the required environmental analysis. This not only legally violates the letter and spirit of NEPA, but it confounds the purpose altogether—NEPA exists to make sure that all relevant environmental impacts are considered before an agency adopts a specific Alternative.

NNSA notes in its comment response that it is not precluded from gathering the necessary information by exorbitant costs, nor is the means to obtain the relevant information unknown—the two exceptions granted

by NEPA. The only barrier to completing a thorough and scientifically valid earthquake study, says NNSA, is time.

NNSA attempts to evade the requirements of NEPA in this case by declaring that it has presenting the “worst-case consequences of an earthquake involving ELP facilities,” and has found those consequences to be “not significant.” Here again, NNSA begs the two key questions—how can the worst-case scenario be known if the performance of the buildings in a seismic event is not known and will not be until further studies are concluded? The current accident consequence analysis asserts that exposures in the case of a nuclear criticality event would be limited by the walls of the facility—a presupposition that the walls will remain standing in a design-basis earthquake. But even the current state of knowledge indicates that is unlikely. The second question is: what about the rest of Y-12? The SA is required to look at the site-wide impacts of an earthquake (it is, after all, analyzing the adequacy of a site-wide EIS); including in the near future the 9212 Complex.

Comment 35.

The response to Comment 35 fails to answer the commenter’s concern. Once again, NNSA seeks to limit its responsibility to the buildings involved in the EU program. Once again, we go on record to note the SA is addressing a Site-Wide EIS; it must consider the impact of an earthquake on the entirety of the Y-12 site, including not only the EU program buildings, but other buildings, legacy facilities, contaminated sites, storage tanks—the entirety of the site. Failure to do so means Y-12 has not been subject to a thorough and complete review of its environmental impact since 2001—a period of 20 years.

Comment 38.

In its final response, to Comment 38, NNSA attempts to cordon off some activities at Y-12 from consideration in the SWEIS process, like the Integrated Facilities Disposition Program, declaring that they are acting independently under CERCLA and are outside the scope of this SA. If the 2011 SWEIS and the 2020 SA limited their examination to the EU program, NNSA might have a point. But the decision to prepare a Site-Wide EIS in 2011, which was appropriate, now requires the 2020 SA to look at the entire Y-12 site. The 2011 SWEIS does not, for instance, declare the IFDP to be outside the scope of the SWEIS. It provides a cursory description of the program as it is projected into the future. Now, nine years later, the IFDP program—including the waste streams resulting and the ongoing risks presented by buildings at Y-12—is more mature and can be included in a Site-Wide assessment of the environmental impact of activities at Y-12. We also note that while DOE’s practice has been to exempt CERCLA programs from its NEPA analyses, there is no allowance for that in NEPA or the CEQ Regulations.

The necessity of a site-wide assessment is further underscored by the nature of the current analysis and its focus on earthquake impacts—an earthquake is the one natural phenomena that is indiscriminate; its impact will be site-wide, the consequences to workers, the public and the environment must be considered cumulatively as they can not be artificially and unrealistically segmented. A tornado might have a selective impact, obliterating one structure and leaving a similar one nearby unscathed. A devastating terrorist attack or an accident—the crashing of a jet into one of the buildings at Y-12— could impact the targeted structure and perhaps those nearby, but other parts of the site might be relatively untouched. Not so an earthquake. It will shake every structure and require a response, whether the structure is a one-story concrete building or a sixty foot tall top-heavy tank containing millions of gallons of liquid hazardous waste like those that overlook a portion of Y-12.

Finally, we note that it is not the job of an SA to conduct the actual analysis required by an EIS. An SA’s purpose is to take a look at the existing EIS in light of new information and to decide if the EIS stands or not. If it does not, the remedy prescribed by NEPA is not to turn the SA into a mini-Supplemental EIS of limited scope as NNSA has done here. The remedy is to prepare a new EIS or a Supplement to the old EIS.

The attempt to make the Final SA into a mini-Supplement to the 2011 SWEIS fails not only because NNSA refuses to analyze the impact of an earthquake on the entire Y-12 (the SW in SWEIS), but also because key information about buildings NNSA intends to use for 20-30 more years, buildings already acknowledged to be in non-compliance with current building standards, is not yet known and will not be known until studies are concluded.

CONCLUSION

Once NNSA made the decision that it would craft the narrowest possible interpretation of the September 2019 order of the US District Court, that it would confine its analysis to the Enriched Uranium operations buildings rather than consider the cumulative, cascading effects of an earthquake site-wide at Y-12, and that it would under no circumstances find that the 2011 SWEIS needed to be supplemented or re-done, it was required, by its own decision, to ignore many of the most significant comments provided by the public.

Site-wide consideration of the consequences of a major earthquake was no longer possible within NNSA's self-imposed boundaries. Consideration of non-radioactive toxic and hazardous materials likewise out of bounds. And consideration of the effects of contaminant releases, coupled with criticality events, on the non-human environment—animals, plants, soils and water—was beyond their self-imposed scope.

As a result, NNSA's response to comments, as demonstrated time and time again in the Final SA, was bound to be inadequate. Legitimate concerns of the public which pointed to the requirements of NEPA, had to be set aside or treated dismissively because they would have put NNSA in the position of making the determination it had already decided could not be made—that a new SWEIS or a thorough Supplement to the 2011 SWEIS was required.

OREPA's enumeration of our continuing concerns here highlights what we consider to be the most egregious failures of the Final SA's response to our comments; they should not be construed as accepting other parts of the Final SA or the responses to other comments, as adequate.

OREPA believes NNSA is currently operating outside the bounds of the law. By taking the decision to continue construction of the Uranium Processing Facility, a decision that pre-determines that the other EU facilities will continue to be used regardless of the outcome of future NEPA analysis or other safety studies, and declaring it has the right to carry out its program "in the interim" while it satisfied NEPA, NNSA renders NEPA a dead letter. It has committed irretrievable resources, literally in concrete and rebar, to a plan that has yet to be fully examined with the "hard look" required by NEPA.

We call on NNSA to withdraw the Final SA and to stop construction of the Uranium Processing Facility until such time as the entire Enriched Uranium program is subject to an adequate NEPA analysis in the context of a Site-Wide Environmental Impact Statement that considers the ongoing impacts of operations at Y-12 and their effect on the whole of the environment.

This new or Supplement SWEIS should consider a Maximum Risk Reduction/Mission Capacity Preservation Alternative that would permit NNSA to continue its Stockpile Stewardship and Maintenance program, support the dismantlement of retired nuclear weapons components, and prioritize health and safety protections of workers, the public and the environment.

Submitted 14 August 2020
Ralph Hutchison, coordinator
Oak Ridge Environmental Peace Alliance

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Comments on NNSA 2020 **“Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex, Earthquake Accident Analysis.”**

David D. Jackson August 14, 2020

A brief paraphrased version of my comments on the Draft Supplement 2019 included the following items in *bold* text. My additional comments on NNSA response as reported in the 2020 “Final Site Wide...” are in *italics*.

Peak Ground Acceleration (PGA), as reported in the USGS PSHA documents, considers only one intensity measure of potential earthquake damage. Other intensity measures other than PGA, such as peak velocity and duration, should be considered.

NNSA mentions on page 9 that other parameters are part of a full-scale PSHA, with no statement that they have been considered specifically in the “Final”.

The reason for focusing on a specific set of PGA parameters, here 2% probability in 50 years, is arbitrary. The appropriate choice of intensity measures and thresholds depends on risk tolerance, which depends on the consequences of specific intensity measures and parameters.

NNSA responds that “DOE requirements for seismic analysis are consistent with industry standards and represent an appropriate evaluation basis to assure acceptable risk to the public and the environment.” They then refer to four DOE documents with dates from 2014 to 2017; mention that Buildings 9201-2E, 9215, and UPF facilities are considered SDC-2 facilities, that 2% in 50 years is deemed appropriate for such facilities, and that hospitals, fire stations, and emergency operations centers share the same criterion. My response is that these are quite generic conditions which don’t necessarily capture the risk consequences of the Y-12 facility. Note also that the consequences of damage to more than one structure accumulate with the number of structures, so that risk tolerance must depend on the scale of the target.

The Draft Supplement did not discuss USGS 2016, 2017, 2018 updates to the PSHA studies.

In the “Final” NNSA notes in footnote 5 on page 7 that USGS plans to update its PSHA documents and the NNSA will incorporate updates as they become available. They did not mention the 2016, or 2017, updates specifically. They mention by website link a 2018 update, asserting that “That update shows a slight reduction in the seismic hazard for the Oak Ridge area.” They provide no further details, such as which intensity measure they are considering. Also, the 2016 – 2018 USGS reports were in response to risks associated with human activities such as fluid pumping, which are intrinsically time dependent. Such human activities near Oak Ridge in the future could affect earthquake activity there.

The NNSA documents to date fail to consider the difference between design performance and actual resilience of 9204-2E and 9215, which fail to meet modern standards.

On page C-19 in Appendix C, NNSA mentions “Detailed walk-downs and inspections have been conducted on a regular basis to determine any aging concerns in the facilities. Any aging related degradation is mitigated to ensure the design capacities of the facilities are not impacted.” No details of specific standards or actions were provided. Then NNSA states “In addition, the existing condition of the facilities are being considered in the ELP natural phenomena evaluations to determine if cost-beneficial upgrades can be made.” The words “are being” and the mention of cost leaves no assurance that the resilience of the buildings is even known, let alone acceptable.

Estimates of large earthquake risk assume that large earthquakes occur only on presently identified “capable faults,” while large earthquakes frequently violate that assumption.

NNSA do not address this statement specifically. They mention that Lettis Consultants International, Inc. are presently preparing an updated PSHA for the Y-12 complex. Lettis has considerable experience in PSHA studies for nuclear and other facilities. To my knowledge they have not confronted the fact that large earthquakes occur where there are no previously recognized capable faults. If their new report should neglect that fact, they will have several examples to explain, including the largest strike slip earthquake measured seismologically anywhere on earth (magnitude 8.6, 2012, off west coast of Sumatra). However, the Lettis work is not yet completed, so its relevance to consequences at Y-12 can’t be considered as evidence of risk, or lack of it.

NNSA did not adequately consider secondary hazards

Secondary hazards from earthquakes include fires, release of toxic materials, tsunamis, landslides, ground liquefaction, ground displacements, ground subsidence, dam failure, floods, damage to rescue and repair facilities, reactions of people, and many other possibilities. The new section 3.2.5 addresses seismically induced fires and toxic releases to some extent. Because those calculations depend intrinsically on expected seismic shaking intensity, they are limited by assumptions made regarding primary earthquake effects. The most serious limitations are dependence on the consideration of PGA only (neglecting shaking duration, for example) and assuming that large earthquakes occur only on recognized capable faults.

Clearly tsunamis are not a threat in Tennessee, but the other secondary effects listed above are possible and not mentioned in the NNSA Final report.

NNSA did not provide adequate analysis of risk for existing buildings, which should consider nonlinear calculations and duration of shaking.

On page C-16 in Appendix C, NNSA mention non-linear effects as a possible cause of reduced shaking intensity compared to a linear study. Nonlinear soil effects and non-linear response of some building material may reduce the stress imposed by a given strain and thus reduce the forces on other parts of a structure. However, non-linear effects also include progressive defects and weakening of structural elements, causing greater damage especially for long-lasting shaking. That is why shaking duration is an important intensity measure. I mentioned this in my response to the 2019 Draft NNSA report, but there is no response in the 2020 “Final.”

NNSA lacks commitment to follow DNFSB recommendations

On page C-15 of Appendix C, NNSA merely mentions that “there are other established mechanisms for responding to reports from organizations such as the Inspector General and DNFSB. No mention is made of what those mechanisms are, whether or not those recommendations have been or will be

*followed, or why those recommendations are not relevant to the **Final Supplement Analysis for the Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex, Earthquake Accident Analysis.***

In summary, NNSA has failed to address serious environmental risk issues that I have raised twice in response to the 2018 Draft Site-Wide Analysis. These issues include:

- reliance on one arbitrary intensity measure, PGA, for earthquake damage potential, neglecting shaking duration and many others
- arbitrary choice of 2% in 50 years (same criterion used for a single fire station) to represent the risk tolerance for a large nuclear facility
- demonstrably false assumptions that large earthquakes can only occur on pre-recognized “capable faults”
- neglect of many secondary effects of earthquakes that could cause damage to the Y-12 facility itself and limit the functional support in the surrounding region needed for earthquake response.

Furthermore, NNSA continues to rely on promised future engineering and seismological studies as if they were completed and their conclusions were known and validated.