SRS WATCH

Savannah River Site Watch

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Comment for the Formal NEPA Record before Issuance of the Record of Decision (ROD) for the *Final Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina*

Critical Questions Remain Concerning Proposed SRS Plutonium Bomb Plant (PBP)

This submission is being made into the formal document record for the *Final Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site in South Carolina.*

The information contained herein was unavailable during the comment period on the EIS in question and is important to the matter at hand. The documents and issues raised in them must be taken into account before the preparation and issuance of any Record of Decision on the EIS. This submission will get important information into the National Environmental Policy Act record for the EIS being addressed.

I note that there is nowhere in law mandating pit production at the Savannah River Site. Thus, this is a DOE decision that can be reversed by the agency or stopped by Congress. Any ROD that might be issued must affirm no legal requirement to pursue pit production at SRS.

I hereby submit two documents for the official NEPA record:

1. An article from the Exchange Monitor, September 10, 2020, **titled *TRU Waste 'Far and Away' Largest Challenge for NNSA Pit Mission, Official Says***. The text of the article is below.

2. A Government Accountability Office (GAO) *report, September 2020, titled* ***NNSA Should Further Develop Cost, Schedule, and Risk Information for the W87-1 Warhead Program*** *(*GAO-20-703**).** Posted on GAO website: https://www.gao.gov/assets/710/709253.pdf. This document is pertinent to problems facing plutonium pit production for the proposed W87-1 warhead. Overview and recommendations of the report are linked here: https://www.gao.gov/products/gao-20-703

Details about the Submitted Documents

1. The ability of the Waste Isolation Pilot Plant (WIPP) to receive TRU waste from pit production is one key in NNSA's challenges to carry out the pit project as now presented. The volume of WIPP, capped by law, is totally overlooked in the EIS. The ability of WIPP to receive TRU from pits should have been reviewed in the EIS and must be still reviewed in a Programmatic Environmental Impact Statement (PEIS) on pit production, which NNSA has so far refused to prepare.

The article below makes it clear that NNSA realizes the volume problem with WIPP but has not reviewed this matter in the SRS pit EIS or in the mandated PEIS. Given large volumes of TRU proposed to be produced by pit production, WIPP volume limits are a "choke point" in pit production.

NNSA appears to assume that the Land Withdrawal Act will be changed and the volume cap on WIPP lifted. Likewise, NNSA seems to assume that the WIPP license will be extended for a lengthy period of time. Both assumptions may prove to be incorrect. Likewise, even if the WIPP license is extended conditions could be put on TRU received, such as no receipt of newly generated TRU waste (such as from unnecessary pit production).

SRS Watch has filed a Freedom of Information Act request for the NNSA presentation mentioned in the article below and NNSA has confirmed in an initial response that the request, which is attached, has been received and is being processed.

The points raised in the article below by the NNSA official must be responded to in any final ROD that might be issued.

Exchange Monitor, September 10, 2020

https://www.exchangemonitor.com/pit-waste-far-away-biggest-challenge-nnsa-pit-mission-official-says/

TRU Waste 'Far and Away' Largest Challenge for NNSA Pit Mission, Official Says

Addressing the elephant in the desert, an official with the National Nuclear Security Administration (NNSA) on Wednesday warned that ongoing nuclear-weapon maintenance will require a transuranic waste disposal site that is open beyond 2050: the current, best-case availability for the Waste Isolation Pilot Plant in New Mexico.

"From an NNSA perspective, with an enduring mission, we are going to continue to have a need to dispose of transuranic waste past 2050," James McConnell, the Department of Energy agency's associate administrator for safety, infrastructure, and operations, said Wednesday at the ExchangeMonitor's virtual RadWaste Summit.

"Far and away the biggest challenge for NNSA is to make sure that the disposal system for transuranic waste is robust enough to not become a choke point for our mission," McConnell said.

The Waste Isolation Pilot Plant is DOE's only deep-underground disposal facility for transuranic waste. In order to operate the facility into the 2050s, the agency needs New Mexico to modify the site's operating permit. As written, the permit requires the federal government to stop burying waste at the site in 2024, then spend a decade safely closing down the facility.

The NNSA plans in 2024 to start casting new war-ready plutonium cores for nuclear warheads at the Los Alamos National Laboratory in New Mexico. It expects to expand production to a combined 80 pits annually at Los Alamos and the Savannah River Site in South Carolina by around 2030. The associated waste stream from the mission will one day make the nuclear weapons agency the largest generator of transuranic waste in the Department of Energy complex.

That will not happen until 2038 or so, "so there's time to figure out what this means, both in terms of management and availability of continued disposal," McConnell said.

> Transuranic waste, or TRU waste, is equipment and material contaminated with elements heavier than uranium, typically plutonium. Pits are the fissile cores of nuclear weapons, and the first to be cast later this decade will be for warheads to tip the planned fleet of Ground-Based Strategic Deterrent intercontinental ballistic missiles.
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> After starting production four years from now, the NNSA plans to produce 30 pits a year at Los Alamos starting in 2026, then 80 a year by 2030 by adding another 50 pits annually at the Savannah River Site.
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> Either site could, at least temporarily, handle all 80 pits on its own. In that 80-pit solo configuration, Los Alamos would annually generate a mixture of roughly 400 cubic yards (about 305 cubic meters) of transuranic and mixed transuranic waste. The NNSA projects Savannah River to generate more waste than that to produce just its nominal 50 pits a year: 1,365 cubic yards (or almost 1,045 cubic meters) of transuranic waste annually.
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> Casting 80 pits a year by using both factories would produce about 19,200 cubic yards, or some 14,680 cubic meters, of transuranic waste from 2030 to 2050, according to slides McConnell briefed at the conference.
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> He said the NNSA, together with DOE's Office of Environmental Management, will begin a collaborative review "in the very short coming weeks" about the future NNSA TRU waste generator sites.

2. The GAO's September 2020 report ***NNSA Should Further Develop Cost, Schedule, and Risk Information for the W87-1 Warhead Program*** holds interesting information about pit production and bottlenecks ahead and this should have been discussed in the EIS and must be discussed in any ROD that might be issued and also in mandated PEIS.

I hereby submit the attached GAO document for the EIS record. It can be found at: https://www.gao.gov/assets/710/709253.pdf

Below are some key pit-related extracts from the document, hereby submitted for the EIS record. These extracts and the whole of the document must be responded to in any ROD and in the legally mandated PEIS.

Likewise, similar issues concerning production of the pits for the proposed W93 warhead must be addressed.

Excerpts concerning pit production in the GAO document:

> It is not clear that NNSA will be able to produce sufficient numbers of pits—the fissile cores of the primary—to meet the W87-1 warhead's planned production

schedule. Recent NNSA and independent studies have cast doubt on NNSA's ability to ready its two planned pit production facilities in time. If one facility is not ready to produce pits in the early 2030s, for example, NNSA would likely produce fewer weapons than planned, according to GAO's analysis of NNSA plans. (introductory page)

We were unable to fully assess the extent to which the two pit production facilities will be ready to produce pits for the W87-1 because NNSA's plutonium program—which is managing the facility readiness efforts—has not yet completed an integrated schedule for the overall pit production effort. An integrated schedule is important, according to best practices, because it integrates the planned work, resources, and budget. An NNSA official stated that the program was building a schedule, but could not provide documentation that it would meet best practices. A schedule consistent with best practices would provide NNSA with better assurance that it will have adequate pits to meet planned W87-1 production. (introductory page)

The W87-1 will be the first weapon that NNSA has produced using entirely new or remanufactured nuclear and nonnuclear components since the end of the Cold War. However, as we have reported, many of the facilities that may be needed to provide components for the W87-1 are inadequate and are undergoing modernization to either build new facilities or repair existing facilities and capabilities, which represents a critical external risk to the program.9 For example, the United States is limited currently to production of development pits; it has not manufactured a new pit for use in a weapon since 2012, and has not had the capability to produce more than 10 pits per year for over 2 decades. (page 5)

To examine the extent to which NNSA will be able to produce sufficient numbers of key nuclear components to meet W87-1 production needs and has mitigation plans to address risks if production is insufficient, we reviewed NNSA's fiscal year 2019 Production and Planning Directive, which provides current and estimated nuclear weapons stockpile quantities for current and future years. It also defines the activities necessary—including pit and secondary production—to support the stockpile. In this report, we present pit and secondary production according to the plans noted in the 2019 Production and Planning Directive, which represented the best available information at the time of our review on the number of weapons and key components needed. At the time of our review, the Nuclear Weapons Council had not yet determined the number of W87-1 warheads that NNSA will produce; warhead production figures are based on preliminary information supplied by NNSA officials according to their knowledge of production plans.13 We also interviewed NNSA officials from the W87-1 program office and plutonium and uranium program offices to obtain their views on the production needs and time frames for the W87-1 program, the W87-1 program's plan for developing a risk mitigation framework, and risk mitigation planning. To assess risk mitigation concepts, we reviewed

studies from Lawrence Livermore National Laboratory (Lawrence Livermore) regarding the reuse of previously-manufactured pits and related reports by independent expert groups. We interviewed DOD officials to obtain their views on efforts to align production of the W87-1 with the GBSD program, and their views on the risk of insufficient pits to sustain the W87-1 program. (pages 7-8)

Under DP programs separate from the W87-1 program, NNSA is undertaking a comprehensive effort to expand and modernize the facilities and infrastructure that make up the nuclear security enterprise. As part of this effort, NNSA is modernizing and repurposing the production facilities to produce the pits and secondaries needed for the W87-1, as described below:

Production facilities for pits: NNSA is developing the capability to produce and certify one pit in 2023, produce up to 30 pits in 2026, and to produce up to 80 pits during 2030.
In 2014, the Nuclear Weapons Council also affirmed to Congress that it needs NNSA to develop a capability to produce 50 to 80 pits per year. To achieve this production, in May 2018 the NNSA Administrator provided Congress with NNSA's plan to split pit production between facilities at two sites. According to NNSA, this dual approach is the best way to manage the cost, schedule, and risk of such an undertaking and provide increased resiliency, flexibility, and redundancy by not relying on a single production site. For the first prong of this plan, NNSA is modernizing its Plutonium Facility (PF-4) at LANL to produce 30 pits per year starting in fiscal year 2026. The second prong is to repurpose the partially constructed Mixed Oxide Fuel Fabrication Facility at the Savannah River Site (SRS) in South Carolina to produce 50 pits per year under an effort now called the Savannah River Plutonium Processing Facility. According to NNSA documentation, the agency preliminarily estimates that modernization of PF-4 will cost up to $3 billion over the next 5 years, and that converting and bringing the facility at SRS online will cost approximately $4.6 billion.27 NNSA uses funds from the plutonium program for these projects. (pages 14-15)

NNSA's plans call for ramping up its pit production capabilities to 30 pits per year at LANL by 2026 and 50 pits per year at SRS by 2030, according to NNSA documents (see table 1). This schedule is intended to support production through to final production of the last W87-1 in 2038. (page 15)

According to the CEPE review, the requirements limited the analysis of design options. As a result, during Phase 6.1, NNSA screened out from further consideration a "status quo" option to refurbish the W78—before evaluating the costs and benefits of that option against those of all other options—because it did not meet the military requirements, particularly for safety.31 In addition, in early Phase 6.2 before the program was suspended, NNSA chose the pit and secondary to include in the W87-1 without comparing costs and benefits of all options, according

to CEPE's review. The CEPE review noted that NNSA, in its analysis to support the selection of the W87 type pit, had included limited cost and risk assessments for certification but that a basis of estimate for the costs and the risk assessment methodology was not included. According to AOA best practices—first published in December 2014, after the program's suspension—an analysis of alternatives study should evaluate all alternative options…" (pages 18-19)

In fiscal year 2018, Congress directed NNSA to report on the estimated cost of a W78 refurbishment—or status quo option—compared to the estimated cost of the W87-1.37 As discussed, NNSA had previously omitted the W78 refurbishment option from further study because a W78 refurbishment would not meet military requirements. Congress's direction followed the February 2018 Nuclear Posture Review direction to NNSA to restart the W87-1 program with a focus on providing a warhead for the Air Force's GBSD. NNSA reported that the Nuclear Posture Review direction removed the design constraint for an interoperable warhead. In its report to Congress, NNSA reported that the estimated cost for the concept of a W78 refurbishment would be close to the estimated cost of the W87-1, excluding the cost of producing the new pits for the W87-1; a W78 refurbishment would involve reusing existing W78 pits and not producing new pits.38 NNSA estimated a W78 refurbishment could cost from $8.5 billion to $14.3 billion compared with NNSA's December 2018 estimate for the W87-1 of $8.6 billion to $14.8 billion. NNSA separately estimated that producing the new pits for the W87-1 could add $300 million to $750 million to the cost of the warhead, resulting in a cost range of from $8.9 billion to $15.6 billion.39 (See table 2.) These costs are in addition to NNSA's estimate of up to approximately $3 billion to modernize LANL's PF-4 and approximately $4.6 billion to convert and bring the SRS facility online to produce pits. According to NNSA officials, these facilities would need to be modernized for future weapons programs in addition to the W87-1. (pages 21-22)

NNSA may be able to produce sufficient numbers of secondaries but has less assurance that it will be able to produce sufficient numbers of pits to sustain W87-1 production on its current schedule. NNSA has some assurance that it can produce sufficient numbers of secondaries to align with the W87-1 production schedule because it currently has secondary production capabilities that it can use if construction of the UPF or modernization of existing facilities is delayed and the UPF is meeting its current schedule baseline. Y-12 has been producing secondaries for many years and, according to the uranium program manager, could continue to use Y-12's functional but deteriorating facilities for several more years, if necessary, to compensate for a delay in UPF or the modernization of the other facilities. According to the uranium program manager, the capabilities and capacity of the UPF are aligned with the W87-1 program, and the program has sufficient time to prepare for production of the secondaries needed for the W87-1 program by fiscal year 2029—when they will be needed to support production of the first W87-1 warheads in fiscal year 2030. (page 29)

However, NNSA has less assurance that it will be able to produce sufficient numbers of pits in time to sustain W87-1 production on its current schedule. NNSA has sought to reestablish a pit production capability for over 20 years. Achieving the capability to produce 80 pits per year by 2030 is NNSA's highest infrastructure priority, according to the NNSA Administrator. NNSA's planned production of W87-1 warheads depends entirely on NNSA's capability to produce up to 80 pits per year from the combined production of the two facilities at LANL (up to 30 pits per year) and SRS (up to 50 pits per year). (page 29)

The W87-1 program has not yet developed formal risk mitigation plans to address the risk of insufficient pits to sustain W87-1 production, and both the W87-1 program and the plutonium program have only notional concepts to address this risk. If NNSA does not make sufficient W87-1 pits to sustain W87-1 production, the W87-1 program's initial notional concept for mitigating the risk to W87-1 production would not meet military requirements and would be costly. According to NNSA's May 2019 report to Congress, Lawrence Livermore documentation, and W87-1 program officials, NNSA's primary risk mitigation concept is to reuse some pits until new W87-1 pits are available. According to NNSA's May 2019 report and Lawrence Livermore documentation, when sufficient W87-1 pits are available later, NNSA could perform a second alteration to replace the reused pits with a W87-1 pit. This approach would increase the amount of work needed to complete a W87-1 warhead, likely delaying final production, and could have an impact on the availability of personnel and facilities for subsequent LEPs. (page 34)

NNSA officials and Lawrence Livermore representatives told us that Lawrence Livermore has studied reuse of pits and is confident that the pits could be a technically viable backup option. Lawrence Livermore documented its evaluation of pit reuse in three studies dating from 2013 through 2015, each of which determined that pit reuse was a viable option for consideration. Specifically, in 2015, Lawrence Livermore documented its achievement of a significant milestone in its predictive capabilities for modeling pit reuse in support of the goal of certification of a pit reuse system without underground nuclear testing. An independent expert group has also stated that it would be technically feasible to reuse pits. (page 35)

The W87-1 program could be the most expensive modernization effort to extend the life of or replace a warhead since the end of the Cold War, according to preliminary NNSA estimates. The feature and component design decisions that remain could have an effect on program cost, but NNSA does not yet have study plans that would help ensure that the program employs consistent, reliable, and objective approaches for analyzing the costs and benefits of these remaining decisions. The DP program execution instruction recommends, but does not require, that design studies similar to AOAs for LEPs and replacement programs

employ the analytic rigor and best practices of NNSA's AOA procedure for capital asset acquisitions. Instead, under the DP program execution instruction, NNSA allows programs such as the W87-1 to tailor their approach and deviate from the best practice guidelines in the NNSA business procedure to meet program needs. Requiring the W87-1 program to have study plans for the remaining feature and component design studies consistent with the best practice guidelines for such plans in NNSA's AOA procedure would provide assurance that the studies apply consistent, reliable, and objective approaches. More generally, revising the DP instruction to require that design studies for LEPs and replacement programs follow AOA best practices, such as by having a study plan, would provide NNSA with better assurance that such programs apply consistent, reliable, and objective approaches to assessing the best options to meet mission needs. (page 38)

NNSA will need to produce newly manufactured pits and secondaries for the W87-1 warhead, which represents a critical external risk to the W87-1 program. NNSA's production schedule for the W87-1 warhead depends on NNSA's ability to meet its production goals for key nuclear components. In fact, achieving the capability to produce 80 pits per year by 2030 is NNSA's highest infrastructure priority, according to the NNSA Administrator. However, it is not clear whether NNSA will be able to produce sufficient numbers of pits to meet W87-1 production needs, which could significantly impact production of the W87-1 warhead. We were unable to assess whether NNSA's plutonium program was on track to produce sufficient pits because the program is developing but does not yet have an integrated master schedule for pit production. The plutonium program manager stated that the program intends to pursue elements of a NIMS approach but did not provide us with documentation demonstrating that it would do so, or when. An integrated master schedule is the focal point of program management, according to best practices, because it integrates the planned work, the resources necessary to accomplish that work, and the associated budget. NNSA's effort to produce the W87-1 depends on NNSA's ability to produce up to 80 pits per year. Given the importance of this program to warhead production, it is essential that the integrated master schedule being developed by the plutonium program for pit production meets NIMS standards, consistent with best practices for schedule development, to provide assurance of sufficient pits for the W87-1 program. (page 38-39)

The W87-1 program also has not yet developed documented risk mitigation plans to address the risk of insufficient pits to sustain W87-1 production. W87-1 program officials stated that it was too early to do so, that NNSA had plenty of time to respond if that risk developed, and that to use scarce resources to plan for an alternate strategy would run counter to the agency's program of record. However, by prioritizing the development and documentation of a risk mitigation strategy, NNSA would be better positioned to respond to the clear risk that the plutonium program may not be able to supply sufficient pits to sustain W87-1 production. (page 39)

Given the findings of the GAO document, it is clear that many questions remain about technical, scheduling, costs and associated environmental impacts of plutonium pit production at SRS, including volume of TRU that would go to WIPP.

It is assumed that the first pits to be produced for the W87-1 pit, a matter which must be clarified in the NEPA record. A determination of warhead "need" by Congress and scheduling and costs of production of the W87-1 warhead will in large part dictate pit-production activities at SRS were Congress to authorize and fund the proposed project. The issue of "need" for the warhead and schedule and cost of associated pit production for it must be fully addressed in any ROD that might be issued.

As the EIS did not address the key matter of volume of pit waste planned for disposal in WIPP via production of pits for the W87-1, W93 and existing warheads, this matter must be addressed in the ROD or it will be deficient.

Additionally, the EIS discussed "judicious reuse" of existing pits but just what that is was not discussed. See page S-4: "For the foreseeable future, NNSA will rely on a combination of newly manufactured pits and judicious reuse of existing pits to modernize the U.S. nuclear stockpile. This judicious reuse is an element of pit production analyzed in this SRS Pit Production EIS." The term "judicious reuse" of pits is not defined but must be defined and described in detail. For what warheads, including the proposed W87-1 and W93, would pits be reused?

Finally, the environmental impacts of pit planning and production at other DOE sites is still lacking and must be reviewed in the NEPA record and legally mandated PEIS. Those sites with unanalyzed pit impacts include Lawrence Livermore National Lab, Kansas City National Security Campus, National Nuclear Security Site, Y-12, Sandia National Lab and Pantex.

The above submitted comments and information and attachments and information in them must be addressed in any ROD that might be issued on the SRS Plutonium Bomb Plant. Issuance of a ROD will be premature if these matters are not addressed in any ROD.

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