



Savannah River Site Watch

## Plutonium Pondering

January 23, 2023

**The Department of Energy must fully reveal how much surplus plutonium it has already sent from the Savannah River Site (SRS) and other DOE sites to the Waste Isolation Pilot Plant (WIPP). And, DOE must reveal how much plutonium it plans to send to WIPP.**

**The current effort to send more surplus plutonium from SRS to WIPP took shape in 2011.**

On January 13, 2023, the U.S. Department of Energy's National Nuclear Security Administration issued a statement (<https://www.energy.gov/nnsa/articles/nnsa-and-doe-em-complete-first-shipment-downblended-surplus-plutonium-transuranic>) that said "The Department of Energy's National Nuclear Security Administration and Office of Environmental Management completed the first shipment of downblended surplus plutonium transuranic (TRU) material from K-Area at the Savannah River Site to the Waste Isolation Pilot Plant in New Mexico in December." No amount of plutonium shipped was given.

The statement also says that "This shipment marks a milestone as the first shipment to include defense TRU material from [NNSA's Surplus Plutonium Disposition Program](#). After plutonium is downblended at SRS, it becomes TRU material by definition and can be permanently disposed at WIPP."

DOE's plutonium disposal at WIPP merits closer scrutiny. Was the stated shipment in January 2023 the first shipment of downblended surplus weapon-grade plutonium from SRS to WIPP? No, it was not. It was the first DOE shipment from the K-Area and the first shipment to WIPP under the commitment to the State of South Carolina to remove plutonium from the state but that shipment occurred a decade after the first surplus plutonium was shipped from SRS to WIPP.

Plutonium downblended into "pipe overpack containers" (POCs) and placed into drums were shipped from SRS to WIPP in 2013 and later. In March 2015, I and other NGO colleagues stood outside the storage building in E-Area at SRS where containers of downblended plutonium were said to be stored in concrete culverts that we viewed. That material was being held at SRS as WIPP was temporarily closed due to [accidents in February 2014](#). (I can provide a photo of the culverts in E-Area on request.)

The Office of External Affairs at SRS communicated to me on March 20, 2014 that “Savannah River Site has begun shipments of non-moxable plutonium to WIPP and to date, approximately 55 kgs of down blended plutonium has been shipped to WIPP. SRS has approximately 260 pipe overpack containers of down blended plutonium awaiting shipment to WIPP as soon as it reopens.” Thus, ~94 kilograms of SRS plutonium (55 kilograms + 260 POCs x ~0.15 kg/POC) had already been shipped or was ready to be shipped at the time that WIPP closed for 3 years starting in February 2014.

Just before that observation in E-Area, we had been shown the type of containers into which downblended plutonium was mixed, a “pipe overpack container” as well as the larger capacity “criticality control overpack” (CCO). (I can provide photos of those mockup POCs and CCOs on request.) Currently the CCO is the preferred container into which surplus plutonium is packaged. Such relatively pure plutonium “surplus to defense needs” is to be contrast with “legacy plutonium” related to “clean up” of DOE projects.

Then, on October 1, 2015, I and some of the same NGO colleagues stood next to TRU drums containing SRS POCs as they sat stranded on the surface in the Waste Handling Building at WIPP, awaiting disposal underground, which we then toured. (I can provide a photo of me standing beside the drums containing the SRS plutonium on request or see [the photo linked here](#)).

According to the WIPP Data System, checked by a colleague at the time, the drums containing SRS POCs were taken underground in January 2017, as part of the effort to clear the backlog in the Waste Handling Building prior to the [first new TRU shipments being received at WIPP on April 17, 2017](#).

The SRS plutonium shipped to WIPP prior to February 2014 and after WIPP reopened in January 2017 was authorized by DOE under an “Interim Action Determination” (IAD) entitled “Disposition of Certain Plutonium Materials Stored at SRS” and dated October 17, 2011. ([https://www.srs.gov/general/pubs/envbul/documents/Interim\\_Action\\_500kg\\_to\\_WIPP\\_10-17-11.pdf](https://www.srs.gov/general/pubs/envbul/documents/Interim_Action_500kg_to_WIPP_10-17-11.pdf))

That “determination” allowed for disposal of approximately 500 kilograms of SRS plutonium in WIPP in “pipe overpack containers.” The material was to be prepared in the now-closed HB-Line located in the H-Canyon reprocessing plant. The IAD said the POCs prepared in the HB-Line would be “staged for shipment” in the E-Area before shipment to WIPP.

The IAD was signed by Dave Moody, the SRS site manager (and former WIPP manager), a position under the DOE’s Office of Environmental Management and not under NNSA. This monumental plutonium-disposal decision, which set the stage for the current consideration of disposal of huge amounts of SRS plutonium in WIPP, should have been the subject of a full-scale Environmental Impact Statement and not a mere bureaucratic decree.

The IAD was the initial effort to process at SRS and dispose of tens of tons of additional surplus weapons plutonium in WIPP. This effort was pursued long before the plutonium fuel (MOX) debacle was officially terminated in 2018 but when storm clouds were gathering over the ill-fated MOX project. Even in 2011, it was seen that there was a cheaper and quicker option for plutonium disposal than making MOX fuel of it. The colossal DOE error in 2002 to terminate the project to immobilize plutonium in high-level nuclear waste at SRS loomed in the background, as it still does.

Though the plutonium involved was part of the program to dispose of surplus plutonium, the highly significant IAD is left out of the timeline and not discussed in the draft EIS on the [Surplus Plutonium Disposition Program](#) currently reviewing disposal of 34 MT of plutonium in WIPP.

I assume that the ~94 kg of downblended SRS plutonium may have been all that was shipped under the IAD decision from SRS to WIPP prior to the WIPP accidents in February 2014 and prior to downblending starting in the K-Area in 2016. DOE must break its silence and officially reveal in the EIS just how much SRS plutonium was shipped to WIPP under the campaign that resulted from the IAD.

In my opinion, of the entire processing, transportation and disposal cycle, the greatest risks to workers and the public occur during plutonium processing related to plutonium oxide preparation and the mixing and packaging of the downblended material into the disposal containers.

K-Area downblending at SRS, using plutonium oxide prepared via ARIES (Advanced Recovery and Integrated Extraction System) at Los Alamos National Lab, was authorized by a Record of Decision addressing 6 MT of surplus plutonium, as stated in a [Federal Register notice of April 5, 2016](#). That 6 MT is not part of the 34 MT that has been analyzed in the draft EIS now before us, so DOE is actually now actively looking at sending 40 MT of surplus plutonium to WIPP. Crazy as it sounds, all of that 40 MT, mostly from weapons “pits” stored at DOE’s Pantex site in Texas, would be processed into oxide at LANL and shipped cross country to SRS.

As the draft EIS states: “In 1994, after the end of the Cold War, the President of the U.S. declared 52.5 metric tons (MT) of plutonium to be surplus to the defense needs of the Nation. In 2007, the U.S. declared an additional 9 MT of plutonium to be surplus.” And, further, “The 34 MT of surplus plutonium evaluated for disposition in this SPDP EIS is a subset of the 61.5 MT of surplus plutonium described above (52.5 MT plus 9 MT).” (page S-1) DOE makes no mention of what might happen to the quantity of surplus plutonium beyond 40 MT.

Thus, DOE has not presented a disposition option for the other 21.5 MT of plutonium declared surplus (and beyond the 40 MT now being planned to be sent to WIPP) and seems to prefer that it not be mentioned. In the EIS, DOE must reveal the long-term plan for the management and disposal of that 21.5 MT. If 61.5 MT of surplus plutonium were to be sent to WIPP (or to a second repository), this would be on top of the 4.5 MT in WIPP from Rocky Flats and other DOE sites, meaning that the real goal could be to get 66 MT of plutonium into a TRU dump.

Note that the US report to the International Atomic Energy Agency (IAEA) about plutonium management, in IFCIRC 549 of October 14, 2022 -

<https://www.iaea.org/sites/default/files/publications/documents/infcircs/1998/infcirc549a6-24.pdf> - states that 4.5 MT of plutonium “has been disposed to waste after termination of safeguards.” This means that 4.5 MT of weapon-grade plutonium from Rocky Flats, and some from Hanford or other sites, has been processed for disposal in WIPP and thus safer to handle from a security perspective. (Also see this International Panel on Fissile Materials blog on amounts of plutonium sent to WIPP:

[https://fissilematerials.org/blog/2016/09/disposition\\_of\\_plutonium\\_.html](https://fissilematerials.org/blog/2016/09/disposition_of_plutonium_.html))

In conclusion, disposal of SRS plutonium in WIPP did not start in 2023 but began in 2013 or earlier, stimulated by a 2011 decision. And, well before 2011, WIPP had already received a large quantity of DOE plutonium. Now, does DOE intend, if the plutonium-disposal program is ever finished, to dump 66 metric tons of surplus plutonium in WIPP (or another TRU facility)? We’ll see what the New Mexico Environment Department, Congress, technical challenges and the public have to say about that.

Stay tuned over the next 240,000 years for updates.

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