

Originating Committee: CaRM/LIDS

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Version #: Rev. 4

Date Revised: [04/22/2024]

Color: Pink Yellow Green Buff Purple Blue Goldenrod

Letter Heading:

To: [Names, titles, and organizations, as appropriate]

Subject: Comprehensive planning for disposition of Hanford’s Transuranic Waste

Summary:

There is material classified as transuranic/transuranic mixed (TRU/M) waste at the Hanford site which currently has only one legal disposal pathway. The disposal facility for all the TRU/M waste in the country is the Waste Isolation Pilot Plant (WIPP) in New Mexico. A ten-year extension (Revision 10) of the WIPP Hazardous Waste Facility Permit (HWFP) ends in 2032. U.S. Department of Energy (US DOE) anticipates additional extensions through the 2070s. The WIPP Permit renewal calls on each US DOE- Environmental Management (EM) site to define “legacy waste,” which will be incorporated into the emplacement of Panel 12, if practicable. The Carlsbad Field Office has requested Citizen Advisory Boards - such as this one - to provide advice related to legacy waste. There currently is not a holistic guideline to ensure that all of Hanford’s TRU/M can get to WIPP before it closes. The Hanford Advisory Board (HAB) believes holistic guidelines should be incorporated in a Tri-Party Agreement (TPA) milestone to develop a TRU/M System Plan.

Cleanup sites and the weapons complex are competing for disposal space at WIPP. The Board is concerned that there is not a clear disposal plan for the portion of Hanford's TRU/M waste that is excluded from the M-091 milestone series. In addition, the Board is concerned that WIPP will not be able to accept all of Hanford's TRU/M waste either because of timing or capacity. Due to these concerns and the long lead time for siting a new disposal facility, the Board is advising the TPA agencies or the DOE-RL/ORP offices to:

- Develop a comprehensive strategy for transuranic and mixed transuranic wastes, including those not addressed under the M-091 milestone. Having a more refined plan will allow cleanup to progress with safe interim storage and will ensure that WIPP has the information it needs to fit all of Hanford’s transuranic and mixed transuranic into its schedule
- Following completion of the plan, the Board advises the TPA agencies to evaluate whether additional retrieval milestones for transuranic and mixed transuranic not covered by the M-091 Milestone series are needed
- Define “legacy waste” as all TRU/M waste remaining at Hanford, including pre-1970 potential TRU/M

- Request that US DOE-EM pursue a transparent and equitable process to identify additional repository locations for transuranic and mixed transuranic waste.

Background:

Given the nature of the processes that created waste at Hanford, there are several waste types that cannot legally be disposed in shallow landfills. Of the wastes that must be transported off site for disposal, only TRU/M has a legal repository. *TRU waste is radioactive waste that, without regard to source or form, is contaminated with alpha-emitting TRU radionuclides having atomic numbers larger than 92 and half-lives longer than 20 years in concentrations greater than 100 nanocuries per gram of waste.* (1) [Update with DOE's definition]. These wastes, generally consisting of contaminated soil, protective clothing, tools, and equipment, can currently be disposed at WIPP which is outside of Carlsbad, NM (2).

WIPP is constructed in a self-sealing massive 2,000-foot-thick salt deposit approximately half a mile below the ground surface. Congress authorized construction of WIPP in 1979, and the facility was certified by the U.S. Environmental Protection Agency (US EPA) in 1998. WIPP is permitted to receive only TRU/M solid waste. The WIPP Hazardous Waste Facility Permit (HWFP) specifies that spent nuclear fuel, waste classified as high-level waste, and transuranic wastes from tanks in Hanford tank farms cannot be disposed at WIPP (3).

The WIPP HWFP has been regularly extended with the cooperation of federal and state permitting agencies. Currently US DOE anticipates WIPP will remain open until 2050, or into the 2080s. However, the anticipated closure estimate of the facility varies depending on state permitting, waste volume limits, and potential expansion. The current (Revision 10) HWFP for WIPP anticipates that the last waste will be disposed in 2032 (3). There is every indication that the operating permit will continue to be revised until the disposal facility reaches its capacity.

TRU/M at Hanford is separated into "retrievably stored" and "pre-1970" potential mixed waste, the difference being when the waste was containerized and staged for disposal. There is also transuranic waste that is not mixed with hazardous material which may be retrievably stored or pre-1970. Waste that was staged after 1970 is considered retrievably stored. This post-1970 waste is subject to the M-091 milestone package (4) and has an enforceable transportation schedule to WIPP between 2028 and 2050. *The scope of the M-091 Milestone series [...] is to complete retrieval and eliminate the backlog of Hanford Site mixed low-level waste (MLLW) and transuranic mixed (TRUM) waste in storage* (4). Estimated volumes of retrievably stored and potential mixed waste at the Hanford site are presented in a Transuranic Mixed and Mixed Low-Level Waste Project Management Plan (5) generated annually as part of the M-091 milestone. In addition to the estimated 12,000 m³ of retrievably stored TRU/M subject to the M-091 milestones, there is also

estimated to be approximately 45,000 m³ of potential CERCLA TRU/M outside of tank farms that has no enforceable disposal schedule. There is low confidence in the estimate of potential CERCLA TRU/M, as much of the material is associated with waste site cleanups and there is uncertainty as to how much of it will meet the definition of TRU/M once it is excavated. There is additional potential transuranic waste not mixed with hazardous materials which is not included in the PMP (6). Characterization, decision, and excavation of the potential TRU/M wastes will take decades, which is compounded by the three-year federal budgeting process. Any transuranic and mixed transuranic waste not sent to WIPP before it closes will be orphaned at the Hanford site until the federal government establishes, constructs, and permits an additional disposal facility.

The promise of Hanford's transuranic and mixed transuranic disposition at WIPP has recently been highlighted by discussions and decisions between federal and New Mexico government agencies. US DOE and the National Nuclear Security Administration (NNSA) are planning to "down-blend" up to 50 metric tons of surplus plutonium for eventual disposal at WIPP (7). Down-blended material could require four shipments to WIPP a week, totaling more than 3,800 total shipments between 2024 and 2049 (8). Hanford's TRU/M waste delivery schedules will compete with NNSA shipments. In addition to using much of the permitted volume of the facility, NNSA shipments will limit the amount of waste that WIPP can process. The remaining TRU/M waste will stay at Hanford until a pathway for disposal is identified. It poses a significant risk to the site if 45,000 m³ or more of the remaining TRU and Mixed TRU, which does not currently have a milestone, remains at Hanford. In 2020, the National Academy of Sciences estimated that the total volume of TRU/M waste that is destined for disposition at WIPP exceeds the Land Withdrawal Act statute limit by 10-50% (8). US DOE has not presented a transparent plan to solve this problem. Revision 10 of the WIPP HWFP did provide an opportunity to minimize the risk of orphan TRU/M waste at EM sites. If practicable, the WIPP HWFP calls for emplacement of "legacy waste" in panel 12 of WIPP. The WIPP HWFP directs the US DOE Carlsbad Field Office to coordinate with each EM site as it defines "legacy waste" with advice from stakeholders, including boards like the HAB (10).

Advice:

Safe removal, treatment (immobilization) and disposal (RTD) of transuranic and mixed transuranic waste is consistent with the HAB's core values.

Offsite geologic disposal of the Hanford transuranic and mixed transuranic waste is uncertain due to license renewals and permitting. The Board is concerned that a portion of the Hanford transuranic and mixed transuranic waste may remain orphaned at the site. With that concern in mind, the Board recommends:

1. The Board advises the TPA agencies to refine the best estimate of retrievably stored and pre-1970s potential transuranic and mixed transuranic quantities presented in the Project

Management Plan (PMP) to outline a framework for a “TRU Waste System Plan.” New Milestones covering the system plan should include discussion of already retrieved wastes, retrievably stored waste, and potential transuranic and mixed wastes generated pre-1970. The TRU Waste System Plan should be provided to the Carlsbad Field Office, and portion can serve as Hanford’s Legacy Waste Plan, as requested by the WIPP Permit. The US DOE Hanford office should consider including estimates for the volume of TRU, excluding the container it is stored in to be consistent with the nomenclature at WIPP.

2. Following completion of the plan, the Board advises the TPA agencies to evaluate whether additional retrieval milestones for transuranic and mixed transuranic not covered by the M-091 Milestone series are needed, as presented in HAB advice 154 (11) and 231 (12).
3. The Board advises the TPA agencies to define “legacy waste” at Hanford as all known or suspected transuranic and mixed transuranic at the site, which would give “Panel 12” priority to production waste over down-blended plutonium if practicable.
4. The Board advises the US DOE Hanford office to request that US DOE-EM pursue a transparent and equitable process to identify additional repository locations for transuranic and mixed transuranic waste.

References:

1. <https://wipp.energy.gov/library/CRA/BaselineTool/Documents/Appendices/EMP.PDF> THE WASTE ISOLATION PILOT PLANT LAND WITHDRAWAL ACT as amended by Public Law 104-201 (H.R. 3230, 104th Congress)
2. <https://www.env.nm.gov/hazardous-waste/wipp-permit-page/>
3. <https://pdw.hanford.gov/document/AR-07648>
4. Project Management Plan – HNF-19169 Rev 25 <https://pdw.hanford.gov/document/AR-25062>
5. Presentation from 2010 COTW: <https://www.yumpu.com/en/document/view/22161870/20101005-swbg-cotws-tpa-presentations-hanford-site>
6. https://www.srs.gov/general/news/factsheets/srs_plutonium_blend_down.pdf
7. <https://doi.org/10.17226/25593>
8. <https://www.ans.org/news/article-4576/new-mexico-tightens-restrictions-on-wipp-permit-renewal/>
9. <https://wipp.energy.gov/Legacy-TRU-Waste-Disposal-Plan.asp>
10. HAB Advice #154: https://www.hanford.gov/files.cfm/HAB_Adv-154.pdf
11. HAB Advice #231: https://www.hanford.gov/files.cfm/HABAdv_231.pdf

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- Brian Vance, DOE
- Stephanie Schleif, ECY
- David Einan, EPA
- Lindsay Somers, DOE
- Roberto Armijo, EPA
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Site-Specific Advisory Boards

- Savannah River Site Citizens Advisory Board
- Nevada Site Specific Advisory Board
- Northern New Mexico Citizens Advisory Board
- Paducah Citizens Advisory Board
- Oak Ridge Site Specific Advisory Board
- Idaho Cleanup Board
- Portsmouth Site Specific Advisory Board
- Kelly Snyder, DFO

OR/WA Congressional Delegations (to Chief of Staff)

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Write-in/Additional

- Mr. JR Stroeble, Carlsbad Field Office
- Dr. Justin Marble, Office Director, National TRU Program, DOE-HQ
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Individuals Requesting to Receive Advice

- Jessica Keys, Staff to Sen. Jeff Merkley