

Response to Comments on the Department of Energy Replacement Panels Planned Change Request for the Waste Isolation Pilot Plant

40 CFR Part 194

Summary of Public Comments and Responses

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Introduction

This document contains a summary of and responses to public comments on the U.S. Environmental Protection Agency (EPA, or the Agency) review of the U.S. Department of Energy's (DOE, or the Department) planned change request to dispose of defense transuranic (TRU) waste in replacement panels 11 and 12 in the Waste Isolation Pilot Plant (WIPP). After conducting a thorough review of DOE's supporting documentation, the Agency concluded that there is a reasonable expectation that the 12-panel disposal system represented in DOE's Planned Change Request (PCR) will comply with the standards and requirements in 40 CFR parts 191 and 194. Thus, EPA approved DOE's PCR to use replacement Panels 11 and 12 at the WIPP repository for the disposal of defense TRU radioactive waste.

Background

On March 14, 2024, EPA received a PCR from DOE per 40 CFR 194.4(b)(3) seeking the Agency's approval to add two replacement waste panels west of the current repository. These two panels, 11 and 12, will be constructed to recover waste disposal volume lost in panels 7 and 9 due to the 2014 radiological release that contaminated the south end of the repository. Additionally, panel 1 was not completely filled due to ground control issues arising from being kept open so long before waste was emplaced. DOE calculated that 1.7 panels of waste volume will be needed to replace this lost volume, rounded up to two panels for construction. DOE also stated that with the addition of the two replacement panels, the WIPP will not exceed the Land Withdrawal Act (LWA) waste disposal volume limit.

The PCR, which DOE refers to as the Replacement Panels Planned Change Request or RPPCR, contained a Performance Assessment (PA) that DOE conducted to support a demonstration that the repository will continue to meet the numeric release limits in EPA's disposal regulations for the WIPP. As part of the PA, DOE calculated releases based on a repository design of 19 panels, which DOE anticipates will be the ultimate WIPP repository configuration at the time of closure. However, with this PCR, DOE was only seeking EPA's approval of the two replacement panels and provided documentation to address the two replacement panels within the context of the 19-panel design.

The Agency evaluated DOE's 19-Panel RPPCR PA and supplementary information submitted by DOE in response to information requests from EPA. After further consideration, EPA requested a PA using a 12-panel configuration to supplement the information already provided (docket ID EPA-HQ-OAR-2024-0309-0053, November 26, 2024). On February 20, 2025, DOE submitted the requested 12-panel analysis (docket ID EPA-HQ-OAR-2024-0309-0049), which included the original ten panels and the two proposed replacement panels, to EPA, labeling it a sensitivity study. After conducting a thorough review of DOE's supporting documentation regarding its 12-panel sensitivity study, EPA generally agreed with DOE's approach and interpretation of the PA results. The Agency's review of the 12-panel analysis is documented in EPA's Review of DOE

Replacement Panels Planned Change Request - Part 1: Review of DOE 12-Panel Sensitivity Study, docket ID EPA-HQ-OAR-2024-0309-0059.

Public Comments

EPA held an informal, virtual public meeting on Thursday, December 7th, 2023, to provide information and provide an early preview of the PCR prior to DOE's formal submission. EPA and DOE used this opportunity to gather preliminary questions/comments/feedback from the public.

On July 16, 2024, EPA published a notice in the Federal Register seeking public comment on the PCR. EPA then held a series of stakeholder meetings in New Mexico (Carlsbad and Santa Fe) during the week of August 26, 2024, to meet with the public and discuss DOE's PCR. The purpose of these meetings was to gather comments from members of the public on the PCR and to provide a facilitated forum for clarifying questions. Staff from DOE and the New Mexico Environment Department (NMED) were also in attendance. Material presented at these meetings and video recordings have been uploaded to the EPA WIPP website.

EPA's initial review of the PCR was based on the 19-panel RPPCR PA submitted by DOE in February 2024. This was the PA discussed at the public meetings in New Mexico in August 2024, and most of the written public comments were also based on this PA. As noted above, the Agency determined the 19-panel RPPCR PA was not providing the information EPA needed to fully evaluate panels 11 and 12 and requested the 12-panel PA calculations. The public comment period was extended to June 2, 2025, to capture additional public comments on the updated PA and DOE's responses to EPA's comments and questions. As mentioned in Section III of the Federal Register notice announcing EPA's decision, while EPA has reviewed all of the public comments on the RPPCR, only those relevant to the 12-panel PA are considered within the scope of this PCR decision. Comments that pertain solely to the 19-panel RPPCR PA are considered outside the scope but will be retained by EPA and addressed in a subsequent report relevant to future actions taken by DOE.

The Agency received 33 written comments via the public docket, and one comment received outside of the docket that the Agency committed to addressing. The comments submitted to the docket were a mix of unique comments as well as written versions of verbal comments delivered at the public meetings. All verbal comments were captured by written comments.

This document is organized into three sections. The first section addresses comments regarding the significance of DOE's proposed change and whether it requires EPA to conduct its review and decision through a notice-and-comment rulemaking. This issue was of high interest to stakeholders.

The second section addresses technical comments on the PCR and those that are relevant to the supporting 12-panel PA.

The third section addresses comments that EPA considers to be outside the scope of this decision. These comments include technical comments on the RPPCR PA that are relevant to the projected panels 13-19 but are not an issue for the two replacement panels 11 and 12. Those comments will be addressed in a subsequent document that will be part of the overall record for the RPPCR review.

Following Section 3 is a listing of all commenters on the RPPCR, identified by their respective submittals to docket EPA-HQ-OAR-2024-0309. Throughout the responses, individual commenters on different issues are noted to further inform the reader.

Section 1: PCR Significance and Whether the Decision Requires a Rulemaking

Many commenters expressed the view that EPA's review process for the Replacement Panels Planned Change Request (RPPCR) must take place through a notice-and-comment rulemaking because the addition of two new waste panels, coupled with other changes to repository operations and the performance assessment, "depart significantly from the previous compliance application." In addition to individual comment submittals and statements at public meetings, a number of interested organizations jointly sent letters directly to EPA outlining the reasons for this position. The relevant provision is located in 40 CFR 194.65(a):

If the Administrator determines that any changes in activities or conditions pertaining to the disposal system depart significantly from the most recent compliance application, the Agency will publish a Notice of Proposed Rulemaking in the Federal Register announcing the Administrator's proposed decision on modification or revocation, and soliciting comments on the proposal.

The Agency disagrees that a rulemaking is necessary for this decision. The Administrator has discretion in reaching a determination regarding whether the changes described in the RPPCR "depart significantly from the previous compliance application." After careful consideration, the Agency declines to determine that the RPPCR represents a significant departure from the previous compliance application (the 2019 Compliance Recertification Application or CRA-2019), for the following reasons:

- The two replacement panels are primarily intended to replace disposal capacity lost to the 2014 radiation release incident, which prevented the full use of Panel 7 and the planned use of Panel 9, as well as capacity in Panel 1 that was not utilized in the early phase of emplacement as a result of ground control issues stemming from scheduling of shipments, and therefore the new configuration represents a disposal capacity comparable to that analyzed for the CRA-2019;
- The two new waste panels are of a similar size and design to the existing eight panels described in CRA-2019;
- A 1987 Time-Domain Electromagnetic (TDEM) geophysical survey of the WIPP site provided estimates of the depths of brine reservoirs that may be present beneath the ten original WIPP waste panels. DOE reexamined the existing TDEM data and found that it also adequately covers the area of replacement Panels 11 and 12. Therefore, no new data needs to be collected for these two replacement panels. DOE modeled the probability that a borehole may encounter a pressurized brine pocket in the RPPCR as being the same as in CRA-2019. Upon reviewing these data, EPA accepted DOE's conclusion that the current site characterization data already covers the repository footprint, including panels 1-10 and 11-12, and agreed with DOE not to change the probability of encountering a pressurized brine pocket in RPPCR;
- The types of waste that will be emplaced in the replacement panels are expected to be similar to those analyzed for the CRA-2019. A stated public concern is the amount of surplus

plutonium waste that gets disposed in the two new panels. While a limited amount of down-blended surplus plutonium is being emplaced in the repository, much of the surplus plutonium designated for the “dilute and dispose” method, as well as plutonium waste from potential new pit production, would need to go in any additional future panels beyond the two panels currently being requested by DOE;

- DOE’s performance assessment for the 12-panel repository, confirmed by EPA’s independent sensitivity study, shows limited change in releases and release paths from those described in the CRA-2019 and the total mean release is under the EPA regulatory limits;
- The New Mexico Environment Department approved the two new panels in the site permit after an extensive review process that included public comment.

Further, EPA has provided significant opportunity for public review and comment, comparable to a rulemaking process. All submittals by DOE, including responses to questions from EPA, have been posted in the regulatory docket and on EPA’s WIPP website. The comment period was kept open for more than 9 months to ensure the public’s ability to review all of the relevant documentation, and this response to comments document has been prepared to show how comments were considered, as would be done for a formal rulemaking.

The remainder of this section addresses individual issues that were raised to support the view that the RPPCR departs significantly from the previous compliance application and therefore a rulemaking is required. While many commenters generally expressed support for a rulemaking, the more detailed statements addressed in this section were provided by Commenters 0008, 0009, and 0019.

Issue 1.A: EPA Previously Stated that a Rulemaking Would be Necessary

Summary of Comments under Issue 1.A:

Commenters note that EPA’s April 20, 2021, letter to DOE [docket ID EPA-HQ-OAR-2024-0309-0013] contained the following statement:

EPA staff interpret the information available so far as indicating that new waste disposal panels constructed in previously undeveloped areas likely would depart significantly from the most recent compliance application and would likely require a rulemaking.

Commenters conclude that EPA established a public expectation that a rulemaking would be conducted and is therefore obligated to fulfill that expectation.

Response to Issue 1.A:

The Agency notes the key phrasing in the excerpted statement above as “the information available so far.” For example, at the time the letter was written, EPA was unaware of any site characterization data for the area designated for the two proposed new panels. Further, DOE had not indicated in any previous interactions where this issue had been raised that such data

had been collected. Subsequent to the April 2021 letter, DOE did identify that it had collected relevant and qualified data through earlier efforts that provided a solid foundation for characterizing the new area to be excavated, in particular, the potential for pressurized brine pockets.

The availability of such information relieved a significant concern that it would be necessary for DOE to design studies, collect the information, then formally review and qualify that information to translate it into the performance assessment. Instead, DOE was able to rely on data for the RPPCR PA that was directly comparable to that used in previous PAs. As discussed above, the 1987 TDEM geophysical survey of the WIPP site adequately covers the area of replacement Panels 11 and 12. Therefore, no new characterization data needs to be collected for these two replacement panels. DOE modeled the probability that a borehole may encounter a pressurized brine pocket in the RPPCR as being the same as in CRA-2019. Upon reviewing these data, EPA accepted DOE's conclusion that the current site characterization data already covers the repository footprint, including panels 1-10 and 11-12, and agreed with DOE not to change the probability of encountering a pressurized brine pocket in the RPPCR.

[Issue 1.B: DOE acknowledges that the RPPCR “departs significantly from the previous compliance application”](#)

Summary of Comments under Issue 1.B:

Commenters point out that DOE's March 12, 2024, transmittal of the RPPCR to EPA stated that the request was being made “[p]ursuant to [40 CFR] 194.4(b)(3)” and the RPPCR itself also cites this provision. This provision states that

Any time after the Administrator issues a certification, the Department shall report any planned or unplanned changes in activities or conditions pertaining to the disposal system that differ significantly from the most recent compliance application.

Commenters conclude that DOE has determined that the RPPCR is significant enough to warrant a rulemaking by EPA and the Agency should defer to DOE's judgment.

Response to Issue 1.B:

By rule it is the Administrator who determines whether a rulemaking is necessary, not DOE. EPA notes that the March 12, 2024, RPPCR transmittal letter also states that “Pursuant to 40 CFR 194.65(a), the DOE maintains that the RPPCR-PA is *not* a significant departure from Compliance Recertification Application (CRA)-2019” (emphasis added). Further, DOE submittals of previous PCRs also reference 40 CFR 194.4(b)(3); for example, on April 25, 2023, DOE notified EPA of the addition of four shielded container variants as new payload containers “per the requirements of 40 [CFR] 194.4(b)(3)(i).” The Agency determined that the limited impact of that requested change did not warrant public comment, much less a rulemaking.

This practice has similarly been followed by DOE since the earliest time of WIPP operations. DOE's proposal to receive and dispose of remote-handled waste was submitted to EPA "as required by 40 CFR §194.4(b)(3)". The Agency did not conduct a rulemaking but approved this change administratively. See docket ID EPA-HQ-OAR-2003-0177-0204. Thus, reference to §194.4(b)(3) is not determinative of the need for a rulemaking.

Issue 1.C: The RPPCR does not just address two new panels, but also includes proposed Panels 13-19

Summary of Comments under Issue 1.C:

Commenters note that DOE submitted a PA only for a 19-panel repository, at the request of EPA, and suggest this is indicative of a more far-reaching Agency decision. They point to questions in which EPA asked DOE for additional information or clarification on the assessed performance of the prospective 19-panel repository and infer that this is the focus of the Agency's review.

Response to Issue 1.C:

With this PCR, DOE is only seeking EPA approval for the two replacement panels. DOE must submit a separate request for approval of any additional panels beyond replacement panels 11 and 12.

In its April 20, 2021, letter to DOE, EPA stated that "DOE should, to the best of its ability, submit for EPA review information that represents the state of the repository at the time of closure." Further, "[t]he repository design at closure is important for representing the disposal system in the modeling required for compliance." The Agency recognizes that it may not have been sufficiently clear about providing this "time of closure" view of the disposal system as a supplement to the information specific to the request for approval of two new panels. Regardless, DOE interpreted EPA's request by addressing a repository projected to include additional panels that would be needed to accommodate the full projected waste inventory, beyond the two that were the subject of the request.

The Agency reviewed the 19-panel RPPCR PA to the best of its ability, as well as a supplemental analysis provided by DOE that attempted to capture the performance of the 12-panel repository within the 19-panel PA. Ultimately, EPA determined that it was unable to make a decision on the two requested new panels without a 12-panel PA, which DOE provided in February 2025. That 12-panel analysis is the basis for the EPA's decision. The 19-panel analysis provides insights into potential future needs and identifies several issues that the Agency believes will need to be addressed if DOE requests approval of the projected additional panels. However, comments that are applicable only to the analysis of projected panels 13-19 are considered to be outside the scope of this decision and will be addressed in a separate document on EPA's review of the 19-panel RPPCR PA. See Section 3 of this document.

Issue 1.D: The waste inventory is expanded in both volume and type of waste

Summary of Comments under Issue 1.D:

Commenters note the inclusion in the RPPCR of additional plutonium wastes, including both pit production wastes and surplus plutonium designated for “dilution and disposal.” Commenters rightly point out that no pit production is projected to take place for several years at least, so inclusion of this waste is speculative at best. Commenters also find a lack of clarity surrounding the amount of surplus plutonium projected for disposal at WIPP.

Response to Issue 1.D:

As noted above in the response to Issue 1.C, DOE’s 19-panel RPPCR PA was intended to represent the projected state of the repository at the time of closure. The inventory and proportion of plutonium wastes in the 12-panel repository is expected to be more aligned with the previous CRA-2019, incorporating only limited amounts of surplus plutonium. The majority of surplus plutonium, along with any pit production wastes, would be destined for future waste panels for which DOE would have to submit a separate PCR.

The two new panels are intended to replace planned capacity that is no longer available for waste emplacement. The modeled waste inventory for the 12-panel configuration is based on the CRA-2019 inventory.

Issue 1.E: Numerous other changes render the RPPCR a “significant departure” from CRA-2019

Commenters note that DOE identifies 16 specific changes from the CRA-2019 affecting conceptual models, modeling approaches, and modeling parameters, in addition to the waste inventory and two new panels. Commenters believe that some of these individual changes are sufficiently significant to warrant a rulemaking, but the combined effect should compel Agency action. See PCR Enclosure 1, page 12.

Response to Issue 1.E:

The Agency discusses many of these topics in the “EPA Review of DOE Replacement Panels Planned Change Request Part 1: Review of DOE 12-Panel Sensitivity Study” and other sections of this document. Regarding conceptual models, EPA analyzed the Additional Panels Performance Assessment (APPA) Peer Review conducted by DOE beginning in July 2021 and found that the peer review adequately considered the proposed changes, and its conclusions were reasonable and appropriate. In considering the changes of Disposal System Geometry, Repository Fluid Flow, and Direct Brine Release conceptual models, and the implementations of those changes into the WIPP performance assessments in the context of the RPPCR, the Agency has determined that they are not sufficiently significant to warrant a rulemaking. See docket ID EPA-HQ-OAR-2001-0012-0074 for EPA’s evaluation of the APPA peer review.

Regarding other aspects of the performance assessment, the Agency continues to have concerns regarding certain representations and parameter values used in the CRA-2019 PA (see docket ID EPA-HQ-OAR-2019-0534-0043 for a summary and docket ID EPA-HQ-OAR-2019-0534-0049 for more detailed discussion), and as a result, does not accept the CRA-2019 PA, on its own, as an adequate baseline for the RPPCR 12-panel PA. However, the Agency has conducted

sensitivity studies to evaluate the impacts of the parameters and assumptions in question and concludes that the WIPP will continue to comply with EPA's disposal standards in 40 CFR part 191. In addition, several of the changes identified by DOE in the initial RPPCR are more relevant to the notional panels 13-19, and the Agency's review of those changes will be addressed in a separate document. See also Section 3 of this document.

Section 2: Comments related to technical issues of the RPPCR

Issue 2.A: Future Plutonium Disposal

Summary of Comments under Issue 2.A:

A number of commenters (e.g., 0014, 0015, 0016, 0018, 0019, 0020) expressed concern or opposition to the DOE/National Nuclear Security Administration (NNSA) proposal to include surplus Pu waste streams in the inventory for the new panels. Surplus plutonium wastes include those derived from the weapons program that are designated for the “dilute and dispose” approach through down-blending with inert materials. Commenter 0016 wrote that “...We do not believe WIPP has the statutory authority to accept waste other than TRU waste. We abhor NNSA's attempt at a slight-of-hand trick to finesse its way into qualifying plutonium-laden residue, not trace amounts of TRU waste, for admission to the WIPP” (EPA-HQ-OAR-2024-0309-0016, page 5). The same commenter also wrote that “surplus plutonium is significantly different in other respects. Surplus plutonium is proposed to use a classified adulterant. Surplus plutonium would be in different waste containers, at least in some cases. It is a fact that surplus plutonium was not considered in the WIPP Authorizations of 1979 and 1992, as surplus plutonium was only first declared by President Clinton in 1994. Most surplus plutonium is not currently TRU waste. WIPP is limited to defense TRU waste, so such non-TRU waste cannot be included in the PCR Inventory.”

Commenter 0015 was concerned about the characterization and criticality concerns around the surplus Pu: “Regarding nuclear criticality, the EPA’s regulations may have been acceptable before but certainly are not adequate for disposal of surplus plutonium. The EPA regulations allow a high probability of nuclear criticality at WIPP, and by the way, are also inadequate for other repositories. The criticality risks for concentrated fissile material such as in surplus plutonium or spent nuclear fuel persist far beyond 10,000 years. The EPA regulations only address criticality for 10,000 years and allow criticality to be dismissed with quantitative hand-waving.”

Response to Issue 2.A:

EPA is not amending its regulations as part of this action. As discussed above, the inventory and proportion of plutonium wastes in the 12-panel repository is expected to incorporate only limited amounts of surplus plutonium, consistent with what was documented in the 2019-CRA. The WIPP Land Withdrawal Act (LWA) allows for disposal of 6.2 million cubic feet of defense related TRU waste, which is defined in Section 2.(18) of the statute. DOE established specific waste acceptance criteria (WAC)¹ for the facility. Wastes that do not meet the WAC are not allowed to be disposed of at WIPP. The surplus Pu intended for disposal in the replacement waste panels has been determined by DOE to be defense transuranic waste. Similar forms of

¹ https://wipp.energy.gov/library/wac/DOE-WIPP-02-3122_Rev11_Final_SOF.pdf

down-blended Pu in smaller amounts have already been emplaced at WIPP in the existing waste panels. EPA has conducted multiple inspections of the down-blended waste characterization process and will continue to do so. EPA has found DOE's waste characterization system of controls for the down-blended plutonium to be adequate. See, e.g., docket ID EPA-HQ-OAR-2001-0012-0501.

Issue 2.B: Plutonium Pit Production

Summary of Issue 2.B:

A number of commenters (e.g., 0014, 0015, 0019, 0020) mentioned that proposed waste streams from future NNSA pit production were not TRU wastes and should not be acceptable for disposal at the WIPP. Commenter 0026 stated that because pit production is associated with the current nuclear weapons program, that the WIPP should not be used to support future production of weapons.

Response to Issue 2.B:

Plutonium pit production waste is not specifically addressed in this PCR decision. For reasons similar to those discussed above in Issue 2.A, it is likely that the bulk of future pit production wastes would be destined for future waste panels for which DOE would have to submit a separate PCR.

DOE is responsible for determining whether waste is eligible for disposal at WIPP. DOE provides information to EPA that the different waste streams are eligible for disposal at the WIPP, i.e., that the waste is defense-origin, transuranic and not spent nuclear fuel or high-level waste.² EPA regulations in 40 CFR part 194 require that DOE establish a system of controls capable of ensuring that waste is properly characterized for disposal at the WIPP; EPA's oversight program focuses on verifying that the system of controls is properly documented and implemented. By law, the Department of Energy's National Nuclear Security Administration (DOE/NNSA) is mandated to manufacture no fewer than 80 reserve pits annually by 2030. [Title 50 United States Code (U.S.C.) 2538a] Recently, DOE/NNSA announced its intention to prepare a Programmatic Environmental Impact Statement (PEIS) for plutonium pit production, as published in the Federal Register on May 9, 2025. [FR Doc. 2025-08140] This PEIS will include a preliminary environmental analysis of the impacts on waste management activities and capacities at both on-site and off-site locations. As mentioned in response to a previous comment, DOE has established WAC for the facility under the LWA. Any waste that does not meet these criteria cannot be disposed of at the WIPP and must be redirected to another facility or retained by DOE/NNSA. Waste from pit production intended for disposal in new panels must comply with the WIPP WAC and will be subject to waste characterization and

² See the WIPP LWA as amended by Public Law 104-201, Sections 2.(18), 2.(19), and 12.

quality assurance inspections by EPA to ensure it is suitable for disposal at the WIPP. Waste from previous pit production has already been emplaced in WIPP.³

Issue 2.C: Legacy TRU and recognizing NMED permit conditions

Summary of Comments under Issue 2.C:

Several commenters (e.g., 0016, 0019) mentioned the concept of legacy TRU wastes, and that the WIPP was only approved and authorized for the disposal of legacy TRU wastes. Some commenters define legacy TRU as wastes produced during the Manhattan project, while other have defined legacy TRU as wastes before the opening of the WIPP in 1999. All of the commenters on legacy TRU want EPA to establish a definition of legacy TRU.

Commenters 0016 and 0019 have requested that EPA include provisions in any PCR approved for the prioritized cleanup of legacy TRU wastes before newer generated wastes are disposed of. These commenters specifically reference TRU wastes at Los Alamos National Laboratory (LANL) as wastes that should be prioritized for any new waste panels. Commenter 0019 wrote “Specifically, EPA should require prioritization of legacy waste to be emplaced in panels 11 and 12. This prioritization is consistent with federal laws, is important to the State of New Mexico and the public, and was agreed to by DOE and SIMCO. Thus, there is no basis to not include such a condition.”

Commenter 0042 requested that “approval of new disposal panels by EPA should recognize the requirement to prioritize legacy waste disposal in Panel 12 to the extent practicable pursuant to this new permit condition.”

Response to Issue 2.C:

EPA is not establishing a definition of legacy TRU waste because the WIPP LWA and EPA’s regulations do not explicitly use or define “legacy TRU waste” and such a definition is not needed to support the Agency’s decision. Depending on the progress and status of waste cleanup and waste generating activities, different waste generator sites (e.g., National Labs) use and define the term “legacy TRU waste” in slightly different ways. A recent report called “Legacy TRU Waste Disposal Plan” from DOE’s Carlsbad Field Office, dated November 2024 (<https://wipp.energy.gov/Legacy-TRU-Waste-Disposal-Plan.asp>), submitted pursuant to a State of New Mexico permit condition, provides more detail and documents activities and plans to continue to prioritize the disposal of legacy wastes at WIPP. The State of New Mexico continues to lead the discussion of the issue with DOE as it exercises its oversight role.⁴ DOE must meet all of the disposal requirements laid out in 40 CFR parts 191 and 194, along with any conditions laid out in the hazardous waste permit issued by the New Mexico Environment Department (NMED). In a May 21, 2025, letter commenting on this draft submittal, the State of New Mexico

³ https://wipp.energy.gov/Library/TRUwaste/ATWIR_2024_DOE-TRU-2024-3425.0_Final.pdf

⁴ See <https://www.env.nm.gov/hazardous-waste/wipp/>

requested that DOE exclude the surplus plutonium waste stream, as well as new pit production wastes, from consideration as legacy waste.⁵

EPA's regulations do not address the sequence of waste emplacement. The aforementioned report "Legacy TRU Waste Disposal Plan" from DOE's Carlsbad Field Office to the New Mexico Environment Department provides some detail regarding what Los Alamos National Laboratory considers legacy TRU waste and prioritizing its disposal at WIPP. One of the agreed upon permit conditions placed on WIPP as part of its 10-year Resource Conservation and Recovery Act (RCRA) permit renewal issued in 2023 was to prioritize and ensure adequate capacity at WIPP to enable the clean-up of waste from sites in New Mexico like Los Alamos.⁶ NMED establishes the conditions for the operational phase of the WIPP within the RCRA permit.

In response to Commenter 0042, EPA recognizes the NMED requirement within the current hazardous waste permit regarding legacy waste prioritization and has noted that in earlier responses.

Issue 2.D: Site Characterization Data

Summary of Comments under Issue 2.D:

Commenter 0018 mentioned that there is inadequate site characterization data for the panels 11 and 12, and that DOE needs to do more site characterization to identify potential unknown brine pockets.

Response to Issue 2.D:

DOE found that the original time domain electromagnetic induction method (TDEM) survey that supported the WIPP Compliance Certification Application and the original repository footprint of Panels 1 through 10 also covered the area over which the two replacement panels 11 and 12 are located. The TDEM survey was used to determine the probability of encountering brine in the underlying Castile Formation, which is then used to develop a parameter (PBRINE) in WIPP PA. EPA closely scrutinized the data and derivation of this parameter and found it suitable for the original repository footprint. For the RPPCR, DOE utilized the existing TDEM data covering the area of the new panels and prior established methods to recalculate PBRINE for the expanded 12 panel repository footprint. EPA found this approach reasonable for the RPPCR. However, EPA anticipates that DOE will need to collect new geophysical or comparable data to evaluate the presence of brine in areas further west of the existing repository footprint not covered by existing TDEM data, including the conceptual panels 13-19, in any future planned change request for EPA to review.

⁵ <https://hwbdocs.env.nm.gov/Waste%20Isolation%20Pilot%20Plant/250514.pdf>

⁶ See Section 4.2.1.4 of the RCRA permit

https://wipp.energy.gov/Library/Information_Repository_A/Searchable_Permit_2items_April2025.pdf

Issue 2.E: Features, Events, and Processes Considered for the WIPP PA

Summary of Comments under Issue 2.E:

EPA received a comment via email but not specifically tied to the RPPCR on the effect of fracking and earthquakes on the performance of WIPP. EPA committed to include a more detailed response to it in this document along with the rest of the public comments. This comment was subsequently added to the docket as Commenter 0055.

Response to Issue 2.E:

Many stakeholders and members of the public have shared concerns regarding WIPP, hydraulic fracturing, and earthquakes, including a number of questions at the August 2024 public stakeholder meetings. Earthquakes, including those related to oil and gas operations, have been monitored for decades in the Permian Basin region, and the risks to WIPP have been evaluated and re-evaluated many times. Seismic activity is included among the features, events, and processes routinely evaluated in WIPP PA. Data continues to be collected, and the available information indicates that earthquakes, whether human-caused or natural, are not capable of generating enough shaking to impact operations at WIPP, nor to damage facilities or the radioactive waste buried there, even far into the foreseeable future. To address the concern in more detail, the discussion below summarizes the various efforts to understand, evaluate, and reduce seismic risks, followed by a brief summary of the science behind earthquakes and hydraulic fracturing.

At the federal level, EPA and DOE are aware of and have looked into this and related issues, along with regulators in New Mexico and Texas. DOE established the Delaware Basin Drilling Surveillance Program (DBDSP) for the WIPP before it opened. (The Delaware Basin is part of the Permian Basin where WIPP is located.) The DBDSP gathers information relating to oil and gas, mining, and other human activities in the Delaware Basin, plus seismicity (earthquakes). DOE also supports New Mexico Tech's Seismological Observatory (NMTSO) to monitor earthquakes in the region, which they report back quarterly to DOE. DOE then shares that data with EPA annually in the Delaware Basin Monitoring Annual Report, which we closely review.

NMTSO has operated a statewide network of seismic sensors starting in the 1970s, including several in southeast New Mexico. This helped establish a "baseline" of seismicity for the region to evaluate the suitability of the WIPP site. The network has been upgraded with new equipment and additional stations around the Delaware Basin. Across the border in Texas, the legislature in 2017 established and funded TexNet, a state-wide, state-of-the-art seismic network. TexNet is operated by the Texas Bureau of Economic Geology (BEG) which is also home to the Center for Injection and Seismicity Research (CISR), a research consortium that studies earthquakes associated with oil and gas operations. Data is shared across these and other seismic networks, and scientific collaboration is ongoing and includes Stanford University and the U.S. Geological Survey (USGS). The Permian Basin is probably one of the most closely studied areas with earthquakes in the U.S. This work has been used to inform and advise

regulators, elected officials, and the public on the risks of earthquakes. For example, based on data collected, regulators in Texas and New Mexico have shut down wells in certain rock layers and depths underground known to be associated with induced seismicity (human-triggered) earthquakes. New rules, monitoring requirements, and protocols have been put in place, including some that prohibit or strictly limit new wells in certain areas and depths, and these are regularly reviewed and revised as necessary.

The following websites have maps and lists of recent earthquakes and more information:

- <https://geoinfo.nmt.edu/nmtso/network/home.cfm>
- <https://catalog.texnet.beg.utexas.edu/>

When the land for the WIPP was set aside by Congress by the WIPP Land Withdrawal Act (LWA), drilling from the surface for resources and mining for potash was prohibited inside the 4 x 4-mile square, and will not be allowed into the foreseeable future, even after the WIPP is closed. This space serves as an institutional control to protect the repository and is one element of the safety design of WIPP. The surface facilities (buildings, hoists, etc.) at the WIPP were designed to withstand the shaking generated by a magnitude (M) 5.5 earthquake directly at the WIPP site. In addition, for facilities located underground (like the waste disposal rooms), the shaking from an earthquake is much weaker than it is at the ground surface.

Earthquake magnitudes are measured using logarithmic scales. For example, the amplitude (height) of the seismic wave recorded of a magnitude 4 earthquake is 10 times higher than for a magnitude 3 event. And in terms of the seismic energy or strength (seismic moment) of the earthquake, it is approximately 30 times greater. There is also a relationship between the magnitude and the frequency (how many) of earthquakes for a given area. For example, if there is one magnitude 4 earthquake in a certain region over a set period of time, one would expect around 10 earthquakes in the magnitude 3 range over that same time and region, 100 magnitude 2s, etc. This robust relationship is used for extrapolating risks and was discovered from natural earthquakes. The mathematical relationship has been shown to be a little different for induced seismicity, but it is in a way that would overestimate risks. In other words, even fewer large earthquakes are observed than would be expected from the number of smaller earthquakes caused by human activities.

The shaking from earthquakes decreases significantly with distance from the source and also depends on the types of rock it goes through. Rock salt, which is what the WIPP underground is excavated in, has unique mechanical properties that make it absorb and reflect more seismic energy than the rocks above and below it. Typically, only when the earthquakes reach the magnitude 5 range does damage to infrastructure on the ground surface become a concern, and the impacts are very localized. The largest recent earthquake in the Delaware Basin in New Mexico was a magnitude 4 in July 2021 that knocked items off shelves near the epicenter but caused little damage. To date, the largest nearby earthquake was magnitude 3.2 located 11 miles east of WIPP in November 2021. Given the relationships described above, that earthquake

would have needed to be even closer and few hundred times stronger (> 2 units of magnitude) to cause any damage to WIPP facilities, and there were no reports indicating it was noticed underground. Earthquakes at the site and how they relate to the operational and long-term performance was discussed at the public meeting in Santa Fe, and can be found in the recording at 1:05:50.⁷

Hydraulic fracturing (“fracking”) is the process of injecting fluids (typically water) with sand mixed in at high pressures into rocks that contain hydrocarbons but lack the permeability (ability for fluids to flow) to produce them. The pressurized water forces open existing fractures and/or creates new fractures in the rock, and the sand fills those fractures to keep them open once and allow the oil and gas to flow faster to the well. As the cracks open up, the “popping” and sliding of the rocks generates a “cloud” of seismicity or very small earthquakes. These mini earthquakes are typically so weak that they can only be detected using sensitive equipment placed underground in a nearby borehole. The length of time and volumes pumped limit how far the water and fracturing can go (typically a few hundred feet), and in most cases, limit the seismicity.

Where they are found underground, oil and gas are nearly always mixed with brine (salty water), which is co-produced or comes out of the well mixed together. At facilities on the surface, oil and gas producers will separate the salt water, collect it, and typically reinject it elsewhere underground using another well because it is too salty to be used for other purposes. Sometimes it is injected into the same rock unit it came from in order to “sweep” or push remaining oil underground to a production well, or to maintain the pressure needed for the rock unit to produce more oil and gas. Today, so much water is co-produced with oil and gas, not all of it can be reused elsewhere in the oil field, so large quantities of salt water are disposed of by injecting it deep underground (known as salt-water disposal or SWD) into other rock layers. These wells are regulated as a specific class under EPA’s Safe Drinking Water Act (SDWA) Underground Injection Control (UIC) Program and subject to strict construction standards and periodic testing. Nearly all of the induced seismicity in the Permian Basin region has been associated with SWD wells and not directly with hydraulic fracturing; however, the increase in oil and gas and water production that has been enabled by techniques including hydraulic fracturing and horizontal drilling has necessitated the construction of many more disposal wells to deal with all of the salt water. Any movement of fluids underground has the potential to trigger earthquakes. But in the case of the Permian Basin, the majority of the induced seismicity, and the largest earthquakes, have been associated with salt-water disposal wells. Most of the earthquakes occur in the very old “basement” igneous and metamorphic rocks that lie beneath the miles-thick sedimentary rocks filling the basins.

One of the challenges when the “shale revolution” hit the Permian Basin in the early 2010s accompanied by earthquakes was a lack of seismic data with adequate resolution to pinpoint

⁷ <https://www.youtube.com/watch?v=C-jeZrGogvg>

exactly where they were occurring, making it hard to link them to particular activities or specific wells. The solution was to add more seismometers and stations to increase the density of the seismic networks in the region, such as Texas's TexNet and New Mexico Tech's WIPP seismic networks. New equipment is more sensitive and sophisticated and allows for nearly real-time monitoring and analysis. Regulators and oil and gas companies now can receive automated alerts, and protocols have been put in place to slow, and even halt oil and gas operations and disposal wells, under certain circumstances. Since around 2022, seismicity appears to be declining in frequency and magnitude, despite ever greater volumes of oil production and salt water injection. Though levels are still elevated compared to previous decades, the decline is evidence that these efforts are working to reduce them.

The northern part of the Delaware Basin where the WIPP is located has few mapped faults in the basement rocks, and the lack of clear patterns in the seismicity is additional evidence for the lack of faults and fractures. Proximity to faults was one key criterion used by DOE in selecting the WIPP site. There are no known active faults that reach the ground surface for nearly 100 miles in any direction from the WIPP.

In short, earthquake risks have been extensively studied at the WIPP site, well before it was constructed, and they continue to be closely monitored and studied. There is no data to suggest that any earthquakes of the magnitude capable of causing any damage at the WIPP can or will occur in the future. Earthquakes pose a very low risk to the WIPP. The fact that the WIPP region has been relatively stable, with respect to geology and tectonics, for a quarter billion years is one of the reasons it was selected to dispose of radioactive waste.

Section 3: Topics Outside the scope of EPA’s review of the RPPCR

Issue 3.A: Other Hazardous Waste Permit Conditions

Summary of Comments under Issue 3.A:

Commenter 0019 mentioned that EPA needed to engage with DOE, NMED, and the public in New Mexico to develop a strategy for further vetting the effects of the dilute and dispose plutonium inventory. The commenter also requested that EPA require that DOE submit to EPA an annual report on DOE’s activities towards siting an additional deep geologic repository, and that EPA require that DOE submit to EPA the Repository Siting Annual Report that will be submitted annually to NMED. The DOE siting report is a condition of the NMED hazardous waste permit renewal.

Commenter 0042 requested that the EPA Office of Enforcement and Compliance Assurance conduct a comprehensive multi-media inspection of the site to ensure compliance with federal and state operating permits.

Response to Issue 3.A:

As indicated by DOE’s “Legacy TRU Waste Disposal Plan,” the bulk of the dilute and dispose inventory will be beyond the disposed waste estimated for panels 11 and 12. Further, as noted above in Issue 2.C, NMED in its comments on the plan indicated that the surplus plutonium waste stream from Savannah River and future pit production waste should not be considered legacy waste. A broader discussion on dilute and dispose would be part of a future request for additional panels and would require additional analysis by DOE. In addition, any request for EPA’s involvement on efforts between DOE and NMED towards an additional deep geologic repository is outside the scope of approving this PCR.

As well, the request to conduct a comprehensive multi-media inspection is outside the scope of approving this PCR. NMED and EPA have had close cooperation on WIPP in the past and will continue to do so in the future. EPA conducts site inspections to ensure compliance with the conditions of the certification. Further, EPA reviews the Biennial Environmental Compliance Report prepared by DOE to demonstrate compliance with environmental statutes, as directed by Section 9 of the WIPP LWA.

Issue 3.B: Disposal of Wastes Other Than TRU

Summary of Comments under Issue 3.B:

Commenter 0012 encouraged the use of WIPP for the disposal of Greater than Class C low-level wastes, as well as similar wastes generated by DOE, stating that “...the facility offers such outstanding isolation of radioactive wastes that its scope should be expanded... To that end, ultimately non-TRU wastes should be considered, such as the Greater-Than-Class-C (GTCC) and

GTCC-like wastes that currently have no path forward, and TRU wastes that are not defense-related.”

Response to Issue 3.B:

The classification of greater than class C (GTCC) low-level radioactive waste is used by the U.S. Nuclear Regulatory Commission⁸ primarily for use in programs under its regulatory authority, or the shared authority given to its Agreement States. The WIPP LWA restricts disposal at the WIPP to defense-origin TRU waste.

Issue 3.C: Comments Specifically Related to Panels 13-19

Summary of Comments under Issue 3.C:

A number of commenters (e.g., 0014, 0016, 0019) mention the inclusion in the RPPCR PA of non-permitted and non-requested panels 13-19.

Several commenters (e.g., 0019, 0020) requested that EPA commit to undertaking a rulemaking for any future DOE request to add additional panels.

Commenter 0015 mentioned that DOE has modified the transmissivity fields (T-fields) for the Culebra Dolomite as part of the transport modeling, and that this would have the effect of lowering releases in the event of a borehole penetration.

Response to Issue 3.C:

During EPA’s review, the Agency specified that panels 13-19 were not pertinent to our decision on the requested panels 11 and 12. EPA requested the separate 12-panel PA to clarify the impacts of the two proposed replacement panels, and that analysis is the basis for their approval. EPA will deal with panels 13-19 when and if DOE submits an additional PCR for these panels. We are also in the process of producing a separate report on EPA’s review of the 19-panel PA, and EPA projects that this will be released later in 2025. Comments related to panels 13-19 will be addressed in that document.

EPA will evaluate each PCR from DOE as it is submitted and will determine based on the submission whether a rulemaking is necessary. The Agency’s actions related to a future PCR from DOE are outside the scope of this PCR.

DOE did make the T-field changes as part of the 19-panel RPPCR PA, and the Agency will be discussing this as part of the separate report that will be released later this year. As part of EPA’s request to DOE for a 12-panel PA sensitivity study, EPA requested PA calculations without the changes to the T-fields, so the T-field changes are not applicable to the approval of the two new panels. This 12-panel PA is the basis of EPA’s RPPCR decision, and any future changes to the modeling will be evaluated by EPA at that time.

⁸ See 10 CFR 61.55.

Issue 3.D: Procedural Issues

Summary of Comments on Issue 3.D:

A number of commenters (0019, 0020, 0037, 0038) mentioned the date of 2033 as the original closure date proposed for the WIPP, and that this PCR is a change of that date to 2083. As a result, they request that EPA disallow the change to 2083 and require DOE to close WIPP by 2033.

Commenter 0018 mentioned that before any additional new panels are approved, a new Supplemental Environmental Impact Statement is required before expansion. The commenter stated that the addition of panels 11 and 12 violates EPA's public involvement guidance for expansion of existing facilities under Title VI of the Civil Rights Act of 1964. [FR 71 14215, Tuesday, March 21, 2006, "Title VI Public Involvement Guidance for EPA Assistance Recipients"] As well, the commenter emphasized that EPA needs to factor human error more strongly into PA calculations.

Commenters 0019 and 0020 mentioned that not all of the references used by DOE have been made publicly available.

Response to Issue 3.D:

The date of 2033 has been acknowledged by DOE as a placeholder date for performance assessment calculations and was originally based on limited inventory knowledge. As more information on the waste inventory has been developed over the operational lifespan of the WIPP to date, DOE has provided the revised estimated closure date of 2083, which is used in the compliance calculations. The setting of the closure date of the WIPP is outside the scope of this PCR.

The public involvement guidance does not apply to the WIPP site as there is no disproportionally affected population around the facility.

For the two replacement panels, DOE has already conducted a Supplement Analysis,⁹ and DOE will need to address this issue for any future PCR submission on panels 13-19.

The WIPP PA, which covers the EPA's regulatory period, 10,000 years after the closure of the repository, has taken into account both the undisturbed and the disturbed scenarios. In the undisturbed scenario, calculations show that the amount of radionuclides that potentially could reach the WIPP LWA boundary will be negligible. Only the disturbances from human intrusions can result in significant releases. When an intrusion through drilling occurs, multiple pathways for a potential release are possible, and EPA has focused on reviewing the disturbed scenario in WIPP PAs. EPA's primary focus is on the long-term performance of the facility and its compliance with the standards established in 40 CFR Part 191. NMED has oversight responsibilities for WIPP

⁹ See DOE/EIS-0026-SA-12, Revision 0 at https://wipp.energy.gov/library/seis/DOE_EIS-0026-SA-12_SA_for_WIPP_Site-Wide_Operations_Rev0_Final_Sig_on_File.pdf

operations, and the new Safety Significant Confinement Ventilation System should mitigate any potential releases such as the incident from 2014.

EPA understands that access to references is an issue that was also brought up at our public meetings, and we have asked DOE to make all references publicly available. EPA would like to reiterate that any specific references that the public/interested stakeholders are interested in can be made available upon request to EPA. Specific WIPP references or documents that are not readily publicly available/in the docket can usually be sent if EPA has possession of them unless they are copyrighted materials or Confidential Business Information.

Issue 3.E: Waste Characterization

Summary of Comments on Issue 3.E:

Commenter 0015 noted that “...despite the paperwork on the contents of each drum and the radiation monitoring programs, alpha radiation in transuranic waste is easily shielded and the contents of waste drums is often not adequately known. Drum sampling is expensive and contents are not necessarily homogeneous throughout the waste drum... improper loading of waste drums must be considered in safety analyses and the Performance Assessment.”

Commenter 0015 stated that “...the 2020 [National Academy of Sciences] report also discussed the Defense Nuclear Facilities Safety Board (DNFSB) concerns over how the material at risk (MAR) methodology may underestimate the quantity of material at risk within disposal areas in WIPP. Basically, the DNFSB found that in the WIPP panels, there are clusters of containers with higher radioactivity source terms. This means that accidents at WIPP may have higher radiological consequences than stated by the Department of Energy, both in the near term and in the long term.” They also wrote that “...The [2014] accident investigation report also discovered that far more plutonium/ameridium was released from a single drum in the February 12, 2014, event than the safety analysis predicted was possible. This emphasizes the inadequate characterization of waste drum contents and this does not appear to have been adequately addressed by the EPA.”

Commenter 0037 noted that no tank waste from Hanford should be shipped to WIPP.

Response to Issue 3.E:

EPA interprets these comments to be focused on the operational period of the disposal facility. While the operations are important, EPA’s focus is on the long-term performance of the facility. The modeling of the long-term performance indicates that the WIPP will comply with EPA’s standards. With the only viable pathway for releases to the environment involving drilling into the repository, the modeling will account for waste streams with higher volumes. For the operational period, DOE does have multiple analyses looking at the criticality issue. The analyses indicate that critically will not be an issue with the addition of the surplus Pu waste streams.

There is no need to measure Alpha radiation. Non-destructive analysis (NDA) measures or extrapolates all radionuclides by using either passive neutron or gamma measurement. Historical information provides another often very accurate source of information. Alpha is so easily shielded there is no means to measure it without additional exposure of personnel and expense. Alpha emitters all emit gamma as well and the gamma spectra disclose even weak emitters. The characterization of the radionuclide source term for the long-term performance assessment is not necessarily the same as the safety analysis projections of releasable material resulting from an accident. EPA ensures that DOE has a system of controls for each of the waste streams emplaced at WIPP, as described in 40 CFR 194.24. The system of controls shall include but shall not be limited to: Measurement; sampling; chain of custody records; record keeping systems; waste loading schemes used; and other documentation.

The inclusion of tank wastes from Hanford would require the approval of NMED before the waste could be disposed of at WIPP. Additionally, any waste would have to be defense TRU waste and would be required to meet the waste acceptance criteria to be accepted for disposal at WIPP.

Issue 3.F: Site Characterization

Summary of Comments under Issue 3.F.1:

Several commenters (e.g., 0014, 0018) noted that the expansion of the WIPP will move the footprint of the underground panels closer to oil and gas development.

Response to Issue 3.F.1:

The LWA set aside 16 square miles in a 4 x 4-mile square for the WIPP. The underground waste repository and surface facilities at WIPP are situated near the center of the 16 square miles, and the surrounding area is a buffer. Surface drilling activities for oil and gas development, or production of other resources like potash are not allowed inside of the withdrawal boundaries, and any drilling adjacent to the site is closely reviewed by DOE and the State of New Mexico.

When WIPP was established, drilling for oil and gas in the region was slow and production was declining, with very few wells nearby. There was an increase of oil and gas production in the mid-2000s. This drilling is tracked closely by DOE and the Delaware Basin Drilling Surveillance Program, as required by EPA regulation. The WIPP PA considers the possibility of future inadvertent intrusions by humans via drilling and disturbance by mining by extrapolating far into the future using current rates of drilling. DOE's RPPCR PA and EPA's sensitivity study PA both demonstrated that even with the expanded footprint of two additional panels and increased drilling rates, the WIPP still remains in compliance with limits for releases of radionuclides to the accessible environment.

Summary of Comments under Issue 3.F.2:

Commenter 0017 mentioned the issue of Karst features and requested that EPA require the use of Ground Penetrating Radar to identify Karst features.

Response to Issue 3.F.2:

Concerns about the potential for karst impacting the WIPP repository were addressed in the original WIPP Compliance Certification Application (CCA) and several other subsequent documents by both EPA and DOE, several of which are listed below. Karst was also thoroughly addressed in Sandia Report SAND2005-7303 *Assessment of the Potential for Karst in the Rustler Formation at the WIPP Site* by J.C. Lorenz (2005).

Ground penetrating radar is a geophysical method most suitable for shallow investigations and would not be able to detect karst features at depths and locations (e.g., Culebra) that would be of direct concern to WIPP. EPA believes that DOE will benefit from additional test and monitoring wells located in certain areas in the vicinity of the WIPP site to gather more direct information and reduce uncertainty of hydrogeological parameters associated with the Culebra Dolomite. DOE is planning to continue these investigations. EPA believes that the transportation of radionuclides within the Culebra is an important technical issue that can be refined for use in performance assessment calculations. However, updated information on the Culebra Dolomite is an issue most relevant to the additional, conceptual panels 13-19 located further to the west of the existing footprint than the decision for the more proximally located panels 11 and 12.

References:

EPA (1996), Criteria for the Certification and Re-Certification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations Response to Comments Document for 40 CFR Part 194, Section 7, Issue C¹⁰

EPA (2006), Criteria for the Certification and Recertification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations: Recertification Decision. EPA docket ID EPA-HQ-OAR-2004-0025-007, Section V¹¹

EPA (2006), Technical Support Document for Section 194.14/15 Evaluation of Karst at the WIPP Site. EPA docket ID EPA-HQ-OAR-2004-0025-0070¹²

Summary of Comments under Issue 3.F.3:

Commenter 0018 noted that they felt DOE has not adequately identified the locations of the marker beds, and that this indicated that DOE has not adequately characterized the location of panels 11 and 12.

¹⁰ Link to document at <https://www.epa.gov/radiation/wipp-1998-compliance-certification-documents>

¹¹ Link to document at <https://www.regulations.gov/document/EPA-HQ-OAR-2004-0025-0007>

¹² Link to document at <https://www.regulations.gov/document/EPA-HQ-OAR-2004-0025-0070>

Response to Issue 3.F.3:

The marker beds in the WIPP underground repository are well known within the existing repository footprint and were later confirmed in the area of the new waste panels first via cores drilled for Shaft #5, and again via the excavation of shaft #5 and associated access drifts. The location of the marker beds and their physical properties are a part of the RPPCR Performance Assessment.

Summary of Comments under Issue 3.F.4:

Commenter 0018 mentioned that EPA needed to further evaluate the Hartman Scenario, which involves the uncontrolled migration of brine from oil and gas extraction into the WIPP waste area.

Response to Issue 3.F.4:

The 2022 Delaware Basin Monitoring Annual Report reported an accidental brine release to the ground surface up a plugged potash core hole (PCA53) that was tentatively linked to a nearby hydraulic fracturing oil and gas well drilled by XTO Energy known as Remuda South 25-101H. The incident in fall 2018 was located over 8 miles southwest of the WIPP LWA boundary and outside of the 9-township primary focus area of the Delaware Basin Drilling Surveillance Program. EPA asked for additional information on the incident as part of its RPPCR review (Comment RPPCR1-DBMAR-1D, 4/17/2024, docket ID EPA-HQ-OAR-2024-0309-0002), and DOE provided an exhaustive response, including copies of relevant reports and communications from the regulatory agencies and companies involved (DOE Response Set #5, 1/30/2025, docket ID EPA-HQ-OAR-2024-0309-0048).

The possibility of migration of brine injected for water flooding or disposal from nearby oil and gas operations impacting the WIPP was originally raised in response to an event referred to as the “Hartman Case” that was extensively reviewed by EPA at the time of the initial WIPP Compliance Certification Application (see EPA Technical Support Document for Section 194.32 Fluid Injection Analysis (1998), docket ID A-93-02 V-B-22). Upon reviewing the provided information by DOE following the 2018 incident, EPA still finds the probability of such a scenario negatively impacting the WIPP repository system highly unlikely for many of the same reasons it found during the initial certification of WIPP. In addition, DOE and the Delaware Basin Drilling Surveillance Program have committed and taken steps to enhance communication and coordination with state and federal oil and gas regulators and industry in the area surrounding WIPP and inform EPA on relevant issues in a timely manner.

Appendix A: List of Commenters

Commenters on the RPPCR and EPA’s review are listed below. They are identified in the table and throughout the responses by their individual submittals to docket EPA-HQ-OAR-2024-0309. For example, the designation of “0009” in a comment summary refers to a letter submitted by a number of stakeholder groups, which is in the docket under docket ID EPA-HQ-OAR-2024-0309-0009.

Letter with multiple signatures	0008
Letter with multiple signatures	0009
John Tauxe	0012
Gail Robin Seydel	0014
Tami Thatcher	0015
John E. Wilks	0016
Citizens for Alternatives to Radioactive Dumping (CARD)	0017
Deborah Reade	0018
Southwest Research and Information Center	0019
Conservation Voters of NM	0020
285ALL	0021
William Hill III	0022
Pamela Gilchrist	0023
Edith (Dee) Homans	0024
David Hollenbach	0025
Jean Stevens	0026
285 Alliance	0027
Stacie Slay	0028
Stephanie Hedgecock	0029
L. Watchempino	0030
James Sprinkle	0031
Robert Birney	0032
Roberto Roibal	0033
Elizabeth Christine	0034
Penelope Mainz	0035
Rachel DiNitto	0036
Laura Feldman	0037
Green Party of the Albuquerque Metropolitan Area (GPAMA)	0038
Mark R. Stair	0039
Janet Greewald	0041
NMED	0042

Energy Communities Alliance (ECA)	0046
Daniel Cunningham	0054
Hannah Miller	0055