UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Washington, DC 20460

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OFFICE OF
AIR AND
RADIATION

Mr. Reinhard Knerr
Manager
Carlsbad Field Office
U.S. Department of Energy
P.O. Box 3090
Carlsbad, New Mexico 88221-3090

Dear Mr. Knerr:

The U.S. Environmental Protection Agency understands that the U.S. Department of Energy (DOE) anticipates developing additional waste emplacement capacity at the Waste Isolation Pilot Plant (WIPP) to replace two lost waste panels in the current design and will likely develop new waste panels that could provide for sufficient disposal space for the additional waste more recently identified for disposal by the National Nuclear Security Administration (NNSA) (National Academy of Sciences "Review of the Department of Energy's Plans for Disposal of Surplus Plutonium in the Waste Isolation Pilot Plant," 2020). Physical changes of this nature to the repository require prior EPA approval. As DOE moves forward with planning additional panels to increase the physical capacity or footprint of the repository, I would like to share some of EPA's expectations for the approval process.

EPA's oversight role at WIPP focuses on the long-term performance of the disposal system. As such, DOE should, to the best of its ability, submit for EPA review information that represents the anticipated state of the repository at the time of closure. Given that DOE is going through procedural steps and public engagement relating to disposal of additional waste volumes at WIPP, it appears that DOE will need to add multiple panels by the time of closure, beyond the two replacement panels for existing waste as identified in the recent "Supplement Analysis for the Waste Isolation Pilot Plant Site-Wide Operations" [DOE/EIS-0026-SA-12]. The paragraphs below provide some perspective on the Agency's process for reviewing DOE's plans for new panels.

Under 40 CFR 194.4(b)(3), DOE must give EPA prior notice of "any planned . . . changes in activities or conditions pertaining to the disposal system that differ significantly from the most recent compliance application." If the Administrator determines that the proposed changes differ significantly from the most recent compliance application, such that modification or revocation of the certification may be appropriate, section 194.65(a) provides that EPA will publish a Notice of Proposed Rulemaking in the Federal Register and solicit public comment. 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. If EPA were to undertake a rulemaking action that requires the opportunity for public notice and comment, EPA anticipates that the process could take at least two years, assuming DOE provides sufficient, appropriate information to EPA. Clarity on the full extent of DOE's plans for the WIPP would help EPA determine its path forward, provide for scheduling of required activities and improve coordination of activities with DOE.

As part of any planned change notification, EPA expects DOE to submit to EPA documentation relating to the planned change, including information to enable EPA to determine the possible effect or impact on the certification (see, for example, 40 CFR section 194.4(b)(2)). In connection with proposed new panels, the Agency anticipates needing information in these key categories: technical information identified and documented in the 2017 recertification decision (82 Fed. Reg. 33106 (July 19, 2017)); site characterization; information on future anticipated wastes; and the expected repository design.

Information from 2017 Recertification Decision:

- Actinide Solubility. In the 2017 recertification decision and subsequently, EPA identified the need to revisit the chemical conceptual models that affect actinide solubility, especially plutonium solubility. EPA has provided DOE with documentation of its view that the repository conditions will be more reducing (i.e., less oxygen will be present) than previously believed, resulting in an increase in the expected plutonium solubility, leading to higher calculated releases of radionuclides to the accessible environment than currently modeled by DOE. Given that more plutonium is being considered for disposal at WIPP in more concentrated forms than previously anticipated, and that higher plutonium solubility would affect releases, the Agency thinks that DOE's model of plutonium solubility under repository conditions needs to be updated in light of new information available since the initial certification in 1998.

- Modeling the Salt Creep Closure of Open Areas. Another issue identified in the 2017 recertification decision is related to the movement of the salt over time, which helps to contain the radioactivity in the repository. In the 2017 decision, EPA stated that DOE needed improved long-term performance information describing the salt creep behavior of open waste areas and access drifts, given the DOE decision not to install panel closures in abandoned areas. That is, according to DOE's current plans, WIPP will have more open areas in the repository than originally assumed at closure, and their presence needs to be accounted for in the modeling.

Site Characterization:

DOE must provide EPA with site characterization information specific to the location for new repository panels located to the west of the current waste panels as described, in part, in the recent WIPP Supplement Analysis. For example, the DOE site characterization should identify the potential for brine pockets in the Castille Formation, which underlies the waste area in the Salado Formation. This would require new data collection. Once DOE increases the repository footprint beyond the current characterized area, DOE will need to develop an acceptable methodology for incorporating new remote sensing data in a new probability distribution for a drilling intrusion hitting a brine pocket (i.e., modeling parameter PBRINE) that accounts for the existing waste area and any new planned waste area. In addition, with general plans to enlarge the repository by development toward the west, the waste panels would come closer to the western facility boundary, thus shortening the distance between a release and the facility boundary. Potentially, EPA may request that DOE provide more refined hydrologic information, including data from additional characterization wells, to better model a release from a drilling intrusion at the western boundary

Information on the Range of Potential Waste:

The Agency expects DOE to conduct an analysis of the full range of reasonably expected waste that may be disposed of at WIPP. Although EPA has not received a relevant planned change notice or other formal submission, EPA generally is aware of at least two potential waste streams that would require substantial space in the repository: waste associated with resuming the production of pits to support the

nuclear stockpile stewardship program (which the NNSA estimates in DOE/EIS-0236-S4-SA-02 could generate over 50,000 cubic meters of transuranic waste [see page 65]) and 34 (or more) metric tons of surplus plutonium identified to undergo the "dilute and dispose" process.

General Design for New Repository:

Lastly, the Agency expects that DOE will provide the general design of the new repository, to the best of available knowledge, that would accommodate disposal of the total anticipated waste. The repository design at closure is important for representing the disposal system in the modeling required for compliance (see 40 CFR 191.13, for example). DOE will need to model the repository that is expected for the future. The Agency understands that any initial design could change and that could be addressed as needed through the established planned change process.

In sum, EPA requests that DOE, as part of a future planned change seeking regulatory approval of modifications to the WIPP, address the aforementioned issues and include all reasonably foreseeable information related to the condition of the repository at the time of closure, using a repository footprint that addresses the potential future waste disposal needs. EPA staff are ready to discuss DOE's plans for future repository design, the Agency's information needs, and the process associated with certifying a significant redesign of the repository.

I hope this information is helpful as DOE continues to plan for the future of WIPP. If you have questions or need more information, please contact me or Tom Peake, Director of the Center for Waste Management and Regulations, at (202) 343-9765 or peake.tom@epa.gov.

Sincerely,

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Lee Ann B. Veal
Director
Radiation Protection Division

Enclosure

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