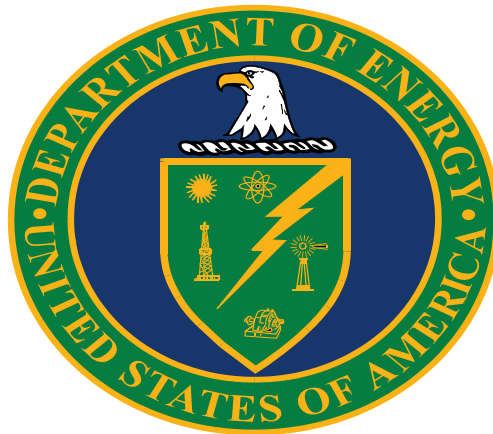

**Title 40 CFR Part 191
Subparts B and C
Compliance Recertification Application 2019
for the
Waste Isolation Pilot Plant
Executive Summary**



**United States Department of Energy
Waste Isolation Pilot Plant**

Carlsbad Field Office
Carlsbad, New Mexico

Compliance Recertification Application 2019

Executive Summary

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Acronyms and Abbreviations

CCA	Compliance Certification Application
CCDF	complementary cumulative distribution functions
CFR	Code of Federal Regulations
CRA	Compliance Recertification Application
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
LWA	Land Withdrawal Act
PA	performance assessment
PCN	planned change notice
TRU	transuranic
WIPP	Waste Isolation Pilot Plant

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EXECUTIVE SUMMARY

EXECSUM-1.0 Overview

The Waste Isolation Pilot Plant (WIPP), located near Carlsbad, New Mexico, is a deep geologic repository for the disposal of defense-related transuranic (TRU) waste. The WIPP Land Withdrawal Act (LWA) ([Pub. L. 102-579](#), 106 stat. 4777, as amended by Pub. L. 104-201, 110 stat. 2422) requires the U.S. Environmental Protection Agency (EPA) to certify the WIPP's compliance with the disposal regulations of Title 40 CFR (Code of Federal Regulations) 191 Subparts B and C prior to the commencement of disposal operations. To meet this requirement, the U.S. Department of Energy (DOE) submitted the Compliance Certification Application (CCA) ([U.S. DOE 1996](#)) to the EPA in October 1996, demonstrating compliance with the disposal standards and the criteria established in Title 40 CFR 194 ([U.S. EPA 1996](#)). The CCA demonstrated that the geological, hydrological, physical, chemical, and environmental characteristics of the site, along with engineered features of the facility, would safely contain radioactive waste for the 10,000-year regulatory time period. The EPA certified the WIPP's compliance with these regulations in May 1998, which led to the start of waste disposal operations on March 26, 1999.

The WIPP LWA requires the DOE to, "...submit documentation of the WIPP's continued compliance with the disposal regulations to the EPA not later than five years after initial receipt of TRU waste for disposal at the repository, and every five years thereafter until the decommissioning of the facility is completed." This periodic documentation of continued compliance is referred to as "recertification." The DOE has completed three recertification cycles. The Compliance Recertification Application-2019 (CRA-2019) is the fourth recertification application submitted to the EPA in accordance with the provisions of the LWA, and is the DOE's documentation of the WIPP's continued compliance with the applicable radioactive waste disposal standards in 40 CFR 191 and the recertification criteria in [40 CFR 194](#).

The WIPP Compliance Criteria in 40 CFR 194.15 outline the content of recertification applications, and state that such applications must be updated to provide the EPA sufficient information to determine if the WIPP continues to comply with the disposal regulations. Such updates include new data concerning the repository and disposal inventory, monitoring data, analyses and laboratory data. The recertification application must also identify any activities or assumptions that deviate from the most recent application as well as any significant information not previously included in a recertification application. Finally, the application must also include any additional information requested by the EPA. The CRA-2019 includes changes that resulted from continuing scientific investigations and operations at the WIPP, as well as changes resulting from EPA's review of the CRA-2014 during the time period between January 1, 2013, and the CRA-2019 data cut-off date of January 8, 2018.

The DOE's last CRA (CRA-2014) was submitted to EPA on March 26, 2014, based on data received up until January 1, 2013. On February 14, 2014, an underground continuous air monitor measured airborne radioactivity near the location where waste was being placed within the WIPP repository. The air exhaust switched to a filtered mode of operation to capture radioactive

material before it could enter the environment. On the following day, an aboveground exhaust air monitor on the WIPP site detected very low levels of airborne americium and plutonium venting to the environment. It is believed that a small amount of radioactivity leaked through the air exhaust-duct dampers, bypassing the filtration system ([U.S. EPA 2014](#)). The February 14, 2014, radiological release does not affect the long-term performance of the repository and the WIPP is still in compliance with the requirements set forth in 40 CFR 191, Subparts B and C. Waste emplacement in the repository resumed in January, 2017. The EPA issued its recertification decision, affirming that the WIPP remained in compliance with the disposal regulations, on July 11, 2017.

This recertification cycle is different from past cycles because the CRA-2014 recertification decision was delayed, leaving a shortened interval between the EPA decision and the submittal of the next CRA. In addition, the EPA's recertification decision documents ([U.S. EPA 2017a](#)) discussed several technical concerns and recommendations that could be addressed in the CRA-2019. As such, a decision was made to defer the submittal of the CRA-2019 Performance Assessment (PA) to late 2019 ([U.S. DOE 2017c](#)) ([U.S. EPA 2017b](#)), and to delay submittal of some of the PA related material until that time. The documentation of DOE responses for certain technical concerns and recommendation is being submitted with this CRA or will be submitted with the deferred PA documents. EPA is in agreement with this approach.

The DOE has not submitted a planned change request since the last EPA recertification. The CRA-2014 PA continues to be the baseline PA for the WIPP certification and is included by reference in the CRA-2019 submittal. As stated in 40 CFR 194.15, the recertification application is to include information necessary to demonstrate continued compliance with the disposal standard. The DOE has not identified new information since the last recertification application that impacts the continued compliance with the disposal standard.

EXECSUM-1.1 Contents of the CRA-2019

The CRA-2019 has been developed in accordance with the EPA's Certification Criteria found in 40 CFR 194. This document addresses all topics relevant to the certification process. Topics addressed in the CRA-2019 include (see Table EXECSUM-1), but are not limited to, the following:

- Natural and engineered features of the disposal system, including geology, geophysics, and hydrogeology of the repository and its environs, as well as the geochemistry and actinide chemistry of interactions between the disposal system and the emplaced TRU wastes.
- Information concerning the inventories of TRU waste emplaced in the repository, waste stored at DOE sites, and waste expected to be generated at those sites and emplaced in the WIPP in the future.
- Projected performance of the disposal system over the 10,000-year regulatory period to demonstrate that any releases of radionuclides from the WIPP will comply with the containment requirements.

- Demonstration that the WIPP complies with individual and groundwater protection standards and will continue to do so.
- Description of assurance requirements, including active and passive institutional controls, monitoring, engineered barriers and the effects of natural resource extraction.

Table EXECSUM-1 identifies the sections and appendices included in the March 2019 submittal for CRA-2019.

Table EXECSUM-1. Sections and Appendices Included with the March 2019 Submittal of CRA-2019

Section 8: Approval Process for Waste Shipment From Waste Generator Sites for Disposal at the WIPP	Section 43: Passive Institutional Controls
Section 15: Content of Compliance Recertification Application(s)	Section 44: Engineered Barriers
Section 21: Inspections	Section 45: Consideration of the Presence of Resources
Section 22: Quality Assurance	Section 46: Removal of Waste
Section 23: Models and Computer Codes	Section 51-52: Consideration of Protected Individual and Exposure Pathways
Section 24: Waste Characterization	Section 53: Consideration of Underground Sources of Drinking Water
Section 25: Future States Assumptions	Section 54: Scope of Compliance Assessments
Section 26: Expert Judgment	Section 55: Results of Compliance Assessments
Section 27: Peer Review	Appendix AUD: Audits and Surveillances
Section 31: Application of Release Limits	Appendix DATA: Monitoring Data and Reports
Section 32: Scope of Performance Assessments	Appendix HYDRO: Hydrological Investigations
Section 33: Consideration of Drilling Events in Performance Assessments	Appendix IGP: Individual and Groundwater Protection Requirements
Section 34: Results of Performance Assessments	Appendix MON: WIPP Monitoring Programs
Section 41: Active Institutional Controls	Appendix MgO: Magnesium Oxide as an Engineered Barrier
Section 42: Monitoring	Appendix TFIELD: Transmissivity Fields

EXECSUM-1.2 Programmatic Changes Since the CRA-2014

This application incorporates information about changes that have taken place since the data cut-off for CRA-2014. These changes are described in Sections 15 and 24 of this application. These changes have been proposed by the DOE or requested by the EPA, or driven by the availability of new data, and include:

- Inventory: The inventory used in the CRA-2019 is updated from that used in the CRA-2014. Section 24 of this application contains a summary of the waste inventory based on the Annual Transuranic Waste Inventory Report - 2017 ([U.S. DOE 2017e](#)).

- Planned Change Notices:

- **Planned Change Notice (PCN) for Panel 7 Configuration of Transuranic Waste Emplacement**

On August 28, 2017, the DOE submitted to the EPA a PCN for Panel 7 Configuration of Transuranic Waste Emplacement ([U.S. DOE 2017a](#)). The PCN provides flexibility needed for the DOE to determine the optimum waste configuration in each disposal room at the time of emplacement based on considerations of worker safety. The EPA has not formally responded to DOE's PCN.

- **PCN for Excavation and Construction of a New Ventilation Shaft and Associated Access Drifts**

On September 29, 2017, the DOE submitted to the EPA a PCN for Excavation and Construction of a New Ventilation Shaft and Associated Access Drifts ([U.S. DOE 2017b](#)). This PCN notifies the EPA of the DOE's plan to add a new ventilation shaft and associated drifts to the underground facility to expand the capacity of the ventilation system.

The EPA acknowledged receipt of the PCNs in a letter dated January 22, 2018 ([U.S. EPA 2018](#)).

Other non-significant changes, such as procedure revisions and PA software and hardware changes, are summarized in the Annual Change Reports ([U.S. DOE 2013](#), [U.S. DOE 2014](#), [U.S. DOE 2015](#), [U.S. DOE 2016](#), and [U.S. DOE 2017d](#)) submitted to the EPA as required by 40 CFR 194.4(b)(4).

EXECSUM-1.3 PA Results

Performance of the WIPP disposal system is evaluated by means of a WIPP PA, which uses a methodology for quantifying the probability of radionuclide releases from the WIPP repository for 10,000 years after closure and characterizes the uncertainty in the distribution. The WIPP PA results are required to be expressed as complementary cumulative distribution functions (CCDFs). A CCDF represents the probability of exceeding various levels of cumulative release.

A PA has been included as part of the recertification application for all past recertification cycles, although it is not explicitly required for recertification by the LWA, 40 CFR 191 or 40 CFR 194. The DOE has decided, with agreement from EPA, not to include an updated PA in CRA-2019. The CRA-2019 contains all updated information and data required by 40 CFR 194.15, *Content of compliance recertification applications*. DOE plans to separately submit PA results based on CRA-2019 data in late 2019. The PA used in the CRA-2014 continues to be the baseline PA for the WIPP certification and is included in this CRA-2019 submittal by reference. This PA shows WIPP is compliant with 40 CFR 194.

Table EXECSUM-2 identifies the appendices included with the Deferred PA.

Table EXECSUM-2. Appendices Included with the Deferred PA for CRA-2019

¹ Appendix GEOCHEM: Implementation of Chemistry Conceptual Models
Appendix MASS: Performance Assessment Modeling Assumptions
Appendix PA: Performance Assessment
Appendix PORSURF: Porosity Surface
Appendix SCR: Feature, Event, and Process Screening for Performance Assessment
Appendix SOTERM: Actinide Chemistry Source Term

In addition to the documents shown in Table EXECSUM-2, the deferred PA documentation will include an executive summary with a CRA-2019 crosswalk outlining where information is located for the applicable requirements of 40 CFR 194. The deferred PA documentation will include the PA results, an associated analysis report, inventory information and potential section/appendices addendums necessary to provide revised information related to 40 CFR 194.15 CRA content requirements.

EXECSUM-2.0 References

(*Indicates a reference that has not been previously submitted.)

U.S. Congress. 1996. Public Law 102-579. Waste Isolation Pilot Plant Land Withdrawal Act of 1992, as amended by Public Law 104-201, 1996.

U.S. Department of Energy (DOE). 1996. Title 40 CFR Part 191 Compliance Certification Application (October). Carlsbad, NM: Carlsbad Field Office. DOE/CAO 1996-2184.

U.S. Department of Energy (DOE). 2013. Annual Change Report 2012/2013, October 15, 2013. Carlsbad, NM: Carlsbad Field Office. DOE/WIPP 13-3513.*

U.S. Department of Energy (DOE). 2014. Annual Change Report 2013/2014, November 2014. Carlsbad, NM: Carlsbad Field Office.*

U.S. Department of Energy (DOE). 2015. Annual Change Report 2014/2015, November 2015. Carlsbad, NM: Carlsbad Field Office.*

U.S. Department of Energy (DOE). 2016. Annual Change Report 2015/2016, November 2016. Carlsbad, NM: Carlsbad Field Office.*

U.S. Department of Energy (DOE). 2017a. Letter from Shrader, T., DOE to Veal, L., EPA. Planned Change Notice for Panel 7 Configuration of Transuranic Waste Emplacement. August 28, 2017. U.S. DOE, Carlsbad, NM: Carlsbad Field Office.*

U.S. Department of Energy (DOE). 2017b. Letter from Shrader, T., DOE to Veal, L., EPA. Planned Change Notice Regarding Excavation and Construction of a new Ventilation Shaft and

¹ New for CRA-2019

Associated Access Drifts at the Waste Isolation Pilot Plant. September 29, 2017. U.S. DOE, Carlsbad, NM: Carlsbad Field Office.*

U.S. Department of Energy (DOE). 2017c. Letter from Shrader, T., DOE to Edwards J.D., EPA. Compliance Recertification Application (CRA) 2019. October 5, 2017. U.S. DOE, Carlsbad, NM: Carlsbad Field Office.*

U.S. Department of Energy (DOE). 2017d. Annual Change Report 2016/2017, November 2017. Carlsbad, NM: Carlsbad Field Office.*

U.S. Department of Energy (DOE). 2017e. Annual Transuranic Waste Inventory Report – 2017. Carlsbad, NM: Carlsbad Field Office. DOE/TRU-17-3425 Rev 0, December 2017.*

U.S. Environmental Protection Agency (EPA). 1996. 40 CFR Part 194: Criteria for the Certification and Recertification of the Waste Isolation Pilot Plant's Compliance with the 40 CFR Part 191 Disposal Regulations; Final Rule. *Federal Register*, vol. 61 (February 9, 1996): 5223-5245.

U.S. Environmental Protection Agency (EPA). 2014. Summary of EPA's Response and Findings Related to the February 2014 Radioactive Release at the Waste Isolation Pilot Plant. September 2014. U.S. EPA, Washington D.C.*

U.S. Environmental Protection Agency (EPA). 2017a. Criteria for the Certification and Recertification of the Waste Isolation Pilot Plant's Compliance with the Disposal Regulations: Recertification Decision. July 19, 2017. *Federal Register* vol. 82, 33106-33122.*

U.S. Environmental Protection Agency (EPA). 2017b. Letter from Veal, L., EPA to Shrader, T., DOE. December 4, 2017. U.S. EPA, Washington D.C.*

U.S. Environmental Protection Agency (EPA). 2018. Letter from Veal, L., EPA to Shrader, T., DOE. Responding to the DOE's Planned Change Notice regarding the construction of a new ventilation shaft, January 22, 2018. U.S. EPA, Washington, D.C.*