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

**Content of Compliance
Recertification Application(s)
(40 CFR 194.15)**



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

Carlsbad Field Office
Carlsbad, New Mexico

Compliance Recertification Application 2019
Content of Compliance
Recertification Application(s)
(40 CFR 194.15)

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Acronyms and Abbreviations

ASER	Annual Site Environmental Report
ATWIR	Annual Transuranic Waste Inventory Report
CFR	Code of Federal Regulations
CH	contact-handled
CRA	Compliance Recertification Application
DM	dark matter
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EXO	Enriched Xenon Observatory
GAR	geotechnical analysis report
LWA	Land Withdrawal Act
Md	Coda Magnitude
MEGA	Multiple Element Germanium Array
PA	performance assessment
PCN	Planned Change Notice
PCR	Planned Change Request
RH	remote-handled
SEGA	Segmented Enriched Germanium Assembly
TPC	Time Projection Chamber
TRU	transuranic
WIPP	Waste Isolation Pilot Plant

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15.0 Content of Compliance Recertification Application(s) (40 CFR 194.15)

15.1 Requirements

194.15 Content of Compliance Recertification Application(s)

(a) In submitting documentation of continued compliance pursuant to section 8(f) of the WIPP LWA, the previous compliance application shall be updated to provide sufficient information for the Administrator to determine whether or not the WIPP continues to be in compliance with the disposal regulations. Updated documentation shall include:

- (1) All additional geologic, geophysical, geochemical, hydrologic, and meteorological information;
- (2) All additional monitoring data, analyses and results;
- (3) All additional analyses and results of laboratory experiments conducted by the Department or its contractors as part of the WIPP program;
- (4) An identification of any activities or assumptions that deviate from the most recent compliance application;
- (5) A description of all waste emplaced in the disposal system since the most recent compliance certification or re-certification application. Such description shall consist of a description of the waste characteristics and waste components identified in 194.24(b)(1) and 194.24(b)(2);
- (6) Any significant information not previously included in a compliance certification or re-certification application related to whether the disposal system continues to be in compliance with the disposal regulations; and
- (7) Any additional information requested by the Administrator or the Administrator's authorized representative.

(b) To the extent that information required for a re-certification of compliance remains valid and has been submitted in previous certification or re-certification applications(s), such information need not be duplicated in subsequent applications; such information may be summarized and referenced.

15.2 Background

The focus of 40 CFR 194.15 is to ensure that each Compliance Recertification Application (CRA) includes documentation regarding any changes to the disposal system that may have occurred since the previous certification or recertification. Updated information regarding relevant aspects of the waste and the disposal system is documented.

Information and data from previous compliance certification and recertification applications that form the basis of past U.S. Department of Energy (DOE) compliance positions and past U.S. Environmental Protection Agency (EPA) decision documents are found in the CRA-2014 ([U.S. DOE 2014a](#)).

15.3 Changes or New Information Since the CRA-2014

Changes and new information since the CRA-2014 related to 40 CFR 194.15 are either described below, or references are provided to other sections or appendices of the CRA-2019 that provide the necessary information.

Much of the information provided in this section was obtained from routinely published reports. Table 15-1 lists these reports and summarizes the type of information contained in each report. The specific reports referenced in Table 15-1 are the latest versions published before this CRA's data cutoff date of January 8, 2018.

Table 15-1. Routine Reports

Description	Summary	Frequency	Reference ^a
WIPP Annual Site Environmental Report (ASER)	Describes compliance status with applicable environmental laws and regulations and environmental monitoring performed during the year at the Waste Isolation Pilot Plant (WIPP). Highlights any significant monitoring results or findings.	Annual	U.S. DOE 2017a
Geotechnical Analysis Report	Reports data related to the geotechnical performance of the various underground facility components, including the shafts, shaft stations, access drifts, and waste disposal areas. Volume 1 describes the overall program; Volume 2 provides a compilation of the collected data.	Annual	U.S. DOE 2017b
Delaware Basin Monitoring Annual Report	Lists changes in drilling including rates for shallow and deep drilling; pipeline activity; borehole plugging; injection wells; potash, sulfur, and solution mining; and any other new activity related primarily to human intrusion. This report generates data needed to demonstrate compliance with 40 CFR 194.33.	Annual	U.S. DOE 2017c
WIPP Annual Change Report	Provides information each year on any change in conditions or activities related to the disposal system, as required by 40 CFR 194.4(b)(4). The majority of the items reported are inspections, reports, and modifications to written plans and procedures. In addition, the Annual Change Report provides updated emplaced transuranic (TRU) waste inventory information.	Annual	U.S. DOE 2017d
WIPP Subsidence Monument Leveling Survey	Includes determination of the elevation of each of the existing subsidence monuments and the WIPP baseline survey, and of the National Geodetic Survey's vertical control points.	Annual	U.S. DOE 2017e
Annual Transuranic Waste Inventory Report (ATWIR)	Documents information regarding current and future inventories stored and projected at TRU waste generator sites.	Annual	U.S. DOE 2017f
WIPP Biennial Environmental Compliance Report	As required by the WIPP Land Withdrawal Act (LWA), this document reports the status of the project's compliance with a variety of environmental protection laws and regulations.	Biennial	U.S. DOE 2016a

^aThe entry in this column is the most recent report available.

15.3.1 40 CFR 194.15(a)(1)

Title 40 CFR 194.15(a)(1) requires the submittal of “all additional geologic, geophysical, geochemical, hydrologic, and meteorological information.” Information related to this requirement is provided in Sections 15.3.1.1 through 15.3.1.5.

15.3.1.1 Geologic Information

Since the CRA-2014 data cutoff, no new geologic mapping were reported, and three new WIPP monitoring wells have been drilled, which replace existing WIPP monitoring wells in deteriorated condition that were plugged and abandoned. The new and plugged WIPP monitoring wells are discussed in Appendix HYDRO-2019 Attachment A.

In addition, in 2017/2018, the core hole for a planned new ventilation shaft ([U.S. DOE 2017g](#)) was drilled and the geologic description and correlation with air intake shaft geology was documented by the WIPP Environmental Monitoring and Hydrology Program and Sandia National Laboratories.

15.3.1.2 Geophysical Information

The Delaware Basin Drilling Surveillance Program collects seismic information on areas within and outside of the Delaware Basin (defined in 40 CFR 194.2).

Earthquake catalogs are usually divided into categories according to the magnitude registered for each event. Most catalogs have a section detailing seismic events with a magnitude greater than 3.0 because this is the point at which most seismic events can be sensed. Seismic events with a magnitude below 3.0 are hardly noticeable.

During the CRA-2019 monitoring period (January 2013 through January 2018) there were 839 seismic events recorded within approximately 300 kilometers (187 miles) of the WIPP site. No notable seismic events with a magnitude greater than 3.0Md (Coda Magnitude) occurred in Eddy or Lea counties during the reporting period. Recorded events that have occurred within the reporting period for the CRA-2019 are listed in Table 15-2, Seismic Events in the Delaware Basin.

Table 15-2. Seismic Events in the Delaware Basin 2013 - 2017

County	No. of Events	Latest Event	Largest Magnitude(Md)
Culberson	1	03/28/2015	0.65
Eddy	3	03/18/2017	2.4
Jeff Davis	4	05/27/2017	1.94
Lea	3	04/02/2017	1.25
Loving	3	09/27/2017	1.19
Pecos	15	05/12/2017	1.99
Reeves	57	09/30/2017	2.16
Ward	8	09/27/2017	2.8

Source: Data obtained from the Delaware Basin Well Tracking Application

15.3.1.3 Geochemical Information

New hydrogeochemical information has been collected and summarized since the CRA-2014. This new information is described in detail in Appendix HYDRO-2019 and Appendix GEOCHEM-2019.

15.3.1.4 Hydrologic Information

Three new monitoring wells (AEC-7R, H-12R, and H-10cR) have been added to the WIPP monitoring network since the CRA-2014 cutoff date, to replace three deteriorated wells (AEC-7, H-12, and H-10c) that were plugged and abandoned. Updated hydrologic data and well construction and replacement information are provided in Appendix HYDRO-2019.

15.3.1.5 Meteorological Information

The Meteorological Monitoring Program measures atmospheric data for the WIPP site. No anomalous weather events or changes in climatic conditions occurred during the CRA-2019 reporting period. Information related to recent meteorological conditions is provided in the ASER for the reporting period ([U.S. DOE 2013a](#), [U.S. DOE 2014b](#), [U.S. DOE 2015a](#), [U.S. DOE 2016b](#), and [U.S. DOE 2017a](#)).

15.3.2 40 CFR 194.15(a)(2)

Title 40 CFR 194.15(a)(2) requires the submittal of “all additional monitoring data, analyses, and results.” Information related to this requirement is provided below.

Environmental monitoring programs and references to relevant reports such as the Geotechnical Analysis Report and the Delaware Basin Drilling Surveillance Program Annual Report are included in Appendix MON-2019 and Appendix DATA-2019. Data on parameters required for pre-closure and post-closure monitoring, including programs for geotechnical and geoscience monitoring, are described in Appendix MON-2019, which focuses on parameters that may be relevant to the long-term performance of the repository. Appendix DATA-2019, Sections DATA-2.0 and DATA-3.0, reference the reports related to parameters in the Delaware Basin, including drilling rates, oil and gas production activities, and subsidence monitoring. Appendix HYDRO-2019, Attachment A, WIPP Borehole Update, provides an updated list of boreholes in the vicinity of the WIPP. The above referenced reports and appendices constitute all additional monitoring data, analyses and results produced since the CRA-2014.

15.3.3 40 CFR 194.15(a)(3)

Title 40 CFR 194.15(a)(3) requires the submittal of “all additional analyses and results of laboratory experiments conducted by the Department or its contractors as part of the WIPP program.” Section 15.3.3.1 describes all experimental work conducted since the CRA-2014 in the areas of WIPP repository conditions and parameters which include: Geochemistry; Microbiology; Colloids; Actinide Sorption, Solubility, and Complexation and Redox; and Rock Mechanics.

15.3.3.1 WIPP Repository Conditions, Chemistry, and Processes

Appendix DATA-2019, Section DATA-9.0 provides references about EDTA, citrate, lead, iron, borate, microbiology, colloids, actinide chemistry, waste compaction behavior, salt reconsolidation, panel closure, and WIPP stratigraphy, which occurred after the CRA-2014. The DOE has deferred submittal of the CRA-2019 performance assessment (PA) until after submission of the CRA-2019 (see Executive Summary 2019, Section 1.3). A detailed description of the current conditions and assumptions used in the PA will be provided in that deferred PA submittal.

15.3.4 40 CFR 194.15(a)(4)

Title 40 CFR 194.15(a)(4) requires that the DOE “identify any activities or assumptions that deviate from the most recent compliance application.” Information related to this requirement is provided in Sections 15.3.4.1 through 15.3.4.5.

15.3.4.1 Status of Underground Excavation

The status of mining in the WIPP underground repository is shown in Figure 15-1. As of December 31, 2017, Panels 1 through 7 have been mined completely and Panels 1, 2, 3, 4, 5, and 6 are filled with waste. Some waste has been emplaced in Panel 7, and Panel 8 has been partially mined.

The geotechnical analysis reports (GAR) from 2013 through 2017 reported the replacement of failed rock bolts as well as some areas experiencing rock falls due to the restricted access caused by the 2014 fire and radiological release events in the WIPP underground. This restricted access in the underground reduced the pace of ground control since the CRA-2014 ([U.S. DOE 2013b](#), [U.S. DOE 2014c](#), [U.S. DOE 2015b](#), [U.S. DOE 2016c](#), and [U.S. DOE 2017b](#)). No significant geoscience activities have occurred since the CRA-2014. Information reported in the GARs contributes to understanding of the dynamic geomechanical processes in the WIPP underground.

15.3.4.2 Remote-Handled Transuranic Waste Emplacement

Remote-handled transuranic (RH-TRU) waste was emplaced in Panels 4, 5, 6, and continues to be placed in Panel 7 (see Figure 15-1). Shielded container assemblies are used to dispose of RH-TRU waste but will be managed and emplaced as contact-handled transuranic (CH-TRU) waste.

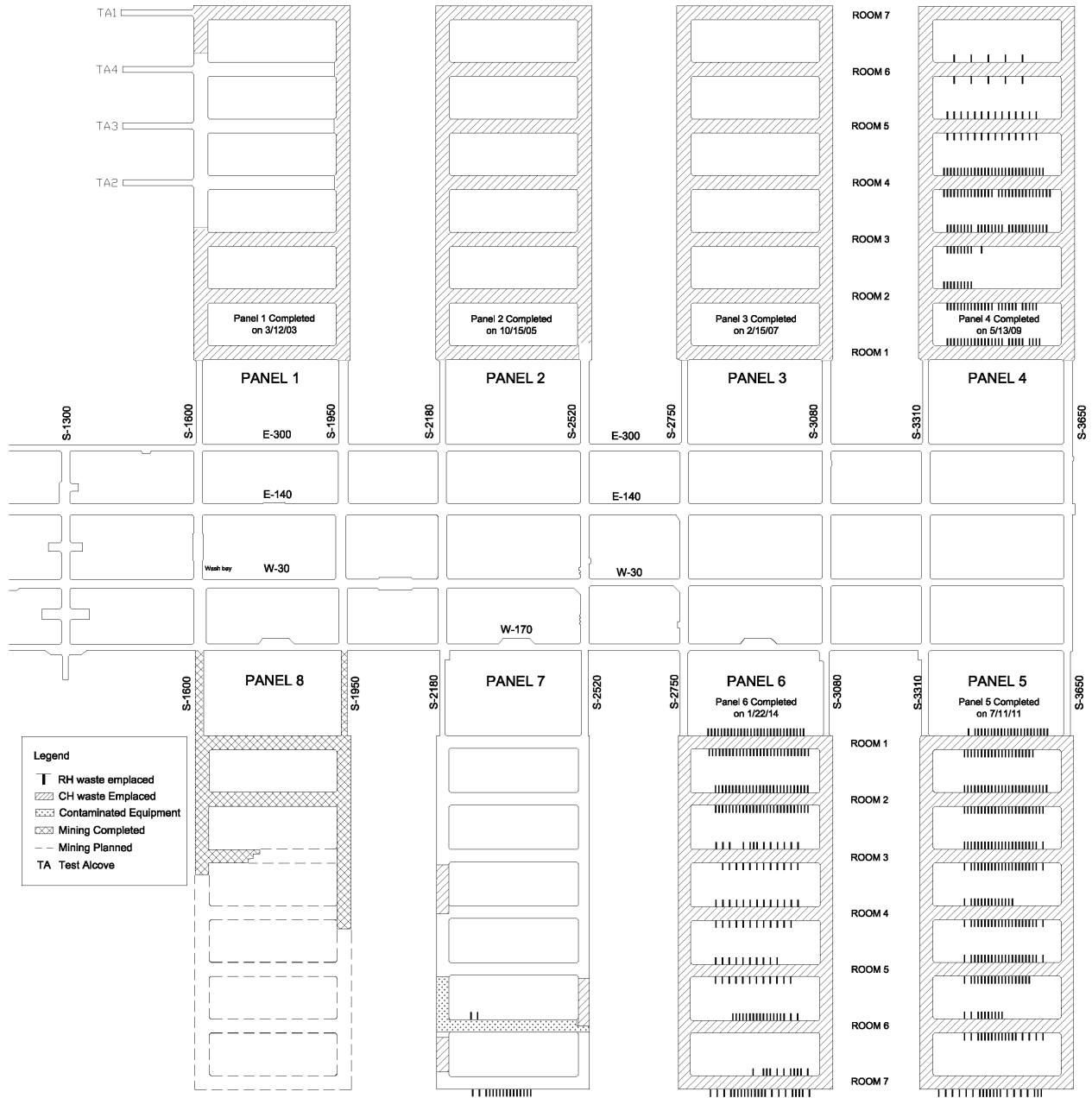


Figure 15-1. Status of Mining and Waste Emplacement as of December 31, 2017

15.3.4.3 Experiments in the WIPP Underground Repository

Several research projects are ongoing at the WIPP. A description of the experiments can be found in Section 15 of the CRA-2014. The underground thermal experiments described below are new in CRA-2019. A list of the other experiments and their current status is also provided below:

- Los Alamos National Laboratory, Lawrence Berkeley National Laboratory, and Sandia National Laboratories have ongoing research at the WIPP testing bedded salt as host for heat generating radioactive materials. Until the Salt Disposal Investigations drifts east of E-140 in drift N-780 and N-940 can be accessed, thermal experiments are being conducted at temporary locations in the WIPP underground. A Prototype Canister Heater (W-620 & N-150) began heating and data collection in 2017. Additionally, planning began to utilize boreholes cored in 2013 at E-140 and N-1050 to develop techniques to quantify brine availability.
- Segmented Enriched Germanium Assembly (SEGA), and Multiple Element Germanium Array (MEGA)
 - All SEGA and MEGA experimental work ended in March 2015.
- Enriched Xenon Observatory (EXO)
 - EXO activities stopped in 2014 due to the underground events, but resumed data collection in 2016.
- Dark Matter Time Projection Chamber (DM-TPC)
 - Due to restricted access in the underground caused by the 2014 events, the DM-TPC has stopped data collection.
- Low Background Radiation Experiment
 - Experiments have been ongoing in the WIPP underground since 2009.

15.3.4.4 Planned Change Notice Submittals

A Planned Change Notice (PCN) is a formal submittal of information to the EPA that describes minor, insignificant changes to activities and conditions at the WIPP that are different from those described in the compliance baseline. A summary of the PCNs submitted since the CRA-2014 is provided below.

Planned Change Notice for Excavation and Construction of a New Ventilation Shaft and Associated Access Drifts

On September 29, 2017, the DOE submitted to the EPA a Planned Change Notice for Excavation and Construction of a New Ventilation Shaft and Associated Access Drifts ([U.S. DOE 2017g](#)).

This PCN notifies the EPA of DOE/Carlsbad Field Office'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 PCN in a letter dated January 22, 2018 ([U.S. EPA 2018](#)).

Planned Change Notice for Panel 7 Configuration of Transuranic Waste Emplacement

On August 28, 2017, the DOE submitted to the EPA a Planned Change Notice for Panel 7 Configuration of Transuranic Waste Emplacement ([U.S. DOE 2017h](#)). 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.

15.3.4.5 Planned Change Request Submittals

A Planned Change Request (PCR) is a formal submittal of request to the EPA for approval of a significant change to activities and conditions at the WIPP that are different than those described in the compliance baseline. There have been no PCR submittals since the CRA-2014.

15.3.5 40 CFR 194.15(a)(5)

Title 40 CFR 194.15(a)(5) requires that the CRA-2019 include "a description of all waste emplaced in the disposal system since the most recent compliance certification or recertification application. Such description shall consist of a description of the waste characteristics and waste components identified in 194.24(b)(1) and 194.24(b)(2)." Information related to these requirements is provided in Sections 15.3.5.1 and 15.3.5.2.

15.3.5.1 Status of Waste Emplacement

The status of waste emplacement in the WIPP underground repository is illustrated in Figure 15-1. Additional detail is provided in the Annual Change Reports ([U.S. DOE 2013c](#), [U.S. DOE 2014d](#), [U.S. DOE 2015c](#), [U.S. DOE 2016d](#), and [U.S. DOE 2017d](#)).

15.3.5.2 Waste Characteristics and Components Important to Demonstration of Compliance

Section 24 provides an updated waste inventory of waste anticipated to be emplaced in the WIPP and waste that has already been emplaced since the CRA-2014. Section 24 also reports the impacts of waste inventory on the performance of the WIPP disposal system.

There have been five inventory updates in ATWIRs 2013 - 2017 ([U.S. DOE 2014e](#), [U.S. DOE 2014f](#), [U.S. DOE 2015d](#), [U.S. DOE 2016e](#), and [U.S. DOE 2017f](#)) since the CRA-2014.

15.3.6 40 CFR 194.15(a)(6)

Title 40 CFR 194.15(a)(6) requires the submittal of "any significant information not previously included in a compliance certification or recertification application related to whether the disposal system continues to be in compliance with the disposal regulations."

The information required by this section of the certification criteria is provided in the sections and appendices of the CRA-2019. The information in this section and in other sections and appendices of the CRA-2019, and in the deferred PA, will establish that the DOE continues to demonstrate compliance with the requirements of 40 CFR 194.15.

15.3.7 40 CFR 194.15(a)(7)

Title 40 CFR 194.15(a)(7) requires the submittal of “any additional information requested by the Administrator or the Administrator’s authorized representative.”

There currently are no outstanding requests from the EPA for additional information.

15.3.8 40 CFR 194.15(b)

Title 40 CFR 194.15(b) states: “To the extent that information required for a re-certification of compliance remains valid and has been submitted in previous certification or re-certification applications(s), such information need not be duplicated in subsequent applications; such information may be summarized and referenced.”

The DOE has followed this direction in the preparation of this recertification application. To the extent appropriate, information from the Compliance Certification Application ([U.S. DOE 1996](#)), the CRA-2004 ([U.S. DOE 2004](#)), the CRA-2009 ([U.S. DOE 2009](#)), and the CRA-2014 that remains valid and unchanged is not repeated in this recertification application; instead, it is summarized and incorporated by reference.

15.3.9 Status of Compliance with 40 CFR 194.15

The information in this section and in other sections and appendices of the CRA-2019, and in the deferred PA, will establish that the DOE continues to demonstrate compliance with the requirements of 40 CFR 194.15.

15.4 References

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

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U.S. Department of Energy (DOE). 2016c. Geotechnical Analysis Report for July 2014–June 2015. Carlsbad, NM: Carlsbad Field Office. DOE/WIPP 16-3559.*

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

U.S. Environmental Protection Agency (EPA). 2018. Letter from Lee Veal (EPA, Director, Radiation Protection Division) to Todd Shrader (DOE, Manager, Carlsbad Field Office) regarding the September 29, 2017 Planned Change Notice Regarding the Excavation and Construction of a New Ventilation Shaft and Associated Access Drifts at the Waste Isolation Pilot Plant (WIPP), January 22, 2018.*

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