40 CFR Part 191
Subparts B and C
Compliance Recertification Application 2026
for the
Waste Isolation Pilot Plant

Results of Compliance Assessments
(40 CFR 194.55)

United States Department of Energy
Waste Isolation Pilot Plant

Carlsbad Field Office
Carlsbad, New Mexico

Compliance Recertification Application 2026
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ACRONYMS AND ABBREVIATIONS

CCA	Compliance Certification Application
CFR	Code of Federal Regulations
CRA	Compliance Recertification Application
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
mrem	millirem
USDW	underground source of drinking water
WIPP	Waste Isolation Pilot Plant

55.0 RESULTS OF COMPLIANCE ASSESSMENTS (40 CFR 194.55)

55.1 Requirements

§ 194.55 Results of Compliance Assessments

(a) Compliance assessments shall consider and document uncertainty in the performance of the disposal system.

(b) Probability distributions for uncertain disposal system parameter values used in compliance assessments shall be developed and documented in any compliance application.

(c) Computational techniques which draw random samples from across the entire range of values of each probability distribution developed pursuant to paragraph (b) of this section shall be used to generate a range of:

(1) Estimated committed effective doses received from all pathways pursuant to § 194.51 and § 194.52;

(2) Estimated radionuclide concentrations in USDWs pursuant to § 194.53; and

(3) Estimated dose equivalent received from USDWs pursuant to § 194.52 and § 194.53.

(d) The number of estimates generated pursuant to paragraph (c) of this section shall be large enough such that the maximum estimates of doses and concentrations generated exceed the 99th percentile of the population of estimates with at least a 0.95 probability.

(e) Any compliance application shall display:

(1) The full range of estimated radiation doses; and

(2) The full range of estimated radionuclide concentrations.

(f) Any compliance application shall document that there is at least a 95 percent level of statistical confidence that the mean and the median of the range of estimated radiation doses and the range of estimated radionuclide concentrations meet the requirements of § 191.15 and part 191, subpart C of this chapter, respectively.

55.2 Background

The individual and groundwater protection requirements of 40 Code of Federal Regulations (CFR) 191.15 and 40 CFR Part 191 Subpart C (U.S. EPA 1993) place limitations on both the potential radiation exposure of individuals and the possible levels of radioactive contamination of groundwater caused by disposal of waste in the Waste Isolation Pilot Plant (WIPP). The criteria for compliance are provided in 40 CFR 194.51 through 194.55 (U.S. EPA 1996). The individual protection requirement focuses on the annual radiation dose of a maximally exposed person living on the surface just outside the Land Withdrawal Act boundary. In particular, 40 CFR 191.15 requires that the WIPP be constructed in such a manner as to provide a reasonable expectation that, for 10,000 years after disposal, undisturbed performance of the disposal system will not cause the annual committed effective dose equivalent (hereafter called “dose”) from all potential exposure pathways to exceed 15 millirems (mrem) (150 microsieverts) to any member of the public in the accessible environment. Part 191 Subpart C also requires that underground sources of drinking water (USDWs) be protected at least to the extent prescribed by the National Primary Drinking Water Regulations at 40 CFR Part 141 (U.S. EPA 2003) as they existed on January 19, 1994 (per 40 CFR 191.24(a)(1)).

The U.S. Environmental Protection Agency (EPA) reviewed the U.S. Department of Energy's (DOE's) 2019 Compliance Recertification Application (CRA-2019) and found that the results continue to demonstrate compliance with these requirements of 40 CFR 194.55 (U.S. EPA 2022). The EPA did not receive any public comments on the DOE's continued compliance with 40 CFR 194.55.

Information and data from previous compliance certification and recertification applications, which form the basis of past DOE compliance positions, are found in the CRA-2019 (U.S. DOE 2019) and its predecessors.

55.3 Changes or New Information Since the CRA-2019

The DOE's methodology for demonstrating compliance with 40 CFR 194.55 has not changed since the Compliance Certification Application (CCA) (U.S. DOE 1996). Updates to the USDW parameters are included in Appendix IGP-2026. During the compliance assessment, the DOE used a bounding analysis, applying assumptions that overestimate potential radiation doses and contaminant concentrations. For the CRA-2026, no vectors in the undisturbed scenario passed the performance assessment screening criteria[1] meaning all vectors had zero concentrations of actinides in the anhydrite interbeds at the accessible environment. Given that the maximum concentration of radionuclides shown to reach the accessible environment in the CRA-2026 analysis is zero, the resulting potential doses to the receptor would be below the 15-mrem standard. Appendix IGP-2026 documents the DOE's continued compliance with the individual and groundwater protection requirements. Compliance with the various subsections of 40 CFR 194.55 is demonstrated as follows:

- As indicated in Appendix IGP-2026, Section IGP-2.1, parameter uncertainty is discussed in Feng and Kicker 2025, demonstrating compliance with 40 CFR 194.55(b).
- Appendix IGP-2026, Section IGP-2.2 describes how the DOE calculates the effective dose and dose equivalent as required by 40 CFR 194.55(c).
- Appendix IGP-2026, Section IGP-2.3 also explains that the DOE's selection of more than 298 sampled vectors fulfills the requirements of 40 CFR 194.55(d).
- Appendix IGP-2026, Sections IGP-2.1 and 2.2 demonstrate that the DOE considered the full range of estimated radionuclide concentrations and radiation doses as required by 40 CFR 194.55(e).
- Appendix IGP-2026, Section IGP-2.3 demonstrates that the DOE's bounding analysis approach meets the requirements of 40 CFR 194.55(f).

[1] Vector tracer accumulated releases less than 10^{-7} kg at 10,000 years are screened out of performance assessment calculations. Screened out vectors are assigned a concentration of zero (Docherty and Kim 2025, Section 5.3.2).

Based on this information, the DOE believes that continued compliance with 40 CFR 194.55 is demonstrated.

55.4 References

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

Docherty, P.C., and S. Kim. 2025. Analysis Report for Actinide Mobilization and Salado Transport in the 2026 Compliance Recertification Application Performance Assessment: Interim State Repository, Revision 0. Carlsbad, NM: Sandia National Laboratories.*

Feng, L.M., and D.C. Kicker. 2025. Input Parameter Report for the 2026 Compliance Recertification Application Performance Assessment: Interim State Repository, Revision 0. Carlsbad, NM: Sandia National Laboratories.*

U.S. Department of Energy (U.S. DOE). 1996. Title 40 CFR Part 191 Compliance Certification Application for the Waste Isolation Pilot Plant (October). Carlsbad, NM: Carlsbad Area Office. DOE/CAO-1996-2184.

U.S. DOE. 2019. Title 40 CFR 191 Subparts B and C Compliance Recertification Application 2019 for the Waste Isolation Pilot Plant (March). Carlsbad, NM: Carlsbad Field Office. DOE/WIPP-2019-3609.*

U.S. Environmental Protection Agency (U.S. EPA). 1993. 40 CFR Part 191 Environmental Radiation Protection Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes: Final Rule. *Federal Register,* vol. 58 (December 20, 1993): 66398–66416.

U.S. 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. EPA. 2003. 40 CFR Part 141: National Primary Drinking Water Regulations: Final Rule. *Federal Register*.

U.S. EPA. 2022. Section 55 Results of Compliance Assessments. 2019 Compliance Recertification Application Review Document (CARD) (April) (pp. 79 through 80). Washington, DC: Office of Radiation and Indoor Air.*