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

Monitoring
(40 CFR § 194.42)

United States Department of Energy
Waste Isolation Pilot Plant

Carlsbad Field Office
Carlsbad, New Mexico

Compliance Recertification Application 2026
Monitoring
(40 CFR § 194.42)

TABLE OF CONTENTS

42.0 MONITORING (40 CFR § 194.42) 42-1
42.1 Requirements 42-1
42.2 Background 42-2
42.3 Changes or New Information Since the CRA-2019 42-2
42.4 References 42-3

ACRONYMS AND ABBREVIATIONS

CFR	Code of Federal Regulations
CMP	Compliance Monitoring Program
CRA	Compliance Recertification Application
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
PA	Performance Assessment
WIPP	Waste Isolation Pilot Plant

42.0 MONITORING (40 CFR § 194.42)

42.1 Requirements

§ 194.42 Monitoring

(a) The Department shall conduct an analysis of the effects of disposal system parameters on the containment of waste in the disposal system and shall include the results of such analysis in any compliance application. The results of the analysis shall be used in developing plans for pre-closure and post-closure monitoring required pursuant to paragraphs (c) and (d) of this section. The disposal system parameters analyzed shall include, at a minimum:

(1) Properties of backfilled material, including porosity, permeability, and degree of compaction and reconsolidation;

(2) Stresses and extent of deformation of the surrounding roof, walls, and floor of the waste disposal room;

(3) Initiation or displacement of major brittle deformation features in the roof or surrounding rock;

(4) Ground water flow and other effects of human intrusion in the vicinity of the disposal system;

(5) Brine quantity, flux, composition, and spatial distribution;

(6) Gas quantity and composition; and

(7) Temperature distribution.

(b) For all disposal system parameters analyzed pursuant to paragraph (a) of this section, any compliance application shall document and substantiate the decision not to monitor a particular disposal system parameter because that parameter is considered to be insignificant to the containment of waste in the disposal system or to the verification of predictions about the future performance of the disposal system.

(c) Pre-closure monitoring. To the extent practicable, pre-closure monitoring shall be conducted of significant disposal system parameter(s) as identified by the analysis conducted pursuant to paragraph (a) of this section. A disposal system parameter shall be considered significant if it affects the system's ability to contain waste or the ability to verify predictions about the future performance of the disposal system. Such monitoring shall begin as soon as practicable; however, in no case shall waste be emplaced in the disposal system prior to the implementation of pre-closure monitoring. Pre-closure monitoring shall end at the time at which the shafts of the disposal system are backfilled and sealed.

(d) Post-closure monitoring. The disposal system shall, to the extent practicable, be monitored as soon as practicable after the shafts of the disposal system are backfilled and sealed to detect substantial and detrimental deviations from expected performance and shall end when the Department can demonstrate to the satisfaction of the Administrator that there are no significant concerns to be addressed by further monitoring. Post-closure monitoring shall be complementary to monitoring required pursuant to applicable federal hazardous waste regulations at parts 264, 265, 268, and 270 of this chapter and shall be conducted with techniques that do not jeopardize the containment of waste in the disposal system.

(e) Any compliance application shall include detailed pre-closure and post-closure monitoring plans for monitoring the performance of the disposal system. At a minimum, such plans shall:

(1) Identify the parameters that will be monitored and how baseline values will be determined;

(2) Indicate how each parameter will be used to evaluate any deviations from the expected performance of the disposal system; and

(3) Discuss the length of time over which each parameter will be monitored to detect deviations from expected performance.

42.2 Background

In Title 40 Code of Federal Regulations (CFR) 194.42 (U.S. EPA 1996), the U.S. Environmental Protection Agency (EPA) provides criteria to demonstrate compliance with the assurance requirement of 40 CFR 191.14(b) (U.S. EPA 1993) to monitor the Waste Isolation Pilot Plant (WIPP) disposal system. The purpose of this monitoring is "to detect substantial and detrimental deviations from expected performance," with the expected performance predicted by the performance assessment (PA). The criteria also require both a pre-closure and post-closure monitoring program using techniques that do not jeopardize the containment of waste in the disposal system. Ten monitoring parameters were identified in an analysis performed to fulfill the 40 CFR 194.42 requirement in the initial Compliance Certification Application (U.S. DOE 1996).

A detailed description of the 40 CFR 194.42 Compliance Monitoring Program (CMP) may be found in the U.S. Department of Energy (DOE) Compliance Monitoring Implementation Plan (U.S. DOE 2023); the 2004 Compliance Recertification Application (CRA-2004) (U.S. DOE 2004), Chapter 7.0, Section 7.2; the CRA-2009, Appendix MON-2009 (U.S. DOE 2009); the CRA-2014, Appendix MON-2014 (U.S. DOE 2014); the CRA-2019, Appendix MON-2019 (U.S. DOE 2019); and Appendix MON-2026.

42.3 Changes or New Information Since the CRA-2019

The CMP implements the requirements of 40 CFR 194.42, and the DOE continues to monitor the disposal system parameters to detect substantial and detrimental deviations from expected performance. The DOE has continued to monitor and evaluate the 10 monitoring parameters. The 10 parameters, their associated monitoring programs, the frequency of data collection and reporting, related PA parameters, and related screening decisions used to support the PA are listed in Appendix MON-2026, Table MON-1. These parameters were evaluated, and it was determined that no changes have occurred that would affect the PA-related parameters; conceptual models; or features, events, and processes screening decisions (Kicker 2023; Kicker 2025).

Since the DOE did not make any changes to the CMP or activities associated with the monitoring program, there are no changes to report in relation to the requirements of 40 CFR 194.42.

New monitoring information that supplements what was provided since the last recertification cycle includes the following:

1. Monitoring results for the 10 parameters since CRA-2019 are contained in Appendix DATA-2026.

2. The reassessment of the parameters to determine if there is an impact on the PA-related parameters; conceptual models; or features, events, and processes screening decisions are contained in Kicker (2023) and Kicker (2025).

The information presented in this section, along with Appendix MON-2026 and Appendix DATA-2026, demonstrates continued compliance with the requirements of 40 CFR 194.42.

42.4 References

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

Kicker, D. 2023. Reassessment of MONPAR Analysis for Use in the 2024 Compliance Recertification Application. Carlsbad, NM: Sandia National Laboratories. ERMS 580001.*

Kicker, D. 2025. Reassessment of MONPAR Analysis for Use in the 2026 Compliance Recertification Application. May 19, 2025. Carlsbad, NM: Sandia National Laboratories.*

U.S. Department of Energy (DOE). 1996. Title 40 CFR Part 191 Compliance Certification Application for the Waste Isolation Pilot Plant (October). 21 vols. Carlsbad, NM: Carlsbad Field Office. DOE/CAO-1996-2184.

U.S. DOE. 2004. Title 40 CFR Part 191 Compliance Recertification Application for the Waste Isolation Pilot Plant (March). 10 vols. Carlsbad, NM: Carlsbad Field Office. DOE/WIPP 2004-3231.

U.S. DOE. 2009. Title 40 CFR Part 191 Compliance Recertification Application for the Waste Isolation Pilot Plant (March). Carlsbad, NM: Carlsbad Field Office. DOE/WIPP-09-3424.

U.S. DOE. 2014. Title 40 CFR Part 191 Subparts B and C. Compliance Recertification Application for the Waste Isolation Pilot Plant (March). Carlsbad, NM: Carlsbad Field Office. DOE/WIPP 2014-3503.

U.S. DOE. 2019. Title 40 CFR Part 191 Subparts B and C. Compliance Recertification Application for the Waste Isolation Pilot Plant (March). Carlsbad, NM: Carlsbad Field Office. DOE/WIPP-19-3609.*

U.S. DOE. 2023. Compliance Monitoring Implementation Plan for 40 CFR 191.14(b), Assurance Requirement (May 25, Revision 9). Carlsbad, NM: Carlsbad Field Office. DOE/WIPP-99-3119.*

U.S. Environmental Protection Agency (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.