
**Title 40 CFR Part 191
Subparts B and C
Compliance Recertification Application 2019
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 2019
Monitoring
(40 CFR § 194.42)

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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

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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 40 CFR §194.42 ([U.S. EPA 1996](#)), the U.S. Environmental Protection Agency (EPA) provides criteria to demonstrate compliance with the assurance requirement at 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 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 during the original certification process ([U.S. DOE 1996](#)). More detailed information describing the 40 CFR § 194.42 Compliance Monitoring Program (CMP) is located in the U.S. Department of Energy (DOE) Compliance Monitoring Implementation Plan ([U.S. DOE 2014a](#)); the 2004 Compliance Recertification Application (CRA-2004) ([U.S. DOE 2004](#)), Chapter 7.0, Section 7.2; Appendix MON-2009 ([U.S. DOE 2009](#)); Appendix MON-2014 ([U.S. DOE 2014b](#)) and Appendix MON-2019.

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

42.3 Changes or New Information Since the CRA-2014

The CMP implements the requirements of 40 CFR § 194.42, and the program continues to monitor the WIPP to detect substantial and detrimental deviations from expected performance. The results of this program have not indicated such a condition. 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-2019, Table MON-1. These parameters were evaluated and it was determined that no changes have occurred that will have an impact on the PA-related parameters, conceptual models, or features, events, and processes screening decisions ([Wagner 2018](#)).

DOE did not change its pre-closure or post-closure program plans and activities relative to the monitoring program, so there are no changes to report for the requirements of 40 CFR § 194.42(b), (c), (d), or (e).

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

1. Monitoring results for the 10 parameters since CRA-2014 are contained in Appendix DATA-2019
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 contained in [Wagner 2018](#).

DOE believes the information presented in this section, along with Appendix MON-2019 and Appendix DATA-2019, continues to demonstrate compliance with the provisions of 40 CFR § 194.42.

42.4 References

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

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. Department of Energy (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. Department of Energy (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. Department of Energy (DOE). 2014a. Compliance Monitoring Implementation Plan for 40 CFR 191.14(b), Assurance Requirement (October 2014, Revision 8). Carlsbad, NM: Carlsbad Field Office. DOE/WIPP 99-3119.*

U.S. Department of Energy (DOE). 2014b. 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. 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): 66398–416.

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.

Wagner, S.W. 2018. Reassessment of MONPAR Analysis for Use in the 2019 Compliance Recertification Application. Carlsbad, NM: Sandia National Laboratories. ERMS 569616.*