Table of Contents

List of Figures

List of Tables

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7.0 ASSURANCE REQUIREMENTS

In the Preamble to Title 40 of the Code of Federal Regulations (CFR) Part 191 (EPA 1985) (50 FR 30879), the U.S. Environmental Protection Agency (EPA) points out that:

> There are too many uncertainties in projecting the behavior of natural and engineered components for many thousands of years—and too many opportunities for mistakes or poor judgments in such calculations—for the numerical requirements on overall system performance in Subpart B to be the sole basis to determine the acceptability of disposal systems for these very hazardous wastes.

In view of this, the EPA developed assurance requirements (40 CFR § 191.14) to ensure that implementing agencies act cautiously and take steps to reduce the impacts of these uncertainties. According to the EPA, these assurance requirements are considered an essential complement to the containment requirements, which, when implemented, should ensure that the level of protection desired by the EPA is achieved. Contained in 40 CFR § 191.14 are these six separate assurance requirements:

- active institutional controls,
- monitoring,
- passive institutional controls,
- use of different types of barriers,
- resource disincentives, and
- waste removal.

Figure 7-1 provides a timeline illustrating the implementation of these assurance requirements. Waste removal is not included in Figure 7-1 because it is not a planned activity. Waste removal is discussed in ***CCA*** Appendix WRAC. See Table 1-7 ~~in Chapter 1.0~~ for a list of appendices that provide additional information supporting this chapter.

The provisions of 40 CFR 194 (EPA 1996a) contain detailed criteria that the U.S. Department of Energy (DOE) is to use in implementing the assurance requirements contained in 40 CFR 191. The following sections detail the DOE's compliance with the assurance requirements of 40 CFR 191 and the associated certification criteria in 40 CFR 194. In addition to addressing the six assurance requirements stated above, the DOE used some conservative assumptions in the performance assessment that provide additional assurance. Use of conservative assumptions is discussed in Section 6.5.4.

7.1 Active Institutional Controls

Active institutional controls and passive institutional controls satisfy two roles:

(1) they meet assurance requirements per 40 CFR 191 and 194, and

(2) they contribute to performance assessment per 40 CFR 194.

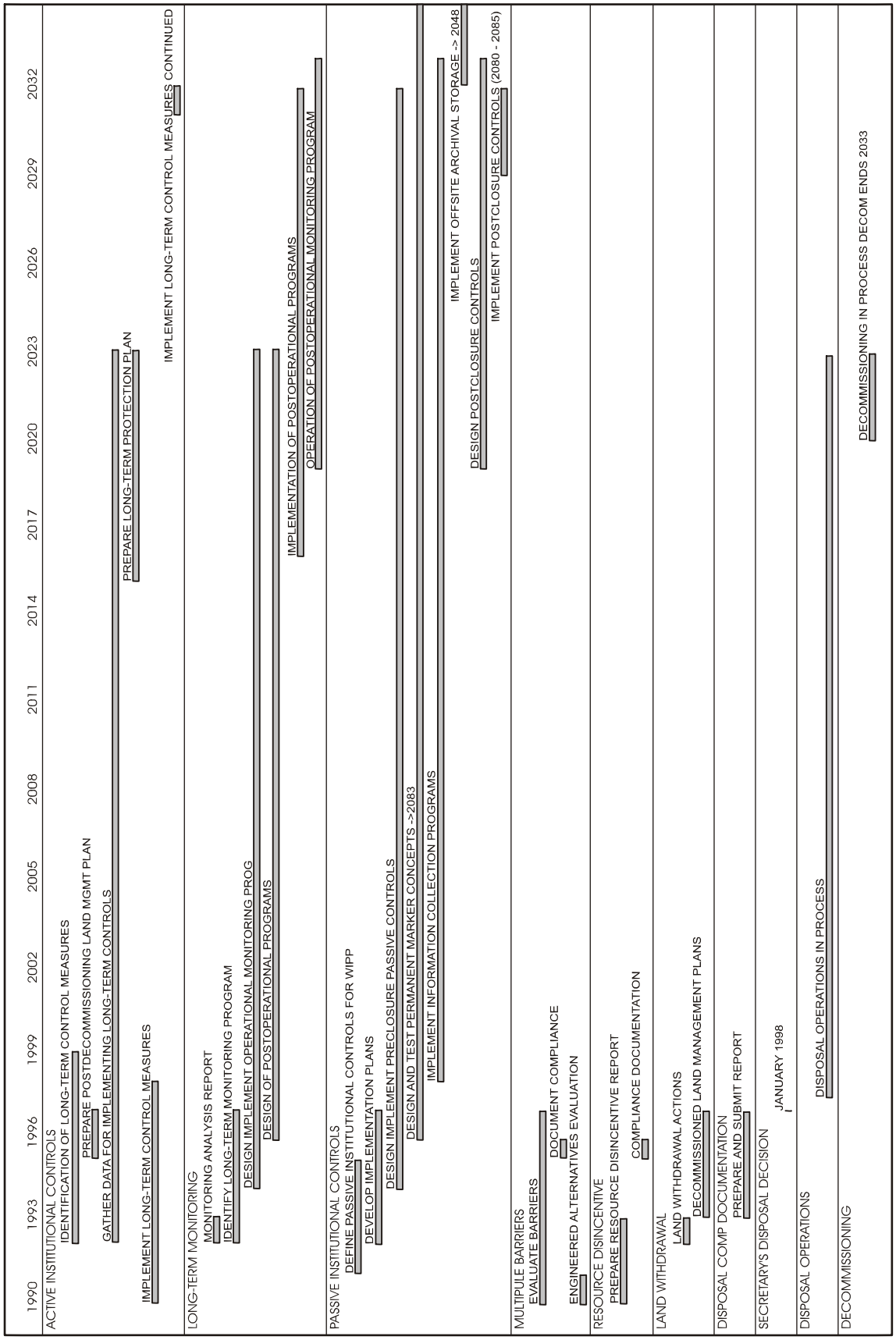

Figure 7-1. Implementation Timeline

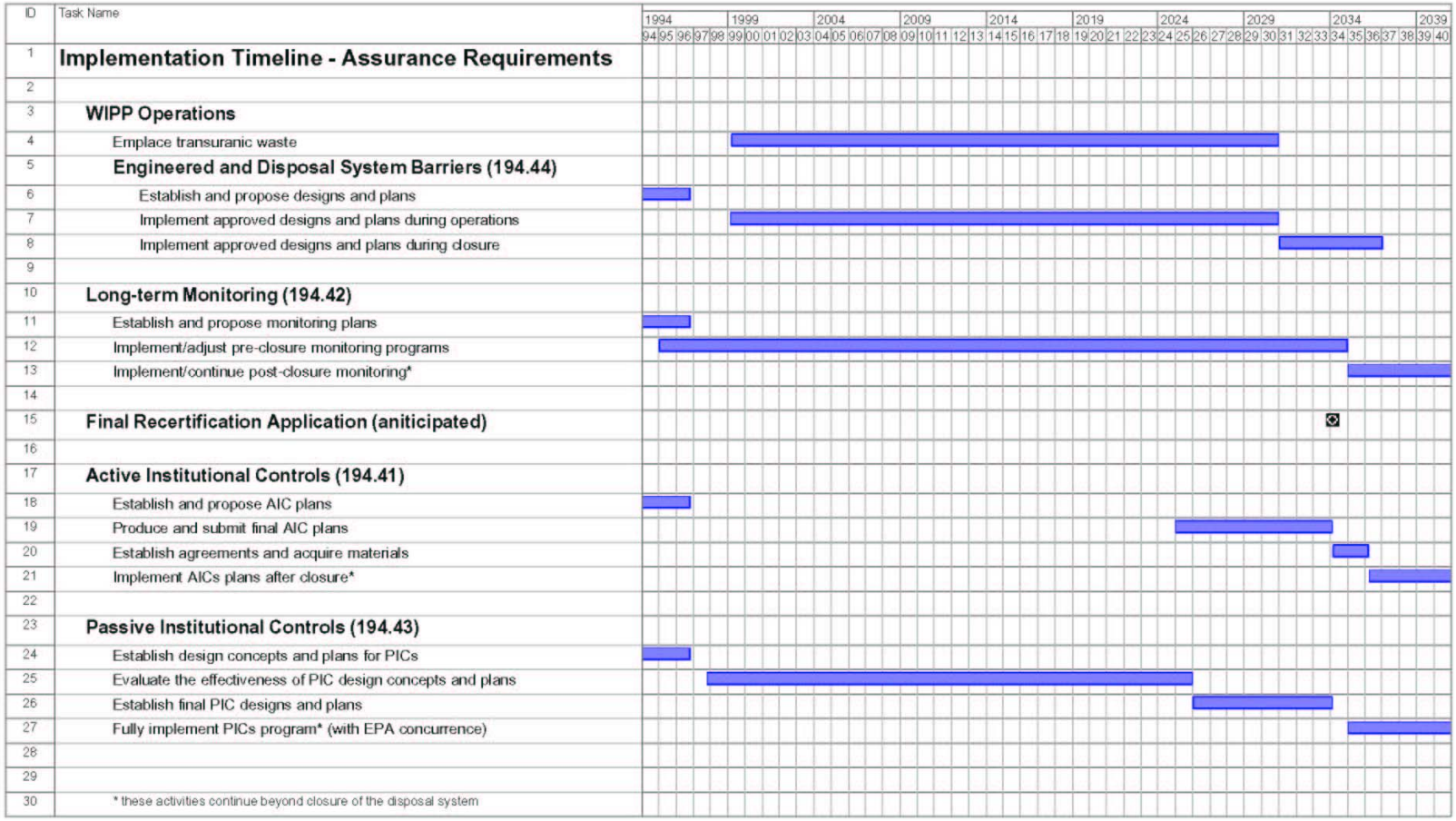

Figure 7-1. Implementation Timeline – Assurance Requirements

Once the facility at the Waste Isolation Pilot Plant (WIPP) is decommissioned and decontaminated (D&D), positive actions (active institutional controls) will be taken to ensure site access control. Active institutional controls begin after final facility closure. The EPA has specified that no more than 100 years of active institutional controls can be assumed in predictions of long-term performance. The DOE interprets this requirement to mean that control programs should be implemented as long as such controls are useful and practical, but credit for active institutional controls cannot be considered in the performance assessment beyond 100 years from the final closure of the repository. Therefore, performance assessment does not consider credit for active institutional controls beyond 100 years.

The EPA defines active institutional controls as "(1) controlling access to a disposal site by any means other than passive institutional controls, (2) performing maintenance operations or remedial actions at the site, (3) controlling or cleaning up releases from a site, or (4) monitoring parameters related to disposal system performance" (40 CFR § 191.12). Active institutional controls to be used by the DOE include facility guarding, evaluation of land use in the area, postoperational monitoring, land reclamation, and maintenance of fences and buildings. In addition, active institutional controls are integrated with the D&D activities described in ***CCA*** Appendix D&D. ***That appendix remains unchanged and, therefore, is not included in this recertification application.***

During the rulemaking process for the original WIPP certification, the DOE developed and provided the following to the EPA:

(1) detailed information regarding the schedule for implementing the active institutional controls,

(2) DOE's approach to maintaining and replacing active institutional controls, and

(3) minimum standards that will be applied during construction and maintenance of the active institutional controls.

This information was provided to the EPA via letter dated February 7, 1997 (Docket A-93-02, Item II-I-07, Enclosure 1c).

The DOE also provided sample inspection checklists for site surveillance and maintenance and a discussion of training requirements that will be applied to site patrol personnel. The DOE conducted a "capabilities survey" of regional security firms and concluded that the surveillance requirements for the WIPP site were within the scope of current local capabilities. The EPA contacted the Eddy County Sheriff's Office and confirmed that, while the Sheriff's Office may be able to patrol the site after closure, the services of a private firm would have to be contracted for routine patrols. On the basis of the documentation provided by the DOE, the EPA found the active institutional controls plans to be adequate and that the implementation may be effective for 100 years after disposal (63 FR 27395; see also CARD 41 located in EPA Docket A-93-02, Item V-B-2).

7.1.1 Requirements for Active Institutional Controls

In prescribing active institutional controls, the EPA has specified that "active institutional controls over disposal sites should be maintained for as long a period of time as is practicable after disposal" (40 CFR § 191.14[a]). The EPA addresses the effectiveness of these controls and the length of the time for which such controls should be considered effective for the performance assessment.

Section 194.41(a) specifies that "any compliance application shall include detailed descriptions of proposed active institutional controls, the controls' location, and the period of time the controls are proposed to remain active." Section 194.41(a) also states that any assumptions pertaining to the effectiveness of active controls in preventing inadvertent human intrusion should be supported by such descriptions. This section provides support for the assumptions pertaining to the active institutional controls program for the WIPP facility. Prior to decommissioning of the facility and full implementation of the active controls program, the DOE will reevaluate the proposed active controls program and make any changes necessary as indicated by experience and evaluation of data. The design of the DOE's active controls program is described in ***CCA*** Appendix AIC.

For the purposes of this application, the DOE will begin the active controls period within sixty days of completion of final facility closure. ~~This start point will be simultaneous with the initiation of the postclosure care period mandated under the closure plan submitted to the New Mexico Environment Department (NMED) with the hazardous waste facility permit application.~~

7.1.2 Objectives for Active Institutional Controls

The primary goal of DOE's active institutional controls program is to prevent unauthorized use of the WIPP site. Because of the massive body of rock that separates the waste from the accessible environment, there are not many activities that pose a threat to the WIPP disposal system. The threats that are severe enough or likely enough to consider are addressed in Appendix ***PA, Attachment*** SCR and in the conceptual models description located in Section 6.4. The DOE has identified four objectives for the design of the active controls program: (1) eliminating those site features that would cause future populations to develop the WIPP site (see Section 7.1.3.1), (2) identifying allowed and disallowed activities, (3) identifying and minimizing the impacts of the intentional user, and (4) controlling allowed activities and preventing unallowed activities. In addition, the DOE will install and protect monitoring equipment and any test facilities established for evaluating the long-term marker system.

In order to design an active controls program around these four objectives, the DOE has assumed the following:

- site restoration will be to as near the original condition as practicable,
- future authorized site uses will not be significantly different than they are now, as described in ***CCA*** Appendix LMP, and
- a threat of future unauthorized use exists.

The WIPP Land Management Plan (LMP) (DOE/WIPP 93-004) provides guidance for managing the land withdrawn for the WIPP through project decommissioning. Active institutional controls are implemented after decommissioning and, by definition, the LMP is not part of the WIPP active institutional controls program. A planned change pursuant to 40 CFR § 194.4(b)(3) was submitted to the EPA in January 2002 requesting removal of CCA Appendix LMP from the Compliance Baseline. In a letter sent to the DOE dated March 15, 2002 (Marcinowski to Triay; EPA Docket A-98-49, II-B-3, Item 24), the EPA approved the planned change allowing CCA Appendix LMP to be eliminated from future recertification applications.

Restoration of the WIPP site includes any activities associated with demobilization following D&D. In addition, as part of the active institutional controls program, the DOE will implement monitoring systems suitable for assessing disposal system performance. The objectives of the active institutional controls program, the monitoring program, and the decommissioning plan overlap; therefore, the DOE believes it is both prudent and within the EPA's intent to conduct these programs simultaneously. This provides for a more comprehensive understanding of the multitude of activities that will be taking place during the active controls period.

7.1.3 Implementation of the Active Institutional Controls Program

The first step in the process of implementing the active institutional controls program was to identify measures needed to satisfy the active institutional controls requirements. Certain characteristics of active institutional controls measures have been identified, such as minimizing features that would attract future development of the site, warning of potential hazards through signage, implementing the measures for at least 100 years, addressing the standards, and preventing development. These characteristics were used to develop conceptual designs for active institutional controls.

Some active institutional controls were obvious at the outset, including site access control, site remedial actions, site maintenance, and site monitoring. Information and specifications useful in implementing these and possibly other controls have been gathered ~~(see Appendix LMP)~~. A detailed explanation of the resulting active institutional controls is provided in ***CCA*** Appendix AIC (Section 2). The ~~design~~ ***plan*** will be reviewed periodically and updated as appropriate during WIPP's operations phase. Ongoing review and evaluation will ensure that the active institutional controls implemented are appropriate for the conditions that may exist at that time. The DOE will review the design prior to implementation, and should it be determined the design should be modified, the changes shall be reported per the change requirements at 40 CFR § 194.4.

The final operational activity at the repository will be closing the waste disposal area and sealing the shafts. All surface structures, except for the concrete hot cell structure (***CCA*** Appendix AIC), and a sufficient quantity of salt tailings to support construction of the permanent marker berm (***CCA*** Appendix PIC) will be removed and the site regraded and revegetated to as near its original condition as practicable. ~~In addition, those structures erected during the disposal phase, as part of the permanent marker testing program (Section 7.3.3.2), will also remain in place after decommissioning. These will include a section of the berm, the salt filled trench that will serve~~

~~as the berm base, and at least one monument marker used in long-term materials testing for the permanent marker system.~~

In order to determine the active controls that would be beneficial, the DOE analyzed the types of land uses anticipated and, based on that analysis, developed a design plan for active institutional controls. The following two sections summarize the analysis and the design plan.

7.1.3.1 Analysis of Activities

The purpose of the analysis of activities is to determine the types of disturbances that may be associated with each activity, the depth of such disturbances, and the need for any mitigation of these activities. These activities are supported with screening decisions in Appendix ***PA, Attachment*** SCR. This section addresses the following activities:

- ranching,
- farming,
- hunting,
- scientific activities,
- utilities and transportation,
- groundwater pumping,
- surface excavation,
- potash exploration,
- hydrocarbon exploration,
- construction, and
- hostile and illegal activities.

Table 7-1 indicates the active institutional controls that will be applied to prevent unauthorized activities.

7.1.3.1.1 Ranching

Description of the Activity: Ranching involves the management of herds of cattle on the public lands surrounding and including the WIPP. These activities are regulated on federal lands such as the WIPP under a permitting process administered by the Bureau of Land Management (BLM). There is little surface-disturbing activity associated with ranching except for the construction of fences, the construction and operation of watering facilities, and the occasional drilling of groundwater wells. Currently, only the 277 acres within the Exclusive Use Area are

Table 7-1. Effectiveness of Active Controls Activities

Activities Active Institutional Controls	Ranching	Farming	Hunting	Scientific Activities	Utilities and Transportation	Groundwater Pumping	Excavation	Potash Exploration	Hydrocarbon Exploration	Construction	Hostile and Illegal Activities
Land Management Plan											
Fence											
Roadway											
Signs											
Contract for Inspection and Maintenance											
Security Surveillance											
Testing											
Disposal System Monitoring											
Permanent Marker System Installation											
Response											
Reporting											

indicates component addressed by active controls

not used for ranching. In the future, barbed wire enclosures will be constructed to provide security for monitoring facilities, test areas, and construction areas. Eventually, the entire surface is expected to be released for ranching activities. Only those activities associated with groundwater use could have any impact on the disposal system. These are discussed in Section 7.1.3.1.6. Figure 7-2 depicts the current grazing allotments on the WIPP site.

Goal of Active Controls: Active controls will ensure that grazing leases are administered consistently and in compliance with applicable regulations. Fencing will be needed to protect government property. In addition, areas will be fenced as needed to prevent cattle from disturbing reclaimed areas until vegetation has been reestablished.

7.1.3.1.2 Farming

Description of the Activity: Farming includes soil preparation, planting, irrigation, and harvesting. Significant quantities of water are needed to support crops in the Delaware Basin.