DOE/RW-0160

Chapter 8

Nuclear Waste Policy Act
(Section 113)

Section 8.3

Consultation Draft

PLANNED TESTS, ANALYSES, AND STUDIES

Site Characterization Plan

Yucca Mountain Site, Nevada Research and Development Area, Nevada

Volume IV

January 1988

U.S. Department of Energy
Office of Civilian Radioactive Waste Management
Washington, DC 20585

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8.3 PLANNED TESTS, ANALYSES, AND STUDIES

This section describes the planned site characterization studies, and the design and performance assessment activities to be conducted during site characterization at the Yucca Mountain site. Additional details on the planned field tests and laboratory tests will be provided in study plans. The current list of study plans with estimated dates for completion is provided in Section 8.5.1.

For the repository, seal, and waste package programs, only those activities requiring site data are described in detail in this document. Additional detail will be provided in appropriate design-related documents. In the case of performance assessment activities, sufficient detail is provided to document the site-data requirements. As described in Sections 8.1 and 8.2, performance allocation was used to identify both design and performance assessment data needs.

Section 8.3.1 presents the site program. It is divided into seventeen subsections (8.3.1.1 through 8.3.1.17) representing the major topical areas for which site data needs have been identified. Section 8.3.2 describes the repository program; the section begins with an overview of the repository program (8.3.2.1), followed by discussions of the issue resolution strategies for four design issues (8.3.2.2--Issue 1.11 on configuration of underground facilities (postclosure); 8.3.2.3--Issue 2.7 covering repository design criteria for radiological safety; 8.3.2.4--Issue 4.2 on nonradiological health and safety of repository workers; and 8.3.2.5--Issue 4.4 covering preclosure design and technical feasibility).

Section 8.3.3 describes the seal program; an overview is provided (8.3.3.1), followed by a discussion of the issue resolution strategy for Issue 1.12, addressing shaft, exploratory, and borehole seal characteristics (8.3.3.2). Section 8.3.4 presents the waste package program; Section 8.3.4.1 provides an overview of the waste package program, and the remaining sections present issue resolution strategies for three of the issues related to waste package design and analyses. Section 8.3.4.2 presents Issue 1.10, which addresses postclosure waste package characteristics; Section 8.3.4.3 addresses preclosure waste package characteristics (Issue 2.6); and Section 8.3.4.4 addresses waste package production technologies (Issue 4.3).

Section 8.3.5 presents the performance assessment program for both pre- and postclosure. The first section (8.3.5.1) is an overview of the preclosure performance assessment strategy. Section 8.3.5.2 addresses Issue 2.4, presenting the issue resolution strategy for the performance objective for waste retrievability. The next three sections (8.3.5.3 through 8.3.5.5) present issue resolution strategies for the issues related to radiological safety requirements for repository workers and the public. Sections 8.3.5.6 and 8.3.5.7 present the issues that cover the requirements for higher level findings on the DOE general siting guidelines for preclosure radiological safety and ease and cost of siting, construction, operation, and closure (Issues 2.5 and 4.1, respectively).

An overview of the postclosure performance assessment strategy is presented in Section 8.3.5.8. Sections 8.3.5.9 and 8.3.5.10 provide issue

resolution strategies for the performance objectives for waste package containment (Issue 1.4) and engineered barrier system performance (Issue 1.5). Section 8.3.5.11 is a discussion of the plans for assessing the performance of the seal system, while Section 8.3.5.12 presents the performance objective for pre-waste-emplacement ground-water travel time (Issue 1.6). Section 8.3.5.13 addresses the issue resolution strategy for the performance objective for the total repository system (Issue 1.1), and Sections 8.3.5.14 and 8.3.5.15 cover the individual protection requirements (Issue 1.2) and the requirement for protection of special sources of ground water (Issue 1.3). Section 8.3.5.16 presents a discussion of the requirements for performance confirmation (Issue 1.7), and Section 8.3.5.17 describes the issue resolution strategy for Issue 1.8, the NRC Siting Criteria. Section 8.3.5 18 addresses the requirement for higher level findings on the DOE general siting guidelines (Issue 1.9). The discussion of the analytical techniques already available and techniques requiring development are provided in the last two sections (8.3.5.19 and 8.3.5.20).

Table 8.3-1 provides an overview of the structure of Section 8.3 showing the order of the specific site programs in Section 8.3.1, and the performance and design issues covered in Sections 8.3.2 through 8.3.5.

Table 8.3-1. Overview of contents of Section 8.3 showing order of presentation of site programs and performance and design issues within major programs

Section 8.3.1 Site Program	Section 8.3.2 Repository Program	Section 8.3.3 Seal Program	Section 8.3.4 Waste Package Program	Section 8.3.5 Performance Assessment Program
8.3.1.2 Geohydrology	8.3.2.2 Configuration of underground facilities (postclosure), Issue 1.11	8.3.3.2 Seal characteristics (postclosure), Issue 1.12*	8.3.4.2 Waste package characteristics (postclosure) Issue 1.10	8.3.5.2 Waste retrievability, Issue 2.4
8.3.1.3 Geochemistry	8.3.2.3 Repository design criteria for radiological safety, Issue 2.7		8.3.4.3 Waste package characteristics (preclosure), Issue 2.6	8.3.5.3 Public radiological exposures--normal conditions, Issue 2.1
8.3.1.4 Rock characteristics	8.3.2.4 Nonradiological health and safety, Issue 4.2		8.3.4.4 Waste package production technologies, Issue 4.3	8.3.5.4 Worker radiological safety--normal conditions, Issue 2.2
8.3.1.5 Climatic change	8.3.2.5 Preclosure design and technical feasibility, Issue 4.4			8.3.5.5 Accidental Radiological releases, Issue 2.3
8.3.1.6 Erosion				8.3.5.6 Higher level findings--preclosure radiological safety, Issue 2.5
8.3.1.7 Dissolution				8.3.5.7 Higher level findings--preclosure system and technical guidelines, Issue 4.1
8.3.1.8 Postclosure tectonics				8.3.5.9 Waste package containment, Issue 1.4
8.3.1.9 Human interference				8.3.5.10 Engineered barrier system release rates, Issue 1.5
8.3.1.10 Population density				8.3.5.12 Ground-water travel time, Issue 1.6
8.3.1.11 Site ownership				8.3.5.13 Total system performance, Issue 1.1
8.3.1.12 Meteorology				8.3.5.14 Individual protection, Issue 1.2
8.3.1.13 Offsite installations				8.3.5.15 Ground-water protection, Issue 1.3
8.3.1.14 Surface characteristics				8.3.5.16 Performance confirmation, Issue 1.7
8.3.1.15 Thermal and mechanical rock properties				8.3.5.17 NRC Siting Criteria, Issue 1.8
8.3.1.16 Hydrology				8.3.5.18 Higher level findings--postclosure system and technical guidelines, Issue 1.9
8.3.1.17 Preclosure tectonics				

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