



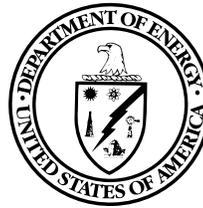
Final

Environmental Impact Statement

for a

Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada

Readers Guide



U.S. Department of Energy
Office of Civilian Radioactive Waste Management

DOE/EIS-0250

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WHY A READERS GUIDE?

The Proposed Action for this environmental impact statement (EIS) – to construct, operate and monitor, and eventually close a geologic repository for the disposal of spent nuclear fuel and high-level radioactive waste at Yucca Mountain in Nevada – is complex. The EIS evaluates not only impacts associated with constructing, operating, and closing a repository, but also those associated with transporting the materials to the Yucca Mountain Repository site. In addition to evaluating the near-term impacts of those activities, the EIS evaluates impacts that could occur hundreds of thousands of years in the future.

The No-Action Alternative is also complex, involving estimated impacts of allowing spent nuclear fuel and high-level radioactive waste to remain at 72 commercial and 5 U.S. Department of Energy (DOE, or the Department) sites across the United States.

In addition to the Draft EIS, DOE issued a Supplement to the Draft EIS. The Department received thousands of comments on the Draft EIS and the Supplement, and considered each comment in preparing the Final EIS. DOE has prepared this guide to help the reader understand the Final EIS, its different parts, and the approach the Department followed in moving from Draft EIS to Final EIS.

WHY DID DOE CHANGE THE EIS?

The Proposed Action for this EIS has not changed. With that in mind, and in accordance with Council on Environmental Quality regulations under the National Environmental Policy Act of 1969, as amended, DOE relied on three criteria for introducing changes to information presented in the Draft EIS and the Supplement to the Draft EIS in the preparation of this Final EIS. The Department changed the EIS (1) in response to public comments as appropriate, (2) to correct errors in the Draft EIS or the Supplement to the Draft EIS, and (3) to provide new information or improved analyses relevant to the EIS. For example, DOE changed the EIS to identify its preferred transportation mode (mostly rail nationally and in Nevada), to incorporate 2000 Census data, to address the final Environmental Protection Agency standards and Nuclear Regulatory Commission rule related to Yucca Mountain, and to add Appendix M to provide general transportation information not specifically related to the transportation analysis considered in Chapter 6 and Appendix J.

DOE issued the Draft EIS in August 1999 and requested comments on it. The Department received more than 11,000 comments in letters, e-mails, faxes, and transcripts of public hearings at 21 locations across the country. As described below, Volume III of this EIS contains all of those comments individually or in summary form, and the DOE responses to them. Some of those comments led DOE to change or update the EIS, primarily to enhance understanding, but also to correct errors that readers found.

In addition to errors pointed out by the public during the comment periods on the Draft EIS and the Supplement to the Draft EIS, DOE internal reviewers found typographical or editorial errors. These errors have been corrected in the Final EIS.

Finally, DOE has included new information and related analyses in the Final EIS. The primary example concerns the evolving nature of the repository design. In May 2001, DOE issued for public comment the Supplement to the Draft EIS to address the repository design evolution. This Final EIS incorporates the design information from the Supplement and, in some cases, updates that information. These changes occur throughout the EIS, but primarily in Chapters 2, 4, and 5. DOE made other changes to the EIS in response to the more than 1,900 public comments it received on the Supplement.

HOW DID DOE CHANGE THE EIS?

This Final EIS is based on the Draft EIS and the Supplement to the Draft EIS. Although not required by regulations, DOE has chosen to indicate substantive changes (additions and deletions) to the scientific and technical analyses of impacts with “change bars” in the margins of the affected pages. These change bars indicate new or revised information acquired since the publication of the Draft EIS or the Supplement, information based on revised analyses, and information included as the result of public comments. DOE did not use change bars for editorial changes (including references) or rephrased (but technically unchanged) information from the Draft EIS or the Supplement to the Draft EIS.

As mentioned above, changes and updates to the EIS came about for a variety of reasons. The primary reason was the evolving nature of the repository design, which was the basis for the preparation of the Supplement to the Draft EIS. This Final EIS incorporates new analyses based on the flexible design higher- and lower-temperature repository operating modes introduced in the Supplement and now described in Chapter 2 and the resultant environmental impacts, as described in Chapters 4 (preclosure impacts) and 5 (postclosure impacts). The design evolution also affected the analyses described in Chapter 8 (cumulative impacts) and Chapter 6 (transportation impacts related to shipments of additional repository components and construction materials).

A number of commenters on the Draft EIS or on the Supplement to the Draft EIS requested DOE to make changes, and DOE did so where appropriate. However, some suggested changes were inappropriate because they would have introduced errors or because they were not germane to the Proposed Action. Other than the three types of changes described above, the Department did not alter the EIS.

The following list highlights areas of change incorporated in this Final EIS:

- More information regarding potential impacts, particularly impacts associated with transportation of spent nuclear fuel and high-level radioactive waste within Nevada
- Use of a “representative” fuel assembly in the accident analysis
- Use of updated data, particularly population data in the impact analyses
- A more detailed discussion of the issue of potential impacts associated with negative perceptions about the repository project
- Use of updated versions of computer models for assessing human health and transportation impacts
- Corrections or editorial changes for accuracy and clarity
- Addition of an appendix that contains general information about transportation of radioactive materials not specifically used in the analysis, but provided for public information
- Addition of the U.S. Fish and Wildlife Service Biological Opinion as an appendix to the Final EIS
- Addition of a Readers Guide to help readers understand the Final EIS

Readers will notice a change in the way this Final EIS presents references. In the Draft EIS, a reference appeared in the form, for example, DOE 1998a, p. 5. In the Final EIS, the same reference appears as DIRS 101779-DOE 1998, p. 5. Because of the large number of references cited in the Final EIS, DOE has introduced the Document Input Reference System (DIRS) to ensure that each citation is appropriate

and proper. In addition, to aid the reader, DOE decided to put the reference list for each chapter at the end of that chapter and to not use a single list (which appeared in the Draft EIS as Chapter 12).

WHAT DOES THE FINAL EIS LOOK LIKE?

This *Final Environmental Impact Statement for a Geologic Repository for the Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste at Yucca Mountain, Nye County, Nevada* has four parts:

- Readers Guide and Summary
- Volume I – Impact Analyses, Chapters 1 through 15
- Volume II – Appendixes A through O
- Volume III – Comment-Response Document
- Volume IV – Additional information available upon written request to the DOE EIS Document Manager.

The purpose of the Summary is to present a condensed discussion of the analyses and impacts related to the Proposed Action and the No-Action Alternative, derived from the descriptions in Volumes I and II and from comments and responses contained in Volume III. The Summary stresses the major conclusions, areas of controversy, and issues to be resolved.

In developing the outline for Volume I, DOE adapted the EIS outline suggested by the Council on Environmental Quality (see 40 CFR 1502.10). The EIS outline is as follows:

Chapter 1 – Purpose and Need for Agency Action – establishes the need for DOE to take action.

Chapter 2 – Proposed Action and No-Action Alternative – describes what DOE proposes to do and the alternative of not building and operating a repository at Yucca Mountain.

Chapter 3 – Affected Environment – presents information on the 13 resource areas that the Proposed Action could affect at Yucca Mountain and along potential transportation routes, and on the affected environment of commercial and DOE sites to provide an analytical basis for the No-Action Alternative.

Chapter 4 – Environmental Consequences of Repository Construction, Operation and Monitoring, and Closure – describes potential impacts of the Proposed Action described in Chapter 2 on the Yucca Mountain environment described in Chapter 3. Chapter 4 also describes potential impacts of the offsite manufacturing of components that DOE would use in the repository.

Chapter 5 – Environmental Consequences of Long-Term Repository Performance – describes potential impacts of the Proposed Action described in Chapter 2 on the Yucca Mountain environment described in Chapter 3 after repository closure.

Chapter 6 – Environmental Impacts of Transportation – describes potential impacts of transportation activities nationally and in Nevada, as described in Chapter 2, on the transportation-related affected environment described in Chapter 3.

Chapter 7 – Environmental Impacts of the No-Action Alternative – describes potential impacts of the No-Action Alternative described in Chapter 2.

Chapter 8 – Cumulative Impacts – describes potential impacts of the Proposed Action described in Chapter 2 in combination with the impacts of other past, present, and reasonably foreseeable future actions.

Chapter 9 – Management Actions to Mitigate Potential Adverse Environmental Impacts – describes actions DOE could take to lessen the potential impacts described in Chapters 4, 5, 6, and 8.

Chapter 10 – Unavoidable Adverse Impacts; Short-Term Uses and Long-Term Productivity; and Irreversible and Irretrievable Commitment of Resources – describes impacts that would remain after the application of the mitigation measures described in Chapter 9.

Chapter 11 – Statutory and Other Applicable Requirements – discusses the regulatory and other guidelines for which DOE would be responsible in implementing the Proposed Action.

Chapter 12 – References – **To facilitate ease of use of this Final EIS, DOE has removed this chapter and placed a list of references at the end of each of Chapters 1 through 11. Information regarding the availability of these references can be found in the DOE Reading Rooms (as listed in Appendix D) or on the internet at the Yucca Mountain Project website at <http://www.ymp.gov>.**

Chapter 13 – List of Preparers, Contributors, and Reviewers – lists the persons involved in the preparation of the Final EIS.

Chapter 14 – Glossary – contains definitions of terms used in the Final EIS. Words or phrases defined in the glossary are italicized the first time they are used in the text.

Chapter 15 – Index.

Volume II contains a number of appendixes related to the Proposed Action and the No-Action Alternative, as follows:

Appendix A – Inventory and Characteristics of Spent Nuclear Fuel and High-Level Radioactive Waste and Other Materials – describes the inventory and characteristics of the spent nuclear fuel, high-level radioactive waste, and other highly radioactive material that DOE could dispose of at Yucca Mountain.

Appendix B – *Federal Register* Notices – contains notices published in the *Federal Register* regarding DOE's intent to prepare an EIS, EIS availability, and other matters related to this Proposed Action.

Appendix C – Interagency and Intergovernmental Interactions – describes consultations and other interactions between DOE and other agencies in relation to the Proposed Action.

Appendix D – Distribution List – includes the persons or organizations listed in the EIS distribution database at the time of publication of this Final EIS.

Appendix E – Environmental Considerations for Alternative Design Concepts and Design Features for the Proposed Monitored Geologic Repository at Yucca Mountain, Nevada – discusses features of the repository design as documented in Chapter 2.

Appendix F – Human Health Impacts Primer and Details for Estimating Health Impacts to Workers from Yucca Mountain Repository Operations – provides the basis for the information in Chapters 4 and 8 on human health impacts resulting from the Proposed Action.

Appendix G – Air Quality – provides the basis for the estimates in Chapters 4 and 8 of air quality impacts that would result from the Proposed Action.

Appendix H – Potential Repository Accident Scenarios: Analytical Methods and Results – provides the basis for potential impacts from the accident scenarios analyzed in Chapters 4, 5, 6, and 8.

Appendix I – Environmental Consequences of Long-Term Repository Performance – provides the basis for the potential impacts discussed in Chapter 5.

Appendix J – Transportation – provides the basis for potential impacts related to national and Nevada transportation, as discussed in Chapter 6.

Appendix K – Long-Term Radiological Impact Analysis for the No-Action Alternative – provides the basis for the potential impacts described in Chapter 7.

Appendix L – Floodplain/Wetlands Assessment for the Proposed Yucca Mountain Geologic Repository – describes floodplains near the Yucca Mountain site and along candidate transportation corridors and routes in Nevada.

Appendix M – Transportation Supplemental Information – In response to public comments, this new appendix provides general information not specifically related to the transportation analysis considered in Chapter 6 and Appendix J.

Appendix N – Are Fear and Stigmatization Likely, and How Do They Matter – In response to public comments, this new appendix addresses perceived risk and stigma, as discussed in Section 2.5.4.

Appendix O – Final Biological Opinion for the Effects of Construction, Operation and Monitoring, and Closure of a Geologic Repository at Yucca Mountain, Nye County, Nevada – This new appendix contains the text of the Biological Opinion issued by the U.S. Fish and Wildlife Service.

Volume III, the Comment-Response Document, contains the comments that DOE received on the Draft EIS and on the Supplement to the Draft EIS and the DOE responses to those comments. The Introduction to Volume III describes how DOE solicited comments on the Draft EIS and the Supplement to the Draft EIS, the methodology it used to extract, categorize, and respond to public comments, a summary of the key issues raised in the comments, a discussion on how to use the Comment-Response Document, and index tables that list organizations and individuals who submitted comments. The Introduction also lists the chapters in Volume III, which relate to the following topics:

- Proposed Action
- Nuclear Waste Policy Act
- National Environmental Policy Act
- Other Legal, Regulatory, and Policy Issues
- Alternatives
- Spent Nuclear Fuel and High-Level Radioactive Waste
- Repository Design, Performance, and Affected Environment
- Transportation Modes, Routes, Affected Environment, and Impacts
- No-Action Alternative
- Cumulative Impacts

- Impact Mitigation and Compensation
- DOE Credibility
- Comments Outside the Scope of the Environmental Impact Statement and the Yucca Mountain Site Characterization Project

The chapters in Volume III contain every comment received on a timely basis (see the Introduction to the Comment-Response Document) on each topic, and, in some cases, subtopic. Because a number of comments were similar in nature, DOE summarized them. The chapters also contain the DOE responses to all the comments, either individual or summarized.