

Vol 3 of 3
1545

Nuclear Waste Policy Act
(Section 112)



Environmental Assessment

*Yucca Mountain Site, Nevada Research
and Development Area, Nevada*

Volume III

May 1986

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

Free copies can be obtained from the Department of Energy until supply is exhausted.

Write to:
U.S. Department of Energy
Attention: EA
1000 Independence Ave., S.W.
Washington, D.C. 20585

This report has been reproduced directly from the best available copy.

Additional copies may be purchased from the National Technical Information Service, U.S. Department of Commerce, Springfield, Virginia 22161.

Price: Printed Copy **A99**
Microfiche A01

Codes are used for pricing all publications. The code is determined by the number of pages in the publication. Information pertaining to the pricing codes can be found in the current issues of the following publications, which are generally available in most libraries: *Energy Research Abstracts (ERA)*; *Government Reports Announcements and Index (GRA and I)*; *Scientific and Technical Abstract Reports (STAR)*; and publication, NTIS-PR-360 available from (NTIS) at the above address.

Nuclear Waste Policy Act
(Section 112)



Environmental Assessment

*Yucca Mountain Site, Nevada Research
and Development Area, Nevada*

Volume III

May 1986

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

Appendix C

COMMENT-RESPONSE DOCUMENT

TABLE OF CONTENTS

	<u>Page</u>
C.1 INTRODUCTION	C.1-1
C.1.1 The comment process for the environmental assessments	C.1-1
C.1.2 Classification of comments	C.1-2
C.1.2.1 Policy and programmatic issues	C.1-2
C.1.2.2 Siting process and decisions	C.1-2
C.1.2.3 Data base, proposed activities, repository design	C.1-3
C.1.2.4 Postclosure performance	C.1-3
C.1.2.5 Preclosure radiological safety	C.1-4
C.1.2.6 Environmental, socioeconomic, and transportation	C.1-4
C.1.2.7 Ease and cost of siting, construction, operation, and closure	C.1-5
C.1.2.8 Project-specific miscellaneous	C.1-5
C.2 POLICY ISSUES	C.2-1
C.2.1 Public involvement and institutional issues	C.2-1
C.2.1.1 The DOE's public participation process	C.2-1
C.2.1.1.1 Public review of the draft environmental assessments	C.2-1
C.2.1.1.2 Hearings	C.2-3
C.2.1.1.3 DOE relations with the public	C.2-6
C.2.1.1.4 Access to information	C.2-8
C.2.1.2 Interactions with States, affected Indian Tribes, and local communities	C.2-10
C.2.1.2.1 Interactions with States	C.2-10
C.2.1.2.2 Interactions with affected Indian Tribes	C.2-14
C.2.1.2.3 Working with local communities	C.2-14
C.2.1.2.4 Financial assistance	C.2-15
C.2.1.3 Working with other Federal agencies	C.2-18
C.2.1.4 Working with other countries	C.2-20
C.2.1.5 Socioeconomic impacts	C.2-20
C.2.1.5.1 Socioeconomic impacts and their mitigation	C.2-20
C.2.1.5.2 Land acquisition and property values	C.2-23
C.2.2 Legal and regulatory issues	C.2-25
C.2.3 Program management, costs, and schedules	C.2-28
C.2.3.1 Program management	C.2-28
C.2.3.1.1 Conflicts of interest	C.2-28
C.2.3.1.2 Technical peer review	C.2-29
C.2.3.1.3 Need for program plan	C.2-30
C.2.3.1.4 Protection of the environment	C.2-30
C.2.3.2 Program costs	C.2-30
C.2.3.3 Schedule	C.2-32

TABLE OF CONTENTS (Continued)

	<u>Page</u>
C.2.3.3.1	Dependence of site-selection process on schedule C.2-33
C.2.3.3.2	Effects on the consultation process C.2-33
C.2.3.3.3	Effects on the adequacy of technical data C.2-34
C.2.4	Transportation, retrievability, and second repository . . . C.2-35
C.2.4.1	Transportation C.2-35
C.2.4.1.1	Cost and risk estimates for transportation C.2-36
C.2.4.1.2	Route-specific analysis C.2-37
C.2.4.1.3	Assessment of the consequences of accidents C.2-37
C.2.4.1.4	Maximum exposure of individuals C.2-38
C.2.4.1.5	Modal split for shipments C.2-38
C.2.4.1.6	Defense waste C.2-39
C.2.4.1.7	Monitored retrievable storage C.2-39
C.2.4.1.8	Barge transportation C.2-39
C.2.4.1.9	Consideration of a second repository C.2-40
C.2.4.1.10	The use of existing casks in the EA analysis C.2-41
C.2.4.1.11	Adequacy of current cask designs C.2-41
C.2.4.1.12	Additional testing of casks C.2-41
C.2.4.1.13	Cask weeping C.2-42
C.2.4.1.14	Adequacy of NRC testing requirements C.2-43
C.2.4.1.15	Legal impediments C.2-43
C.2.4.1.16	State designation of alternative routes C.2-44
C.2.4.1.17	Indian rights C.2-44
C.2.4.1.18	Availability of railroads for transporting radioactive waste C.2-44
C.2.4.1.19	Railroad regulations C.2-45
C.2.4.1.20	Dedicated trains C.2-46
C.2.4.1.21	Regional transportation analysis C.2-46
C.2.4.1.22	Weather impacts C.2-46
C.2.4.1.23	Potential for human error C.2-47
C.2.4.1.24	Retrieval of waste C.2-47
C.2.4.1.25	Financing infrastructure improvement C.2-48
C.2.4.1.26	Adequacy of the transportation guideline C.2-48
C.2.4.1.27	Inadequate treatment of transportation issues C.2-49
C.2.4.2	Retrievability C.2-49

TABLE OF CONTENTS (Continued)

	<u>Page</u>
C.2.4.3	Second repository C.2-50
C.2.5	Other waste-management activities C.2-52
C.2.5.1	Monitored retrievable storage C.2-52
C.2.5.2	Onsite storage C.2-53
C.2.5.3	Reprocessing C.2-54
C.2.6	Types of waste to be received at a repository C.2-56
C.2.6.1	Defense waste C.2-57
C.2.6.2	Foreign waste C.2-60
C.2.6.3	Other waste C.2-61
C.2.7	The Draft Environmental Assessments C.2-61
C.2.7.1	EA format and distribution C.2-61
C.2.7.2	Supporting references C.2-67
C.2.7.3	Content of the environmental assessments C.2-69
C.2.7.3	Inconsistencies in the environmental assessments C.2-73
C.2.8	Miscellaneous C.2-79
C.2.8.1	Production of radioactive waste C.2-79
C.2.8.2	Alternatives to geologic disposal C.2-80
C.2.8.3	Generic technical issues C.2-82
C.2.9	References for C.2 C.2-82
C.3	SITING PROCESS AND DECISIONS C.3-1
C.3.1	Siting guidelines and site screening C.3-1
C.3.1.1	The siting guidelines C.3-1
C.3.1.1.1	Development of the guidelines C.3-1
C.3.1.1.2	Time of publication C.3-3
C.3.1.1.3	Adequacy of the siting guidelines C.3-4
C.3.1.1.4	Comments on particular guidelines C.3-7
C.3.1.2	General site-screening issues C.3-8
C.3.1.2.1	Use of ambiguous criteria and lack of uniformity C.3-8
C.3.1.2.2	Importance of host-rock diversity C.3-10
C.3.1.2.3	Selection of sites on the basis of land use C.3-10
C.3.1.2.4	Screening for sites in salt C.3-12
C.3.1.2.5	Particular siting issues C.3-14
C.3.1.2.6	Alternative repository locations C.3-15
C.3.1.3	Site-specific site screening issues C.3-15
C.3.1.3.1	Screening for the Yucca Mountain site C.3-15
C.3.1.3.2	Comparative evaluation of sites C.3-20
C.3.1.3.3	Issues related to the executive summary concerns C.3-23
C.3.2	Evaluation of disqualifying conditions C.3-24
C.3.3	Diversity of geohydrologic settings and the selection of preferred sites C.3-24

TABLE OF CONTENTS (Continued)

	<u>Page</u>
C.3.4 Nomination and recommendation of sites for characterization	C.3-26
C.3.4.1 Comparison of sites on the basis of postclosure guidelines	C.3-27
C.3.4.1.1 System guideline	C.3-27
C.3.4.1.2 Geohydrology	C.3-28
C.3.4.1.3 Geochemistry	C.3-36
C.3.4.1.4 Rock characteristics	C.3-40
C.3.4.1.5 Climatic change	C.3-45
C.3.4.1.6 Erosion	C.3-46
C.3.4.1.7 Dissolution	C.3-48
C.3.4.1.8 Tectonics	C.3-49
C.3.4.1.9 Natural resources	C.3-51
C.3.4.1.10 Site ownership and control	C.3-53
C.3.4.2 Comparison of sites on the basis of preclosure guidelines	C.3-53
C.3.4.2.1 Preclosure radiological safety	C.3-54
C.3.4.2.1.1 Population density and distribution	C.3-54
C.3.4.2.1.2 Site ownership and control	C.3-55
C.3.4.2.1.3 Meteorology	C.3-56
C.3.4.2.1.4 Offsite installations and operations	C.3-58
C.3.4.2.2 Environment, socioeconomics, and transportation	C.3-58
C.3.4.2.2.1 Environmental quality	C.3-58
C.3.4.2.2.2 Socioeconomic impacts	C.3-61
C.3.4.2.2.3 Transportation	C.3-65
C.3.4.2.3 Ease and cost of siting, construction, and closure	C.3-66
C.3.4.2.3.1 Surface characteristics	C.3-67
C.3.4.2.3.2 Rock characteristics	C.3-68
C.3.4.2.3.3 Hydrology	C.3-69
C.3.4.2.3.4 Tectonics	C.3-71
C.3.4.3 Decision method	C.3-72
C.3.4.4 Miscellaneous comments on the nomination and recommendation process	C.3-74
References for Chapter C.3	C.3-80
C.4 DATA BASE, PROPOSED ACTIVITIES, REPOSITORY DESIGN	C.4-1
C.4.1 Baseline conditions at the site	C.4-1
C.4.1.1 Geologic conditions	C.4-2
C.4.1.2 Hydrologic conditions	C.4-9
C.4.1.2.1 Surface water	C.4-9
C.4.1.2.2 Ground water	C.4-10
C.4.1.2.3 Current use	C.4-14
C.4.1.3 Environmental conditions	C.4-16

TABLE OF CONTENTS (Continued)

	<u>Page</u>
C.4.1.3.1 Land use	C.4-16
C.4.1.3.2 Ecosystems	C.4-18
C.4.1.3.3 Air quality and weather	C.4-19
C.4.1.3.4 Noise	C.4-22
C.4.1.3.5 Aesthetic resources	C.4-22
C.4.1.3.6 Archaeological, cultural, and historical resources	C.4-23
C.4.1.3.7 Background radiation	C.4-24
C.4.1.4 Transportation	C.4-25
C.4.1.5 Socioeconomic conditions	C.4-27
C.4.1.5.1 Population density and distribution	C.4-31
C.4.1.5.2 Economic conditions	C.4-31
C.4.1.5.3 Community services	C.4-36
C.4.1.5.4 Social conditions	C.4-43
C.4.1.5.5 Government and fiscal conditions	C.4-49
C.4.2 Activities proposed for site characterization	C.4-50
C.4.2.1 Field studies	C.4-51
C.4.2.2 Exploratory shaft	C.4-52
C.4.2.3 Other activities	C.4-55
C.4.2.4 Alternative activities	C.4-55
C.4.3 The repository	C.4-56
References for Chapter C.4	C.4-69
C.5 POSTCLOSURE RADIOLOGICAL SAFETY	C.5-1
C.5.1 Geohydrology	C.5-1
C.5.2 Geochemistry	C.5-17
C.5.3 Rock characteristics	C.5-28
C.5.4 Climatic changes	C.5-33
C.5.5 Erosion	C.5-38
C.5.6 Dissolution	C.5-39
C.5.7 Tectonics	C.5-41
C.5.8 Human interference (natural resources)	C.5-48
C.5.9 Postclosure site ownership and control	C.5-53
C.5.10 Postclosure system guideline	C.5-54
C.5.11 Assessment of postclosure performance	C.5-58
References for Chapter C.5	C.5-63
C.6 PRECLOSURE RADIOLOGICAL SAFETY	C.6-1
C.6.1 Population density and distribution	C.6-1
C.6.2 Site ownership and control	C.6-3
C.6.3 Meteorology	C.6-4
C.6.4 Offsite installations and operations	C.6-4
C.6.5 System guideline - preclosure radiological safety	C.6-11
C.6.6 Assessment of preclosure performance	C.6-16
References for Chapter C.6	C.6-18

TABLE OF CONTENTS (Continued)

	<u>Page</u>
C.7 ENVIRONMENT, SOCIOECONOMICS, AND TRANSPORTATION	C.7-1
C.7.1 Expected effects of site characterization	C.7-1
C.7.1.1 Effects on the physical environment	C.7-1
C.7.1.2 Effects on socioeconomic conditions	C.7-5
C.7.2 Environmental quality	C.7-10
C.7.2.1 Land use	C.7-15
C.7.2.2 Ecosystems	C.7-16
C.7.2.3 Air quality	C.7-18
C.7.2.4 Aesthetic conditions	C.7-20
C.7.2.5 Noise	C.7-20
C.7.2.6 Archaeological, cultural, and historical resources	C.7-21
C.7.2.7 Background radiation	C.7-22
C.7.3 Expected effects of transportation	C.7-24
C.7.4 Expected effects on socioeconomic conditions	C.7-34
C.7.4.1 Population density and distribution	C.7-45
C.7.4.2 Economic conditions	C.7-48
C.7.4.3 Community services	C.7-56
C.7.4.4 Social conditions	C.7-65
C.7.4.5 Fiscal conditions and government structure	C.7-69
C.7.5 System guideline	C.7-71
References for Chapter C.7	C.7-73
C.8 EASE AND COST OF SITING, CONSTRUCTION, OPERATION, AND CLOSURE	C.8-1
C.8.1 Surface characteristics	C.8-1
C.8.2 Preclosure rock characteristics	C.8-1
C.8.3 Preclosure hydrology	C.8-5
C.8.4 Preclosure tectonics	C.8-7
C.8.5 System guideline	C.8-9
References for Chapter C.8	C.8-10
C.9 COMMENT-RESPONSE INDEX	C.9-1

Appendix C

C.1 INTRODUCTION

This appendix responds to the issues raised by Federal, State, and local governments, affected Indian Tribes, private citizens, and other organizations on the draft environmental assessment (EA) that was prepared pursuant to Section 112 of the Nuclear Waste Policy Act of 1982 (the Act). In addition to presenting the issues raised in the comments and the responses, it describes where changes were made in the final EA.

C.1.1 THE COMMENT PROCESS FOR THE ENVIRONMENTAL ASSESSMENTS

A notice of availability of the draft EA appeared in the Federal Register of December 20, 1984. This notice requested interested parties to review and comment on the draft EA, allowing 90 days for the comment period. The notice also announced an extensive series of public briefings to be held in each of the six States containing potentially acceptable sites for the first repository. These briefings were conducted solely to provide information on the draft EAs, not to solicit comments. Several weeks after the briefings, the DOE held hearings in which the public was invited to submit testimony for the public record.

Comments on the draft EA were in the form of letters addressed to the U.S. Department of Energy and of oral statements presented at 19 public hearings conducted in February and March 1985. Each comment letter or the recorded statement of each hearing participant was given a document-identification number and examined to identify comments. The comments in each letter were numbered sequentially. Copies of the comments and letters can be seen in the public reading rooms at DOE Headquarters and the Project Offices.

Each comment was classified according to subject area and assigned a classification number that corresponds to a section of the Comment Response Document. By referring to the index at the end of this section, each commenter can find the section of the appendix where the issues raised by the comments are addressed.

The subject matter of the comments fell into seven different areas: policy issues; siting process and decisions; data base, proposed activities, and repository design; postclosure performance; preclosure radiological safety; environment, socioeconomics, and transportation; and ease and cost of siting, construction, operation, and closure. The last four groups correspond to the division of technical areas in the general siting guidelines (10 CFR Part 960). Each group is further broken down into more specific topic areas shown in Section C.1.2. Where appropriate, Section C.1.2 shows the section of the EA to which the comment referred.

Within each topic area the the individual comments were screened to determine the specific issues they addressed. Responses were then prepared for each issue. Editorial comments (e.g., spelling and grammatical errors, incorrect cross-referencing, and errors in tables and figures) were considered during the preparation of the final EA, and the appropriate changes were made. Such comments are not specifically discussed in this appendix. Responses to technical issues identify how and to what degree the issue has been incorporated into the final EA. Where possible, the response identifies the places in the final EA where the change was made. For technical comments addressing concerns outside the scope of the document, a statement is made to that effect.

C.1.2 CLASSIFICATION OF COMMENTS

C.1.2.1 Policy and programmatic issues

Section C.2 summarizes and responds to comments that are concerned mainly with policy and programmatic issues. Most of these comments do not address siting decisions or the evaluations reported in the EAs. The exceptions are general comments on transportation, many of which are directed at Appendix A of the draft EAs.

<u>Classification number</u>	<u>Subject</u>
C.2.1	Public involvement and institutional issues
C.2.2	Legal and regulatory issues
C.2.3	Program management, costs, and schedules
C.2.4	Transportation, retrievability, and second repository
C.2.5	Other waste-management activities
C.2.6	Types of waste to be received at a repository
C.2.7	The draft environmental assessments
C.2.8	Miscellaneous

C.1.2.2 Siting process and decisions

Section C.3 addresses questions on the siting process and decisions. Many comments on siting decisions are closely related to technical evaluations of baseline conditions at the sites and of site suitability on the basis of the technical guidelines. Comments that primarily address site-suitability evaluations or supporting information are not included in this section; comments that address the application of suitability evaluations in the rankings of sites are included in this section.

<u>Classification number</u>	<u>Subject</u>	<u>EA section</u>
C.3.1	Site screening and guidelines issues	1.2, 2.2
C.3.2	Evaluation of disqualifying conditions	2.3
C.3.3	Evaluation of the geohydrologic setting	1.3, 2.4
C.3.4	Nomination and recommendation of sites for characterization	7.1, 7.2, 7.3

C.1.2.3 Data base, proposed activities, repository design

Section C.4 addresses comments on the accuracy or adequacy of the baseline information about the repository system, site characterization activities, and the site itself that is used to evaluate site suitability and the impacts of developing the site.

<u>Classification number</u>	<u>Subject</u>	<u>EA section</u>
C.4.1	Baseline conditions at the site	3.2, 3.3
C.4.2	Activities proposed for site characterization	
C.4.3	The repository (including the waste package)	5.1

C.1.2.4 Postclosure performance

Section C.5 includes comments on the condition and performance of the repository after it is closed and sealed.

<u>Classification number</u>	<u>Subject</u>	<u>EA section</u>
C.5.1	Geohydrology	6.3.1.1, 5.2.2
C.5.2	Geochemistry	6.3.1.2, 5.2.1, 3.2
C.5.3	Rock characteristics	6.3.1.3, 5.2.1, 3.2
C.5.4	Climate changes	6.3.1.4, 3.4.3
C.5.5	Erosion	6.3.1.5, 5.2.1, 3.2

<u>Classification number</u>	<u>Subject</u>	<u>EA section</u>
C.5.6	Dissolution	6.3.1.6, 5.2.1, 3.2
C.5.7	Tectonics	6.3.1.7, 5.2.1, 3.2
C.5.8	Human interference (natural resources)	6.3.1.8, 5.2.1, 3.2
C.5.9	Postclosure site ownership and control	6.2.1.1, 3.4.1
C.5.10	Postclosure system guideline	6.3.2
C.5.11	Assessment of postclosure performance	6.4.2

C.1.2.5 Preclosure radiological safety

Section C.6 addresses comments on the behavior and effects of radionuclide releases during repository operations.

<u>Classification number</u>	<u>Subject</u>	<u>EA section</u>
C.6.1	Population density and distribution	6.2.1.2, 5.4.1, 3.6.1
C.6.2	Site ownership and control	6.2.1.3, 3.4.1
C.6.3	Meteorology	6.2.1.4, 3.4.3
C.6.4	Offsite installations and operations	6.2.1.5
C.6.5	System guideline	6.2.2.1
C.6.6	Assessment of preclosure performance	6.4.1

C.1.2.6 Environment, socioeconomics, and transportation

Section C.7 addresses comments on (1) the environmental, socioeconomic, and transportation-related effects of repository development and site characterization; (2) the technical guidelines for socioeconomics, transportation, and the environment; and (3) the use of these guidelines in evaluating the relevant system guideline. Most comments in this category are concerned with the characteristics of the repository before it is closed and decommissioned.

<u>Classification number</u>	<u>Subject</u>	<u>EA section</u>
C.7.1	Expected effects of site characterization	6.3.5
C.7.2	Environmental quality	6.2.1.6
C.7.3	Expected effects of transportation	5.3, 6.2.1.8, 3.5
C.7.4	Expected effects on socioeconomic conditions	6.2.1.7
C.7.5	System guideline	6.2.2.2

C.1.2.7 Ease and cost of siting, construction, operation, and closure

Section C.8 addresses comments about the problems and costs of siting, constructing, operating, and closing the repository.

<u>Classification number</u>	<u>Subject</u>	<u>EA section</u>
C.8.1	Surface characteristics	6.3.3, 3.4.1, 5.1
C.8.2	Rock characteristics	6.3.3, 3.2, 5.1
C.8.3	Preclosure hydrology	6.3.3, 3.3, 5.1
C.8.4	Preclosure tectonics	6.3.3, 3.3; 5.1
C.8.5	System guideline	6.3.4

C.1.2.8 Project-specific miscellaneous

Section C.9 addresses site-specific issues that are not addressed in the technical sections of the document.

C.2 POLICY ISSUES

Many of the comments on the draft EAs were concerned with various policy issues, which are addressed in this section: public involvement and institutional issues (Section C.2.1); compliance with Federal and State laws and regulations, including interpretations of the Nuclear Waste Policy Act (Section C.2.2); program management, costs, and schedules (Section C.2.3); policy issues related to waste management, such as transportation, retrievability, monitored retrievable storage, and spent-fuel reprocessing (Sections C.2.4 and C.2.5); and the types of waste to be received at the repository (Section C.2.6). Also included in this section are direct comments on the draft EAs (Section C.2.7) and miscellaneous issues (Section C.2.8).

C.2.1 PUBLIC INVOLVEMENT AND INSTITUTIONAL ISSUES

This section addresses comments on public involvement and institutional issues. These issues are divided into five categories: conduct of the public-participation process; interactions with States, affected Indian Tribes, and local communities; working with Federal agencies; working with other countries; and socioeconomic impacts.

C.2.1.1 The DOE's public participation process

Comments on the DOE's public-participation process were concerned mainly with reviews of, and hearings on, the draft EAs. Other issues in this category were related to the DOE's relations with the public and access to information.

C.2.1.1.1 Public review of the draft environmental assessments

Many commenters said that the 90-day comment period for the draft EAs was not long enough for a thorough review. Others complained about delays or difficulties in receiving copies of the draft EAs and suggested that the documents should have been available in public libraries.

Issue

Many commenters said that the 90-day public comment period did not permit a thorough review of the lengthy and technical draft EAs, especially since the beginning of the comment period coincided with the year-end holidays.

Response

The DOE issued the draft EAs for public comment in the interest of expanding public participation in the site-selection process. The issuance of draft EAs was not required by the Act, and it entailed significant penalties in schedule. The DOE decided to accept these penalties because it deemed this

opportunity for public involvement to be important. Furthermore, in response to public comments on the draft Mission Plan (DOE, 1984a) the DOE extended the planned EA comment period from 60 to 90 days. One of the purposes of this extension was to compensate for potential delays in the mailing and distribution of the documents during the holiday season.

To help the public understand the draft EAs, the DOE conducted a series of interactive briefings in January 1985 and 19 public hearings in February and March 1985 in the six States containing the sites and in an adjacent State.

In revising the EAs, a special effort was made to consider comments received after the March 20, 1985, deadline. The final EAs reflect comments received as late as August 30, 1985.

Issue

DOE representatives allegedly had promised that the comment period would be extended, but it was not.

Response

The DOE did not officially extend the public-comment period. However, as explained above, the DOE made every effort to consider comments received after the deadline, and, as mentioned above, the final EAs reflect comments received up to 5 months after the deadline.

Issue

Because the 90-day comment period began before his term, the new Governor of Utah had less opportunity for involvement.

Response

The State of Utah submitted supplementary comments. These comments were received on May 1, 1985, and were considered in revising the EAs.

Issue

Some persons said they had experienced difficulty in obtaining copies of the draft EAs or felt that the DOE's response to requests for copies was very slow.

Response

To facilitate requests for the draft EAs, the DOE set up toll-free telephone numbers for use by the general public during the 90-day comment period. Despite some initial difficulties, the toll-free system worked well as a means for requesting the EAs. However, the DOE recognizes with regret that some persons may have experienced delays in receiving the EAs. The demand for the EAs was great, and over 5,000 copies were distributed.

Issue

Some commenters said that documents like the EAs should be available in libraries to facilitate timely review. One party complained that access to the reference documents for the EAs was very poor in the local libraries.

Response

Copies of the draft EAs were placed in the public libraries of local communities closest to the potentially acceptable sites. In addition, copies were available in DOE public reading rooms, which are open during normal business hours and have copies of all available program-related materials, including most of the reference documents cited in the EAs. Moreover, the draft EAs and the reference documents were available in the DOE public information offices in communities near all the potentially acceptable sites.

Issue

One commenter recommended that in soliciting comments the DOE should give a name to whom to write, rather than "comments."

Response

In the Federal Register notice that announced the availability of the draft EAs, interested parties were requested to send comments to "Comments—EA," which was a special mail stop set up to receive comments letters. The names of several DOE officials were also given for further information on specific draft EAs. The intent was to facilitate the comment-response process by not overloading any single individual or mail stop.

C.2.1.1.2 Hearings

Several commenters complained about the public hearings on the draft EAs; they said that the DOE had not adequately notified the public about the hearings and that the hearings were scheduled at inconvenient times and locations. Others said that there were problems with the conduct of the hearings themselves: that unreasonable limits were placed on the scope of the subject matter and on the time allotted each speaker; that the hearings became an exchange of misinformation; and that panel members did not adequately represent the views of the community.

Issue

Some comments alleged that the public was not adequately notified about the hearings.

Response

Notices about the public hearings were published in the Federal Register. In order to reach the general public that does not have ready access to the Federal Register, the DOE also issued press releases from the DOE offices in Washington, D.C., as well as the DOE Project Offices

responsible for investigating the three types of host rock (basalt, salt, and tuff). In addition, the Project Offices mailed copies of the Federal Register notice of the availability of the draft EAs and the announcements of the public briefings and hearings to more than 4,000 persons and organizations that had in the past commented on, or inquired about, various aspects of the DOE's geologic-repository program. The DOE Office of Consumer Affairs made a similar mailing to approximately 200 consumer and public-interest groups, and the DOE Office for Congressional, Intergovernmental and Public Affairs notified the offices of U.S. Senators and Representatives. In addition, news releases were issued, paid advertisements were run in many local newspapers, and notices were posted in the public buildings of the local communities. In January 1985, the DOE held interactive briefings for State officials and for the public to provide information on the EAs and the public-comment process; the dates and locations of the hearings were publicized during these briefings.

Issue

Some persons objected that the schedules and the locations of the public hearings were inconvenient.

Response

The hearings were scheduled to begin more than 6 weeks after the draft EAs were issued on December 20, 1984, and several weeks after the briefings held to provide information about the EAs. This schedule allowed several weeks for preparing comments before the hearings and also time for preparing written comments after the hearings. The written comments were accorded the same importance as the oral testimony.

During February and March 1985, 19 public hearings were held in the six States containing the sites under consideration and in 1 adjacent State. The hearings were scheduled for both day and evening hours to accommodate as many people as possible. They were held in major cities that are readily served by all modes of transportation as well as in the local communities closest to, and most likely to be affected by, a repository at a particular site.

Issue

Commenters said that unreasonable limitations were placed on the scope and the procedures of the hearings, undue time limitations were placed on speakers, and the ground rules of the hearings were changed at the last minute.

Response

Although the DOE had hoped that the public would address the draft EAs in its comments, no attempt was made to limit the scope of the hearings.

In the notices of the public hearings, the DOE requested all people who wished to testify to register in advance. The agendas of the hearings were based on this preregistration. However, the DOE made it clear at each hearing that every person wishing to speak would have an opportunity. This was

accomplished by adjusting the time allotted each speaker, by extending the length of a session where necessary, and by holding an additional hearing in the State of Washington.

Hearing procedures were discussed at the public briefings that preceded the hearings, explained during registration, and again explained at the beginning of each session. They included time limits, which were necessary to give all interested parties a chance to speak. However, it was made clear at each hearing that, to accommodate all speakers, the session would be extended or additional hearings would be held. In addition, the public was reminded that written comments were welcome and could be submitted after the hearings, through March 20, 1985.

Issue

According to some commenters, public hearings should be forums for the DOE to educate the public rather than public exchanges of misinformation.

Response

The purpose of the hearings was to give the public an opportunity to be heard. The DOE uses other forums to supply information; an example is the series of briefings held during January 1985 to explain the draft EAs and the siting process and to answer questions. The hearing is the citizens' forum for educating the DOE about their needs, concerns, perceptions, and ideas. The DOE did not present information, nor did it discuss, except to clarify, the comments received at the hearings.

Issue

Some parties felt that "community representatives" on the hearing panels did not always accurately reflect the views of the community; in some cases, the presence of a particular individual could have been considered a conflict of interest.

Response

The role of the panelists was to clarify the testimony for the record, not to represent the community. Although the non-DOE panelists were selected by the DOE, they were not selected to represent any specific viewpoint.

Issue

Some commenters suggested that the DOE should open each public hearing to testimony on all of the sites rather than one specific site. This would help the public to compare the sites.

Response

None of the public hearings was restricted to the discussion of a particular site. Chapter 7, which presents a comparative evaluation of the sites against the siting guidelines, is common to all of the EAs, and to provide the reader with a basis for the comparison, the draft EAs for all nine sites were available as a package.

C.2.1.1.3 DOE relations with the public

Comments on the DOE's relations with the public covered a variety of topics, ranging from recommendations for a public referendum on waste disposal to complaints about the DOE's attitude toward the public. They also included requests for an early announcement of the sites to be recommended for characterization.

Issue

Some commenters suggested that there should be a public referendum on the issue of radioactive-waste disposal.

Response

The American political process provides citizens with several opportunities to make their views known at the local, State, and Federal levels. In 1982, the U.S. Congress, the elected representatives of the American people, found that "high-level radioactive waste and spent nuclear fuel have become major subjects of public concern, and appropriate precautions must be taken to ensure that such waste and spent fuel do not adversely affect the public health and safety and the environment for this or further generations" (Section 111(a)(7) of the Act) and therefore enacted the Nuclear Waste Policy Act of 1982. The Act stipulates the technical and public process that the DOE has been following since January 1983.

Issue

A commenter requested that the EA emphasize the "development of appropriate mechanisms to achieve public consensus" mentioned in a report.

Response

The progress report referred to a series of socioeconomic studies that will be undertaken throughout the repository-siting program. The development of public consensus is one of the objectives for the socioeconomic portion of the siting program.

Issue

Some commenters felt that the DOE has a negative attitude toward the public. Several people said that the public-involvement process was carried out solely for the sake of appearance, public comments were not taken seriously, and local sentiments will not really be considered in making the final decision.

Response

The comments of the public have been, and will continue to be, seriously considered in the decisionmaking process. The comments of the public were considered in revising the siting guidelines, and issues raised in the EA scoping hearings were considered in preparing the draft EAs. Substantive comments on the draft EAs have been considered in producing this appendix and the final EAs. Furthermore, the DOE believes that local citizens have

legitimate and vital interests in the repository program and has sought to learn their attitudes and concerns through meetings and workshops. Any appearance that the DOE has a negative attitude toward local citizens is unintended and clearly not in the interests of the DOE.

Issue

The DOE was accused of not being honest with the public, both in the context of the general program and on specific issues. For example, some persons felt that the presence of a drill rig at the Hanford site suggests that the DOE is already committed to that site.

Response

The perception of dishonesty may stem from two sources: ongoing changes in policy direction and inadequate information. Changes in policy direction are the by-product of a process that involves many people on all levels of government and the private sector. They result from changing circumstances, long time spans, improving data, and program growth and development. Although the unfortunate result may be the appearance of a coverup of facts as policy direction changes, the only alternative is an unacceptable rigidity.

To improve the problem of inadequate information, the DOE is committed to provide a full and timely flow of information about program activities to all affected parties and to provide frequent opportunities, both formal and informal, for the fullest possible participation in program activities. Accomplishing this depends on developing and maintaining information and interaction programs that meet the needs and address the concerns of States and Indian Tribes, local governments, affected citizens, the general public, and other interested parties. Detailed plans for achieving these goals are discussed in Part I of Volume I of the Mission Plan (DOE, 1985a).

Contractual arrangements for a drill rig at the Hanford site were made before the passage of the Act, but the rig has not been used at the site since the Act was passed and will be used only if Hanford is one of the sites recommended and approved for site characterization. The DOE is not committed to the Hanford site or any other site.

Issue

Commenters said that the public has not been fully informed about the site-selection process, particularly for the Deaf Smith and the Swisher sites in Texas.

Response

The potentially acceptable sites in Swisher and Deaf Smith Counties, Texas, were identified in the report Identification of Preferred Sites Within the Palo Duro Basin (DOE, 1984b) which was issued in draft form for comment in March 1984. The final report was released in November 1984. The boundaries of the sites in the final report were revised on the basis of comments on the draft report by the State of Texas and other parties. Both the draft and the

final reports were broadly distributed and made available in local libraries and information offices. Further, after the draft reports, the DOE held briefings to explain the site-selection process.

Issue

Some persons felt that a general mitigation policy of indemnifying local citizens against the burden of uncertainties should be developed.

Response

The DOE cannot eliminate uncertainty. However, it is taking steps to inform local citizens about its activities and to involve both State and local representatives in the siting process.

Issue

A number of commenters requested early announcement of the sites to be recommended for characterization. They said that the DOE should remove as soon as possible the worry of repository siting from the areas not being recommended.

Response

The DOE is acutely aware of the apprehension that citizens of the States with potentially acceptable sites are experiencing. However, the announcements of the sites nominated and recommended for characterization had to await the completion of the final comparative evaluation of the sites and the publication of the final EAs, the multiattribute utility analysis of the nominated sites, and the recommendation by the Secretary of Energy of candidate sites.

C.2.1.1.4 Access to information

Many parties felt that opposition to the waste-management program results from misinformation about, and exaggeration of, the possible adverse effects associated with a geologic repository. They suggested that an improved program of public information and education would increase understanding and thereby the acceptance of the program. Several commenters recommended improved information programs because informed consent by the public depends on the availability of accurate, intelligible information. Others offered specific recommendations or complaints.

Issue

The DOE should establish a major information program, including (1) a constant flow of information that is timely, accurate, and easily understood and (2) more-frequent hearings and information sessions.

Response

Recognizing that public information is crucial to the success of the repository program, the DOE is committed to a thorough program of public participation. Its plans for public information and outreach are described in Chapter 4 of Part I of Volume I of the Mission Plan (DOE, 1985a). Valuable contributions to the development of these plans have come from States, affected Indian Tribes, and the public. The DOE will continue to seek information from interested parties on developing ways to identify public concerns, to provide information that addresses these concerns, and to involve the public in the decision process.

Issue

Some commenters alleged that the DOE will disclose information only under a formal request under the Freedom of Information Act.

Response

The DOE routinely shares program information with all of the affected parties and public and has specifically established information offices for that purpose. Information is disseminated through responses to letters, news releases, public announcements, and technical reports. Other vehicles for sharing information are exhibits, briefings, workshops, and meetings. In some cases, States and citizens have used the Freedom of Information Act as a means to obtain specific data or copies of letters.

Issue

Some persons felt that the DOE's ability to supply information to the public will be limited by the acceptance of defense waste in the repository.

Response

The acceptance of defense waste for disposal (see Section C.2.6.1) will not affect access to information or opportunities for public comment. Information on the quantities, characteristics, and environmental impacts of the defense waste is not classified.

Issues

Persons gathering information about the sites allegedly did not identify themselves as DOE employees or contractors.

Response

The DOE's policy is for its employees and contractors to clearly identify themselves when requesting information. The DOE or its contractors have not deliberately misrepresented the objectives of gathering information and would appreciate being informed directly of the specific dates and events when such misrepresentations were made.

C.2.1.2 Interactions with States, affected Indian Tribes, and local communities

C.2.1.2.1 Interactions with States

A number of commenters said that the DOE needs to set up better mechanisms for working with States and notifying them about the program. Others asked how the DOE intends to comply with existing State regulations. In addition, the DOE was asked to give Oregon affected-State status.

Issue

Commenters said that the DOE needs to develop better mechanisms for working with States, rather than simply assuming that States will agree to the DOE's suggestions.

Response

As explained in Chapter 4 of Part I in Volume I of the Mission Plan (DOE, 1985a), the establishment of mechanisms for working with States is an important objective of the DOE's institutional program. The DOE has worked closely with the representatives of every State that has a potentially acceptable site for the first repository. Furthermore, informal meetings with first-repository States and discussions with the second-repository States have been initiated. These meetings are intended to give the States additional opportunities to express their concerns and to participate in the development of the repository program. The DOE will continue to attempt to secure smooth working relationships.

Issue

Some States contended that they have not been notified in sufficient time, are not consulted, and their requests for information are not acknowledged or satisfied.

Response

Since the identification of the States with potentially acceptable sites for the first repository, the DOE has tried to consult with them on various siting issues. An example is the extensive consultation process on the siting guidelines, which involved both meetings with individual states and plenary sessions with the first- and second-repository States as well as the submittal of several drafts of the guidelines for State review. This process is described in the "Supplementary Information" for the DOE's siting guidelines (DOE, 1984c).

Although the DOE has made a concerted effort to provide full information to the States, it recognizes that information has not always been provided promptly. The DOE is trying to improve its capability to provide timely responses and is developing program data bases specifically for that purpose. If the States so desire, procedures for providing information may be specified in consultation-and-cooperation agreements.

Consultation and cooperation between the DOE and States is a dynamic process; it will not be limited to activities specified in the consultation-and-cooperation agreements. Further information about the consultation-and-cooperation process can be found in Chapter 4 of Part I of Volume I and in Chapter 3 of Part II in Volume I of the Mission Plan (DOE, 1985a).

Issue

One party recommended that the DOE conclude consultation-and-cooperation agreements with States to provide a formal structure for information and comment.

Response

To ensure that States are actively involved in the program, a formal consultation-and-cooperation process will be established through the written agreements provided for in Section 117(c) of the Act. High priority has been placed on concluding these agreements promptly. No formal consultation-and-cooperation agreements have yet been signed with any State, although negotiations have been initiated with the State of Washington.

In the absence of a consultation-and-cooperation agreement, the DOE will continue to provide both information and opportunities for comment.

Issue

Some commenters felt that the States should have been part of the EA process from the beginning and that the EAs could have benefitted from their involvement.

Response

The States with potentially acceptable sites were asked to participate very early in the EA process, starting with the scoping hearings held early in 1983. Subsequently, the DOE shared various drafts of the EAs with these States. The EAs did indeed benefit from the careful reviews performed by the States, and the DOE is grateful for their thoughtful comments.

Issue

Some States expressed concerns about the DOE's plans for compliance with State regulations in the siting process.

Response

The DOE intends to comply with the substance of any applicable State and local regulations that are consistent with its responsibilities under the Act.

The applicable regulations will be identified in consultation with the affected States and local governments. One of the objectives of the consultation process (see Section C.2.1.2) will be to identify which State or local regulations are applicable to a particular siting, construction, or operation activity and are consistent with the DOE's responsibilities under

the Act (i.e., do not include onerous reporting requirements or entail unacceptable delays). Another objective will be to agree on the mode or the extent of compliance. For the repository program, this consultation process is to begin immediately after the Presidential approval of the three sites recommended for characterization.

Issue

Several States oppose the siting of a repository within their borders.

Response

The Act outlines the process to be followed in the event that the Governor or the legislature of the State opposes the selection of a site in its borders for development as a geologic repository. The Act encourages the DOE to work closely with States in advance of recommendation and to develop a technical program that is credible to the State. However, the Act also provides the opportunity for the State to issue a notice of disapproval, with explanation, at the time that a site in that State is recommended for a repository (Section 116(b)(2)). Such disapproval can be overridden only by a joint resolution of Congress.

Issue

Some States felt that they should have the right to comment or concur on the DOE's plans without losing their rights to issue a notice of disapproval.

Response

The Act empowers a State with a site selected for a repository to submit a notice of disapproval to Congress. This right is not affected by previous comments on the site-selection process. Indeed, States are encouraged to submit comments throughout the process and to provide suggestions to improve the technical quality of the program.

Issue

Some comments urged that States be given the authority to monitor and review activities at every step of the process.

Response

The DOE has been encouraging States to participate in the siting process for more than 5 years through regular interactions with designated representatives. Consultation-and-cooperation agreements will allow each State and affected Indian Tribe to identify and describe in more detail the rights and responsibilities of the parties to each agreement. The agreements can include provisions for States to monitor and review program activities.

Issue

The State of Louisiana expects the DOE to honor the memorandum of understanding that grants the State veto power over any DOE plans for a repository. The agreement was signed February 27, 1978.

Response

The DOE has always maintained the position that the memorandum of understanding between the DOE and the State of Louisiana is valid consistent with the provisions of applicable law. However, if Vacherie Dome in Louisiana were clearly the best site, the DOE, being committed to implementing the Act, would recommend the site to Congress for development as a repository. At that time, Louisiana, like any other State, would have the opportunity to issue a notice of disapproval. The memorandum of understanding was signed before the enactment of the Act, which gave States the opportunity to veto the selection of a site within their borders; the Act supersedes prior agreements.

Issue

One commenter pointed out that a request by the Washington State legislature that granite be considered for the first repository was ignored by the DOE.

Response

The Act required the DOE to identify the potentially acceptable sites for the first repository within 180 days after the Act was passed. Studies of granite had not progressed to the point where the DOE could identify potentially acceptable sites in granite for the first repository. Granite is, however, being considered for the second repository.

Issue

The DOE was asked how it would respond to such State initiatives as Mississippi's statement that it is the policy of the State that radioactive waste may not be stored in Mississippi or the Oregon measure, passed by a ballot, requiring that there be no postclosure releases of radioactive material. Similarly, several comments from communities in Nevada said that their governing bodies had passed resolutions voicing opposition to waste transportation through these communities and to the siting of a repository in Nevada.

Response

The DOE intends to comply with all State regulations consistent with its responsibilities under the Act. However, in some instances State or local legislation that attempts to directly regulate the repository program may not be permissible under the U.S. Constitution.

Issue

According to some comments, Oregon should be recognized as an affected State and be accorded the rights and privileges of an affected State because of its proximity to the Hanford site and to the potentially affected Columbia River.

Response

Because none of the potentially acceptable sites is located within its borders, Oregon is not eligible under the Act for the rights and privileges of an affected State. Nonetheless, Oregon has participated actively in the site-selection process. It has appointed both a Hanford repository review committee composed of State officials and a citizens advisory committee to provide review from a public perspective. Recognizing the high level of interest among local citizens, the DOE held a public hearing on the EAs in Portland on March 11, 1985, and will continue to seek comment from the State of Oregon.

C.2.1.2.2 Interactions with affected Indian Tribes

Issue

Some commenters said that the DOE had not considered the religious attitudes of the Indians toward their land and the effects of site characterization on Indian lands. The Western Shoshone Indian Nation requested that it be declared an affected Tribe and that its tribal council be consulted before the start of any site-characterization activities at the Yucca Mountain site in Nevada.

Response

The DOE recognizes the importance of Indian religious and cultural resources and has specifically included proximity to significant Indian resources, such as major religious sites, as a potentially adverse condition in the siting guidelines.

The Western Shoshone Indian Nation requested affected-Tribe status because it claimed ownership of the land on which the Yucca Mountain site is located. The Federal Government's position that the Shoshone Tribe does not own the land was upheld by the Supreme Court (United States vs. Mary Dann and Carrie Dann, 105 U.S. Supreme Court 1058, February 20, 1985). The Tribe will be able to interact with the DOE through the public comment and interaction process.

C.2.1.2.3 Working with local communities

Issue

Several comments suggested that local communities should have more input and involvement in the siting process and in the development of the waste-management program.

Response

The DOE plans to continue working with both State and local governments during the siting process. The DOE intends to continue holding public meetings and outreach programs for local leaders and the general public in the

vicinity of potential sites and to keep State officials informed of such activities. Although not required by the Act, procedures for local-government representation could be included in consultation-and-cooperation agreements.

The DOE plans to encourage the participation of local community representatives in assessing the potential socioeconomic impacts of a repository, in developing plans to avoid or mitigate significant adverse impacts, and in preparing the impact-identification report that the State is to submit with its request for mitigation assistance. States will be encouraged to provide for and support such local participation.

The DOE is developing policies for providing financial assistance to support local participation in the program either through the State or, if necessary, by direct means. If the State government has established mechanisms for direct local participation and financial support for local efforts, the DOE will provide adequate funding to the State agency responsible for implementing local participation. Where the State government does not provide for direct local participation and support, the DOE will work directly with local representatives to assess potential impacts and may provide direct funding to units of local government.

The DOE meets frequently with local officials and other interested parties for exchanges of views and information.

DOE information offices in communities near the sites under consideration are walk-in sources of information. They provide answers to questions and educational materials. These offices also serve as libraries for public documents and short films, as well as places for the public to submit comments and questions about the program. (See Appendix B for the locations of these offices.)

Issue

Most people in Beatty, Nevada, want Yucca Mountain to be the selected site because of the economic benefits to the area, but the Governor responded negatively, overriding the desires of the citizens closest to the potential site.

Response

The DOE is aware that the interests of local citizens and the State may conflict, but will not intervene in intrastate political or economic disputes. Nonetheless, the DOE welcomes the input of local citizens in the waste-management program and will seek their participation through provisions in consultation-and-cooperation agreements with the States and through the socioeconomic impact assessments that will be conducted concurrently with site characterization.

C.2.1.2.4 Financial assistance

Several States and localities requested information about the distribution and availability of financial assistance. Some States complained that the grants they received for EA review were late; others requested funds to conduct independent technical studies. Several comments were concerned with grants to local communities or private organizations.

Issue

The DOE should provide information about the purpose, timing, and distribution of grants.

Response

The Act authorizes the DOE to provide financial assistance to States and affected Indian Tribes for (1) participation in the repository program and for facilitating effective public participation (2) participation in the consultation-and-cooperation process (see also Section C.2.1.2.1); and (3) the mitigation of socioeconomic impacts. To date, all six States considered for the first repository and three affected Indian Tribes have been awarded grants for participation in the program. In fiscal years 1983 and 1984 a total of \$2,157,301 and \$4,590,356, respectively, was awarded. Grants also have been extended to the 17 States being considered for the second repository to enable them to participate in site screening. In fiscal years 1983 and 1984, these awards totaled \$930,376 and \$2,942,186, respectively. Grants allow States and affected Indian Tribes to review and comment on documents, like the technical reports, the siting guidelines, the draft EA, and the Mission Plan and to participate in program meetings and workshops.

The nature and level of grants for the mitigation of socioeconomic impacts will be largely based on the socioeconomic-impact reports that States or affected Indian Tribes will submit and on discussions and negotiations between the DOE and States, affected Indian Tribes, and communities. Both financial and technical support will be provided for the development of such reports. This support can assist States and affected Indian Tribes in examining the public health and safety, environmental, social, and economic impacts of a repository. Also provided for the mitigation of fiscal impacts will be grants equal to the taxes that would be collected if the repository were a commercial project. (See Section C.2.1.5.1 for comments and responses on the mitigation of socioeconomic impacts.)

The DOE will work with States, affected Indian Tribes, and localities to develop impact-mitigation plans in response to the siting of a repository. These plans will address ways to augment community services as well as ways to minimize socioeconomic disruptions and maximize the benefits of new economic activity related to program activities.

Issue

Some State grants for the review of the draft EA were allegedly late, and they were smaller than requested.

Response

All requests for financial assistance from States or affected Indian Tribes are reviewed for conformance to the DOE guidelines on financial assistance. These guidelines ensure compliance with the requirements of the Act as well as consistency and equity among States and Indian Tribes. Once the DOE has reviewed the request, negotiations with the State can begin. Sometimes these negotiations can be lengthy. Delays have occurred when a request lacked key information or when States requested funds for activities outside the scope of the Act or the DOE financial assistance guidelines.

The amount of a grant is decided case by case, but each request is evaluated against similar requests from other States and Indian Tribes. Once the DOE obtains all the information necessary and discusses it with the State, adequate funding levels are determined and awarded. Interim funding is often extended if a grant is delayed.

Issue

Several States asked for funds to conduct independent technical assessments, both for developing new information and for checking the DOE's analyses. Some States alleged that requests of this type were turned down by the DOE.

Response

The Act requires the DOE to provide financial assistance to States or affected Indian Tribes "to engage in monitoring, testing, or evaluation activities with respect to site characterization programs with respect to such site." The DOE's guidelines on financial assistance also extend this funding to phase II (i.e., States and Tribes that have potentially acceptable sites, but have not yet been notified of their status as candidate sites). The DOE had interpreted the Act to mean that activities thus funded should focus on independent monitoring, testing, and evaluation of DOE data.

On December 2, 1985, the Court of Appeals for the Ninth Circuit ruled that the DOE is required under the Act to fund States and Indian Tribes to conduct pre-site characterization studies involving primary data collection if such studies "would be essential to an informed statement of reasons explaining why [the State/Indian Tribe, if on tribal land] disapproved the recommended repository sites" and if the ability of the studies to contribute to the statement of reason "depends on their being initiated prior to site characterization" (State of Nevada vs. Herrington, (No. 84-7846). The DOE is revising its financial assistance guideline in accordance with this ruling.

Issue

Local communities want to share in the grants available under the Act.

Response

Financial assistance to local governments is addressed in Section 4.12 of Part I, Volume I, of the Mission Plan (DOE, 1985a):

The DOE will continue to provide grants and other financial assistance, as appropriate, to States, affected Indian Tribes, and others to facilitate effective public participation in the program. In addition, the DOE will seek ways to encourage the involvement of other interested parties through grants and other technical or financial assistance.... The DOE will also seek ways to facilitate effective participation by units of general local government that may be affected by program activities.

As already mentioned, the DOE is developing policies for providing financial assistance to support local participation in the program. If the State government has established mechanisms for direct local participation and financial support for local efforts, the DOE will provide adequate funding to the State agency responsible for implementing local participation. Where the State government does not provide for direct local participation and support, the DOE will work directly with local representatives.

Issue

One party said that requests by a private organization for funds to develop balanced information have been denied by the DOE.

Response

The DOE provides financial assistance to national and regional organizations that represent an extension of State and Tribal interests to facilitate their participation in the waste-management program. The organizations that have received such grants are the National Congress of American Indians, the National Conference of State Legislatures, the Western Interstate Energy Board, and the Southern States Energy Board. Where such organizations are likely to improve coordination or the involvement of affected parties, future funding will be provided.

C.2.1.3 Working with other Federal agencies

A number of commenters addressed the participation of other Federal agencies in the repository program. Most of them were interested in the roles of the Nuclear Regulatory Commission and the Department of Defense. (See also Section C.2.2 for comments and responses about the regulations of Federal agencies.)

Issue

A commenter alleged that too many Federal agencies are involved in the siting process. Another suggested that it is vital that agencies whose primary concern is public safety be involved in developing the repository.

Response

The management of spent fuel and high-level waste requires the participation of many agencies of the Federal Government because of their regulatory responsibilities. The Act assigns lead responsibility to the DOE, but significant roles are expected for the following other agencies:

- The Nuclear Regulatory Commission.
- The Environmental Protection Agency.
- The Department of Transportation.
- The Bureau of Indian Affairs.
- The Bureau of Land Management.

- The U.S. Geological Survey.
- The U.S. Army Corps of Engineers.
- The Advisory Council on Historic Preservation.

More-detailed information about the roles of these agencies can be found in the DOE's Project Decision Schedule (DOE, 1985b).

Issue

Information about the involvement and responsibilities of the Nuclear Regulatory Commission and the Department of Defense was requested by several commenters.

Response

The DOE must obtain from the Nuclear Regulatory Commission (NRC) concurrence on the siting guidelines, a license to construct the repository, a license to receive and possess the waste at the site (i.e. to operate the repository), and subsequent license amendments for the closure and decommissioning of the repository. The NRC also will issue site-characterization analyses based on the DOE's site-characterization plan for each site approved for characterization. The NRC licensing process is based on the procedures and the technical criteria issued as 10 CFR Part 60 (NRC, 1983). The objective is to implement the standards set by the Environmental Protection Agency for waste isolation in geologic repositories and thus provide reasonable assurance that geologic repositories will isolate the waste for at least 10,000 years without posing undue risk to public health and safety. Since 10 CFR Part 60 was issued before the Act was passed, the NRC is revising it for compliance with the Act; 10 CFR Part 60 may also change in response to the Environmental Protection Agency's final environmental standard (40 CFR Part 191), which was published on September 19, 1985 (EPA, 1985).

The Department of Defense is involved in the program through the U.S. Army Corps of Engineers, which is advising the DOE on the acquisition of private lands.

Issue

One party stated that the DOE should complete consultation with the U.S. Fish and Wildlife Service on threatened and endangered species before proceeding with site recommendation for characterization.

Response

The DOE has been communicating with the U.S. Fish and Wildlife Service on designated critical habitats and the possibility of threatened or endangered species occurring at any of the sites. In response to specific concerns about the presence of protected species at the Davis Canyon site, the DOE participated with interested agencies and individual experts in a field survey conducted in July 1985. When a site has been selected for repository development, the DOE will enter into a formal consultation with the Service. Until then, the DOE will remain in contact with the Service and with State agencies regarding protected species.

C.2.1.4 Working with other countries

Issue

Because the disposal of radioactive waste is an international problem, the DOE should seek technical assistance and independent scientific analyses from other nations that do not have a vested interest.

Response

It has long been U.S. policy to cooperate with other nations in developing waste-management technology. As described in the Mission Plan (DOE, 1985a, Volume I, Part I, Chapter 5), the DOE actively participates in international cooperation and information exchange through bilateral agreements, multinational activities, and international forums and programs. These activities are part of the DOE's overall program under current agreements with Belgium, Canada, France, the Federal Republic of Germany, Japan, Sweden, Switzerland, the United Kingdom, the Commission of European Communities, the International Atomic Energy Agency, and the Nuclear Energy Agency (NEA) of the Organization for Economic Cooperation and Development. The DOE is currently most active in joint projects with Canada, Germany, Sweden, and the NEA. These projects include (1) an underground crystalline-rock research laboratory in Canada; (2) ongoing tests in the Asse salt mine in Germany; and (3) tests in the Stripa mine in Sweden, which are being performed in crystalline rock.

C.2.1.5 Socioeconomic impacts

This section covers two topics that drew many comments: (1) socioeconomic impacts and their mitigation and (2) the acquisition of laws and effects on property values.

C.2.1.5.1 Socioeconomic impacts and their mitigation

Many comments, from the States, local communities, and the public, addressed various issues related to the socioeconomic impacts of a repository and their mitigation. Some of them alleged that the DOE had not adequately involved local communities in assessing the effects and did not understand local values. Others were concerned about the timing and adequacy of mitigation grants.

Issue

Some comments said that the DOE has not adequately involved the citizens of local communities in evaluating the effects of a repository on local people, businesses, and services.

Response

The DOE will conduct socioeconomic studies that will involve local communities and will collect information from local sources (schools, local officials, etc.). These studies will be conducted concurrently with site characterization and will be much more detailed than the preliminary assessments included in the EAs.

Some socioeconomic impacts, such as increased demands for public services, will affect local governments directly. For this reason, the DOE will encourage the participation of local governments in the preparation of the socioeconomic-impact reports as early and as fully as possible. The DOE will encourage the States to allocate a portion of their grant to affected localities.

Issue

The DOE allegedly does not understand and appreciate the values of the local communities at the sites that are being considered.

Response

After the President approves the sites recommended for characterization, the DOE will begin detailed studies of the demographic and social and economic conditions in local communities, collecting information from local sources. These studies will examine the effects of the repository on the local economy, community services, housing, and the like. Transportation-related effects on local communities will also be analyzed. Local communities will continue to have opportunities to be directly involved in the assessment of socioeconomic effects, and their officials will be asked to provide information not only about local economic and social conditions but also about the attitudes of the community.

Issue

The EAs should include more information in Chapter 5 about the financial impacts of site characterization and repository development on local communities and the grant programs applicable to individual sites.

Response

Chapter 5 of the EAs has been revised to provide more-detailed information about socioeconomic effects. Information about grants is available in the Mission Plan (DOE, 1985a, Volume I, Part I, Chapter 4).

Issue

Some persons said that there is no guarantee that the local economy and local employment picture will improve because of the presence of a repository. On the other hand, one commenter noted the economic benefits that could accrue from a repository nearby and wanted assurances that the residents of the local community would have job opportunities. He said that the local business community saw the repository as being beneficial as long as the "boom-and-bust" cycle can be broken.

Response

Although there may be no guarantee of an improvements in the employment situation, such improvements are likely because of improvements in the local economy. Federal procurement law requires the DOE to advertise for, accept bids from, and hire contractors on the basis of competitive bids. However, the DOE will make available to local businesses complete descriptions of the required contract work and will meet with local leaders to describe the project. Where possible, the DOE and the general site contractor may divide contracts into smaller subcontracts to facilitate bidding by local contractors. This approach is being successfully used for the Waste Isolation Pilot Project in New Mexico. Furthermore, local residents may find employment with any outside contractors that may be hired. The DOE will also widely publicize locally business and job opportunities and work with community leaders to provide contract-procurement workshops and vocational training programs.

The DOE plans to take mitigative measures to reduce the impacts of the "boom-and-bust" cycle--the buildings and eventual reduction in local populations that will result from siting a repository in a rural area.

Issue

Some States and communities indicated that mitigation efforts and funds must precede or be concurrent with program activities to avoid adverse impacts. In particular, some potentially affected communities expressed concern that the need to improve community services may occur before impact-mitigation funds are distributed.

Response

The Act does not provide for impact-mitigation funds before repository construction begins, but the Act does allow grants equal to taxes to be provided to units of general local government beginning with site characterization. The DOE will therefore work with States, affected Indian Tribes, and local governments to minimize or avoid adverse impacts and to identify mechanisms for the timely provision of assistance within the authorization provided by the Act. Financial assistance will be provided to States and affected Indian Tribes throughout the construction and operation phases to enable them to mitigate repository-related impacts.

Issue

Some parties were concerned that the grants will be cut and thus will not provide adequate assistance (i.e., the grants will not be equal to the amount lost in the reduced assessments of the value of surrounding land and will not make up for taxes lost as a result of business relocations).

Response

The levels of impact-mitigation funding will be based on assessments of potential impacts, in which local communities will be encouraged to participate. The funding levels agreed on will be based largely on the socioeconomic-impact reports that will accompany the requests of States and

affected Indian Tribes for financial assistance. Included in the impact-mitigation assistance will be grants equal to taxes.

In general, applications for grants will be submitted by the State or the affected Indian Tribe to the appropriate DOE Project Office. The DOE will process these applications as quickly as possible under Federal procurement regulations. When agreement on terms has been reached by the DOE and the State or affected Indian Tribe, the grant will be awarded.

Issue

Commenters requested that the DOE furnish temporary housing for transient workers during site characterization.

Response

With the exception of the Davis Canyon site, adequate housing is expected to be available in the vicinity of the nominated sites during site characterization. The DOE may consider providing temporary housing at the Davis Canyon site if the site is recommended and approved for characterization.

C.2.1.5.2 Land acquisition and property values

The subject of land acquisition and property values was raised by many commenters, who expressed concern about decreases in property values, fair compensation for land acquired from private owners, the uncertainty resulting from a long site-selection process, and similar issues.

Issue

A number of persons expressed concern about the effects of site characterization and repository development on property values. Some made suggestions about the approach to compensation; others wanted to know what the DOE considers reasonable compensation. Some said that the value of property near a site being considered for a repository has already decreased and will continue to plummet as the process continues, but that compensation should be based on the nondepreciated land values that could be expected without the repository project.

Response

The DOE recognizes that some people believe that the value of some lands at or near a potential repository site may have decreased, but there is no concrete evidence of such decreases. However, for the sites that are not recommended for characterization, it can reasonably be expected that property values, if decreased, will return to normal once the site is removed from consideration. At the sites recommended for characterization, private land may be leased or purchased for the characterization phase. If there is private land at a site selected for a repository, the DOE will acquire the land through purchase, at fair market value.

All land-acquisition activities will be performed in accordance with the Uniform Relocation Assistance Act. The DOE will ask for assistance from the U.S. Army Corps of Engineers in the acquisition process because of its extensive experience. The Corps will assess the value of the land, basing the assessments on the value of land that is similar but outside the immediate area. This approach will ensure that the assessment is not reduced by any land-value decreases that may result from the repository project.

Issue

One commenter suggested that a one-mile buffer zone should be established around the site, within which owners could choose to keep their property with compensation from the DOE for its devaluation or sell to the DOE under the same terms as those offered for land at the site.

Response

Land values will be assessed during the studies that will be conducted concurrently with site characterization. At this time the DOE has made no decision about establishing a buffer zone or how compensation in a buffer zone will be handled. If the siting of a repository causes a clearly demonstrated adverse effect on the values of the surrounding land, impact-mitigation funds may be made available as compensation.

Issue

Some felt that landowners who have already sold property at prices depressed by repository siting should be compensated for their losses.

Response

The DOE will examine case by case any claims from landowners who feel that they have received a depressed price for their property because the land is or was being considered for a repository.

Issue

The DOE was asked to issue a specific statement explaining what it considers reasonable mitigation and compensation for relocation.

Response

In providing relocation assistance, the DOE will follow the procedures specified in the Uniform Relocation Assistance Act. Information about relocation procedures has been distributed at meetings of landowners in the Deaf Smith site and is available from the DOE.

Issue

Some commenters urged the DOE to decide on a site as soon as possible because otherwise people cannot make decide about making necessary improvements to their property and do not know whether their lives will be disrupted. One party said that the DOE should "stop casting a cloud" on land titles near potential sites. Another commenter said that the DOE should develop a mitigation policy of indemnifying local citizens against uncertainty.

Response

The siting of a repository requires extensive and detailed study to collect sufficient information and must follow the process outlined in the Act. Therefore, it is not possible for the DOE to decide now which site will be selected. This choice will be made several years from now. However, the DOE believes that landowners should not base decisions about improvements to their property on the anticipation of a repository. If the land is acquired, landowners will be compensated at fair market value, including any improvements that have been made.

Issue

The DOE should arrange an exchange of land with the Bureau of Land Management rather than condemning private farmland for the repository.

Response

The DOE recognizes that the acquisition of private land may have significant impacts on its owners and will follow the provisions of the Uniform Relocation Assistance Act. However, in selecting a site for a repository, the ability of the site to contain and isolate the waste is more important than current land use.

C.2.2 LEGAL AND REGULATORY ISSUES

Most of the issues raised in comments on legal and regulatory matters were concerned with the EPA standards for geologic disposal. Other issues included emergency response responsibilities, liability for accidents, and the applicability of Federal mining regulations.

Issue

Several commenters asked which Federal agencies set standards for radioactive-material releases from the repository.

Response

The Act (Section 121(a)) directs the Environmental Protection Agency (EPA) to develop standards for protecting the general environment from radioactive-material releases from repositories. Responsibility for implementing the EPA standard is assigned to the Nuclear Regulatory Commission (NRC).

The EPA standards were issued in final form as Title 40 of the Code of Federal Regulations, Part 191 (40 CFR Part 191), on August 15, 1985; they were published in the Federal Register on September 19, 1985 (EPA, 1985), and became effective on November 18, 1985. The NRC criteria for implementing these standards were issued as Title 10 of the Code of Federal Regulations,

Part 60 (10 CFR Part 60). They were published on June 21, 1983 (NRC, 1983). Since 10 CFR Part 60 was issued before the Act was passed, the NRC is revising it for compliance with the Act; 10 CFR Part 60 may also change in response to the above-mentioned final EA standard (40 CFR Part 191).

Issue

A number of comments pertained to the postclosure safety of the repository. Some of them asked what levels of radiation are harmful and who determines what levels are not harmful and what is considered to be an acceptable death rate. One commenter objected that, in the absence of individual dose standards, the EPA's population standard is unacceptable.

Response

According to the National Council on Radiation Protection and Measurements (1974), the lowest radiation doses that produce evidence that a person has been affected by radiation are in the range of 75 to 125 rem, which is the "minimal dose likely to produce vomiting in about 10 percent of people so exposed." The individual dose limits set by the EPA for the repository are more than 1,000 times lower. During repository operations, no member of the general public may receive more than 25 millirem (0.025 rem) to the whole body, 75 millirem (0.075 rem) to the thyroid, and 25 millirem to any other critical organ; during the first 1,000 years after closure, the limits are 25 millirem the whole body or 75 millirem to any critical organ. The EPA estimates that, for the first 10,000 years, releases from a repository containing 100,000 MTU of waste would cause no more than 1,000 premature deaths from cancer, or an average of no more than one death every 10 years. The projections for actual repositories are expected to be about 10 times lower. For comparison, it is estimated that about 6,000 premature cancer deaths per year are caused by natural background radiation (radiation from cosmic rays, the rocks in the earth, etc.).

In its final standards, 40 CFR Part 191, the EPA has included individual protection requirements (40 CFR 191.15), which are expressed as the maximum permissible individual dose for 1,000 years after repository closure.

Issue

A few commenters questioned the 10,000-year standard for waste isolation.

Response

The 10,000-year standard was chosen by the EPA because at 10,000 years after repository closure the risk posed by the repository to public health and safety is comparable to the risk from unmined uranium ore.

Issue

Some parties expressed concern that the final EPA standards had not been promulgated at the time the draft EAs were issued.

Response

As already mentioned, the final EPA standards were published on September 19, 1985. These final standards were used in revising the EAs.

Issue

One commenter asked who would be responsible for responding to emergencies during repository operation and waste transportation.

Response

The DOE is responsible for emergency preparedness and response at the repository, as specified in DOE Order 5500.3 ("Reactor and Non-Reactor Facility Emergency Planning Preparedness, and Response Programs for Department of Energy Operations").

Responsibility for emergency preparedness and response in the event of a transportation accident involving radioactive materials is spread among the DOE, the carrier of the waste, and the Federal, State, and local governments. The carrier of the waste has the initial responsibility for "onsite" activities to minimize the hazards to life and property from a possible spill of radioactive materials. State and local governments have the primary responsibility for emergency measures that must be undertaken to protect persons, property, and the environment on lands within the State's boundaries from the threat of harm from an accident involving the transportation of nondefense radioactive waste. Upon request by State or local authorities, the DOE and the Federal Emergency Management Agency will provide assistance in responding to emergency situations. (The DOE's personnel will also respond to emergency-assistance requests from private persons and companies, including transportation carriers.)

In regard to emergency response at the Hanford and the Yucca Mountain sites which are Federal nuclear reservations, any onsite accidents would be the DOE's responsibility, not that of the State or the local jurisdiction.

Issue

Commenters questioned the extent of the Federal Government's liability in case of a transportation accident or an accident at the repository in light of the Price-Anderson Act, which limits coverage to \$570 million. They claim that the sum is inadequate and that the Federal Government must assume 100 percent liability in the case of an accident. The failure to address this indicates the government's unwillingness to realistically address the risks associated with the repository.

Response

The Price-Anderson Act provides liability for damages suffered by the public in the event of nuclear accidents at certain facilities, including DOE contractor-operated facilities. The Price-Anderson Act is now under Congressional review, and the Secretary of Energy has made recommendations for extending liability coverage for activities carried out under the Act. (See Appendix A of the EAs for a more detailed discussion.)

Issue

One commenter wanted to know whether DOE contractors are subject to the Mine Safety and Health Act.

Response

The DOE is not subject to the requirements of the Mine Safety and Health Act but intends to comply with its provisions in the repository program. The decision to construct two exploratory shafts (rather than one) at each site recommended for characterization was based partly on compliance with this regulation.

Issue

One commenter asked whether a repository would be excluded from "public health scrutiny" under the Atomic Energy Act of 1954.

Response

Under the Atomic Energy Act of 1954, all facilities in the commercial nuclear fuel cycle, including repositories, are subject to licensing by the NRC, and for this purpose the NRC has promulgated regulations whose objective is to protect the health and safety of the public. For a repository, NRC licensing is also required by the Act, which also stipulates that geologic disposal must be safe and environmentally acceptable.

C.2.3 PROGRAM MANAGEMENT, COSTS, AND SCHEDULES

Included in the comments on the draft EAs were a number of comments on program management, costs, and schedules. The DOE's schedule for repository siting and development was of concern to many parties, most of whom urged the DOE not to sacrifice excellence for schedule.

C.2.3.1 Program management

The comments on program management were concerned mainly with the potential for conflicts of interest in DOE contractors, peer review of the technical program, the need for a program plan, and assurance that DOE contractors will take the necessary measures to protect the environment.

C.2.3.1.1 Conflicts of interest

Issue

Some commenters stated that contractors with a high financial stake in repository development should not perform analyses for site evaluation. Many commenters suggested that, out of the wide range of available data, the contractors choose to analyze only the data that favorably depict the site. The DOE should either employ different contractors for the analysis of site

data or allow the current contractors to continue with site-data analysis of with the stipulation that they will not be considered for prime-contractor positions for repository construction or operation.

Response

Conflict of interest is a potential problem in any large program where individuals and organizations may have a long-term vested interest in the continuation of the program. However, the repository program is divided into several major phases, and the contracts now in effect are limited to the current phase only (development and evaluation). Furthermore, the contracts of the major support contractors are opened for bids every 5 years. Because of the different skills and experience that will be required for repository construction and operation, many of the contractors for these phases are likely to be different from those involved in site evaluation.

There is little likelihood of biased analyses because the analyses conducted for site evaluation are reviewed by the DOE Project Offices, peer review groups, independent experts hired by other DOE organizations (e.g., the Office of Environmental Compliance, which is under the Assistant Secretary for Environment, Safety and Health), other Federal agencies, and technical experts hired by the States. Documents important to the siting process, such as the draft EAs and the environmental impact statement, are submitted for review by the public. The draft EAs were also reviewed by the Nuclear Regulatory Commission, the U.S. Geological Survey, and the National Academy of Sciences. Finally, the ultimate decision on the suitability of a candidate site will be made by the Nuclear Regulatory Commission, which is continuously reviewing the DOE's work through its staff and consultants.

C.2.3.1.2 Technical peer review

Issue

Several comments referenced a report by the General Accounting Office (GAO) report, issued January 10, 1985, that concluded that the program lacks consistent peer review and that this lack may ultimately subject the DOE's technical analyses to challenges and revisions.

Response

Peer review is an important part of the process by which a repository is sited, constructed, and operated. Peer-review groups have already participated in the early stages of the process. For example, the DOE has assembled a group of independent experts, the Performance Assessment National Review Group, to examine the performance-assessment work of the first repository projects. As the repository program continues, the OCRWM expects to assemble similar groups to examine other parts of the work. Other DOE organizations—for example, the Office of Environmental Compliance—also use independent experts in their review of work sponsored by the OCRWM; their peer reviews are significant contributions to the program. The DOE Project Offices also employ peer review groups in many of the technical aspects of the program.

The States in which a repository may be located also provide independent peer reviews; some of the funds distributed by the DOE as financial assistance to the States are used for that purpose.

Another source of independent peer review is the National Academy of Sciences. This organization has contributed a review of the draft EAs and is expected to contribute further reviews in the future.

The ultimate peer review of the program will be provided by the Nuclear Regulatory Commission. Through its staff and consultants, the Commission will continuously review the DOE work, as it already has the siting guidelines and the draft EAs.

C.2.3.1.3 Need for program plan

Issue

A commenter said that the DOE needs a program plan for waste disposal.

Response

The DOE issued the draft Mission Plan for the Civilian Radioactive Waste Management Program in April 1984 (DOE, 1984a) and the revised plan in June 1985 (DOE, 1985). The Mission Plan describes the objectives and strategies of the program, summarizes current program plans, and summarizes the technical status of the program.

C.2.3.1.4 Protection of the environment

Issue

Some commenters said that government contractors will not spend the money to ensure that the environment is protected during the construction of the repository.

Response

The DOE will oversee all construction activities to ensure compliance with Federal environmental regulations. An environmental plan that specifies procedures to be followed will be prepared for the construction project. Potential impacts are discussed in the EAs. A more comprehensive analysis will be presented in the Environmental Impact Statement, which will also discuss measures for mitigating any significant adverse impacts.

C.2.3.2 Program costs

Several commenters inquired about the total cost of repository development, who was responsible for these costs, and whether the cost of defense-waste disposal would be borne by the Federal Government.

Issue

Commenters asked about the total costs of repository development and waste-management activities.

Response

The costs of the Civilian Radioactive Waste Management Program are divided into four major categories: (1) development and evaluation; (2) geologic repository construction, operation, closure, and decommissioning; (3) transportation; and (4) storage. Estimates of costs for each category depend on the assumptions about such variables as the quantity of waste to be emplaced, the minimum "age" of the waste, the host rock of each repository, the repository design receipt rate, the beginning operation date for each repository, the technology used for waste-transportation casks, and the basis for expressing costs. The figures discussed below were taken from Chapter 10 of Part II of Volume I of the Mission Plan (DOE, 1985a), which discusses in more detail the total costs of managing commercial radioactive wastes.

The costs of development and evaluation (D&E) include all the siting, repository design, testing, regulatory-compliance activities, and institutional activities associated with the repository, waste transportation, and monitored retrievable storage (MRS). The current reference case for total D&E costs is \$7.8 billion (in constant 1984 dollars).

Repository costs include the costs of construction, operation, closure, and decommissioning. Depending on the host rock, the costs of the first repository may vary from \$6.8 billion to \$10.7 billion (in constant 1984 dollars) for the reference cases. The repository costs of the second repository may vary from \$5.8 billion to \$6.1 billion (in constant 1984 dollars).

Waste-transportation costs will be derived from a unit charge for transportation cask use, shipping, and security for each potential transportation pathway. The pathways include transportation from the commercial reactors to each repository, from reactors to an MRS facility (if such a facility is approved by Congress and developed), and from an MRS facility to each repository. The total transportation cost is the sum of these three transportation unit costs. Estimates for transportation costs for the reference cases vary from \$3.3 billion to \$5.1 billion.

Current planning assumptions for an MRS facility estimate the costs at between \$1.6 and \$2.6 billion, or about 5 to 11 percent of the estimated costs of a waste-management system without an MRS facility.

Issue

Commenters asked who is responsible for the costs incurred in constructing the repository. How will these costs be covered and who will pay for the program if the nuclear power plant industry dies out before the closure of the repository?

Response

The Act requires the owners and generators of commercially generated radioactive waste to pay the full costs of its disposal and established a Nuclear Waste Fund to ensure the full-cost-recovery funding of the waste-management program. This Fund receives revenues from an adjustable fee charged quarterly for all electricity generated by commercial nuclear facilities beginning April 7, 1983, as well as a one-time fee, estimated to produce a total of \$2.3 billion, for radioactive waste produced before April 7, 1983. The revenues generated from these two sources, in addition to interest earned from the investment of any surplus in U.S. Treasury securities, are deposited in the Fund, and disbursements are made to cover costs as the program progresses.

Forecasts of future nuclear power generation are incorporated into the management of the Fund. Representative scenarios are presented in DOE documents describing the adequacy of the fund (DOE, 1985c) and analyzing the total-system life-cycle cost for the program (DOE, 1985d).

Issue

Some commenters wanted to know who is responsible for paying for the disposal of defense high-level waste?

Response

As stipulated in the Act, the Federal Government will cover all costs of defense-waste disposal through contributions to the Nuclear Waste Fund (see also Section C.2.6.1).

Issue

Some commenters noted the need for an independent waste-fund audit.

Response

As required by the Act, the Comptroller General of the United States makes annual audits of the Nuclear Waste Fund and submits reports to Congress. An independent audit is also performed for the DOE by a certified public accounting firm. The latest audit covered the period from January 7, 1983 to September 30, 1984, and the results are summarized in the DOE's Annual Report to Congress (DOE, 1985e).

C.2.3.3 Schedule

Many commenters expressed concern that the DOE's schedule for repository siting and development would adversely affect the selection of sites, the consultation process, and the adequacy of the technical data.

C.2.3.3.1 Dependence of site-selection process on schedule

Many comments contended that the mandated repository schedule is driving the site-selection process. Commenters felt that the DOE's schedule is inadequate in that it is an unrealistic list of dates dictated by political decisions rather than by sound geologic site-screening criteria. They requested that the date for the final site selection be postponed and the number of potential repository sites be increased. (See also Section C.3.4.4 for comments on related issues.)

Issue

A number of commenters requested that the date for the final site selection be postponed and the number of potential repository sites be increased.

Response

Being committed to a schedule that will lead to the receipt of waste in 1998 for emplacement in the first repository, the DOE will make every effort to meet intermediate milestones, such as the selection of the site for the first repository, without sacrificing technical excellence.

As explained in Section C.3, the DOE believes that the number of potential repository sites is adequate and in compliance with the requirements of the Act.

Issue

A commenter requested that the DOE recommend that Congress amend the Act to reduce the time constraints in order to allow sufficient time for the entire process.

Response

The DOE recognizes that its schedule is success oriented, but it is also achievable. Hence, a recommendation for an amendment of the Act is not needed.

C.2.3.3.2 Effects on the consultation process

Issue

One commenter said that the DOE could not stay on schedule and conduct a satisfactory program of consultation and cooperation with States and affected Indian Tribes.

Response

As discussed in detail in Chapter 4 of Part I of Volume I of the Mission Plan (DOE, 1985a), the DOE maintains an ongoing program of consultation and information exchange with the States and affected Indian Tribes. The scope of this program is not determined by the overall project schedule. The DOE will

seek to enter into negotiations with States for written consultation-and-cooperation agreements(s) within 60 days after the approval of sites for characterization.

Issue

Some commenters stated that the DOE's tight schedule means closed decisions and no public input.

Response

Recognizing that the schedule is very tight, the DOE is nonetheless fully committed to a process of open and active consultation with all interested parties (see DOE, 1985a, Chapter 4 of Part I of Volume I). Closed decisions are not in the DOE's interest because the schedule can be met only if the States, Indian Tribes, and the public are confident that the siting decisions are sound.

C.2.3.3.3 Effects on the adequacy of technical data

Many comments about the schedule stated that it did not allow time for adequate scientific study and hence might compromise the site-selection process. One commenter doubted that 5 years was enough time for data gathering during site characterization. Conversely, another party noted that the characterization process should follow the mandated schedule so as not to increase costs.

Issue

Many comments objected that the schedule does not allow sufficient time for adequate scientific study.

Response

The DOE cannot meet the schedule without adequate scientific study because it will not be able to obtain an NRC license unless it can demonstrate that the site can meet the standards of the EPA and the technical criteria of the NRC. Furthermore, the DOE believes that it can meet the schedule without sacrificing technical excellence.

Issue

The reference schedule does not allow adequate scientific analyses during site characterization.

Response

The DOE is confident that the schedule for site characterization is adequate.

Detailed plans for the studies to be conducted will be included in the site-characterization plans, which will be submitted to the Nuclear Regulatory Commission, the U.S. Geological Survey, the States, and the public for review.

The Mission Plan (DOE, 1985a) outlines four alternative cases for site characterization in addition to the reference case. Each case identifies and discusses potential delays. The measures that could be used to compensate for these delays are discussed in the draft Project Decision Schedule (DOE, 1985b).

C.2.4 TRANSPORTATION, RETRIEVABILITY, AND SECOND REPOSITORY

C.2.4.1 Transportation

This section presents general, rather than site-specific, comments on transportation and the analyses presented in Appendix A; these comments are national in scope.

Most of the site-specific comments on transportation pertain to the local and regional transportation impacts of repository operation and are discussed in Section C.7.3. Typical examples of the repository-related transportation comments covered in Section C.7.3 include (1) the impacts of constructing repository access routes, (2) the transportation impacts of repository operation on the local and regional population and environment, (3) the suitability of candidate local and regional transportation routes, and (4) the compliance of the site with the conditions of the transportation guideline.

Many commenters said that the Appendix A should contain more-detailed analyses (e.g., route-specific analysis) and more background information (e.g., legislative and regulatory history). The more-detailed analyses will be performed after the necessary data are collected during site characterization; they will be reported in the environmental impact statement that will accompany the recommendation of one site for development as a repository.

The information provided in the EAs is believed to be sufficient to support preliminary findings on the conditions of the transportation guideline and to discriminate among the sites and is in accordance with the requirements of the siting guidelines (DOE, 1984c). For transportation, the types of information that should be used in nominating sites as suitable for characterization are listed in Appendix IV as follows:

- Estimates of the overall cost and risk of transporting waste to the site.
- Description of the road and rail network between the site and the nearest interstate highways and major rail lines; also description of the waterway system, if any.
- Analyses of the adequacy of the existing regional transportation network to handle waste shipments; the movement of supplies for repository construction, operation, and closure; the removal of nonradioactive waste from the site; and the transportation of the labor force.

- Improvements expected to be required in the transportation network and their feasibility, cost, and environmental impacts.
- Compatibility of the required transportation-network improvements with the local and regional transportation and land-use plans.
- Analysis of weather impacts on transportation.
- Analysis of emergency-response requirements and capabilities related to transportation.

C.2.4.1.1 Cost and risk estimates for transportation

Issue

The transportation cost and risk analyses in the draft EAs were generally considered inadequate by many commenters. Specifically, four main inadequacies were identified: (1) the methods and inputs used were not valid; (2) food-chain and water pathways were overlooked; (3) centroids (i.e., points representing the geographical setting of groups of reactors) were used in lieu of actual reactor locations; and (4) route-specific data were not used.

Response

The DOE believes that the methods and input to the cost and risk analyses are valid and that the results provide an adequate basis for comparing the transportation impacts that would result from shipping waste to each of the sites. However, as discussed below and in Sections C.2.4.1.3, C.2.4.1.4, and C.2.4.1.7, some changes in the methods and input were made. The results of these changes are found in Appendix A.

The RADTRAN II radiological risk code was modified to include the food chain, though the overall impact of this exposure pathway is minor. This change is reflected in the results presented in Appendix A. The relative importance of water pathways can be inferred from similar analyses developed for studies of the risk from nuclear reactors. These studies have examined hypothetical accidents with large radionuclide releases to the environment and have shown that water pathways on the average are small contributors to the total health risk from accidents. However, the consequence analysis included in Appendix A does evaluate the radiation doses received from the water pathway. (See also Section C.2.4.1.3.)

In the draft EAs, which considered shipments from reactors to repository only, the sensitivity of the result to the use of centroids rather than individual reactor locations should be small. However, by introducing the MRS facility, the sensitivity may increase. In the final EAs, actual reactor locations were used in lieu of centroids to evaluate the fractions of travel in the various population-density zones because the MRS facility is now included in the analyses. The results in Appendix A reflect this change.

The issue of route-specific analyses is addressed below.

C.2.4.1.2 Route-specific analysis

Issue

The transportation-risk analyses, which were based on national average data, were challenged in many comments as being inadequate and improper for comparing the repository sites. Furthermore, some commenters said that such analyses do not highlight the special impacts on some States through which a large fraction of all shipments to the repository will pass.

Response

The DOE believes that the general methods and national average data used are adequate for this stage of the repository-siting process. Route-specific analyses and an evaluation of the impacts on host States and States along transportation corridors will be included in the environmental impact statement.

The route-specific analyses to be performed in the future will proceed in the following sequence: (1) define important parameters; (2) gather data; (3) develop models as required; (4) perform analysis; (5) consider mitigating measures; (6) report results. Much coordination and cooperation will be required from State governments and Indian Tribes, particularly in the early stages where parameter identification and data gathering will take place.

C.2.4.1.3 Assessment of the consequences of accidents

Numerous comments said that Appendix A should discuss the consequences of accidents that could occur during transportation and recommended that the analysis consider such factors as route-specific anomalies, the cost of emergency response and cleanup, ingestion pathways, and occupational and non-occupational exposures.

Response

The analyses described in the draft EAs were presented in terms of risk, which is the product of the probability of occurrence and the consequences of that occurrence. Consequence analyses had been performed, but their results were used in producing the risk values published and were not presented separately.

For the final EAs, the consequences of accidents were reevaluated, considering the suggestions of the commenters. The results, consisting of both costs and radiation doses, are in Appendix A. The potential impacts of releases to the atmosphere with deposition on land and on a reservoir are evaluated. Also included are the estimated probabilities of the accidents.

Emergency-response and cleanup costs are described in detail in a study prepared for the NRC (NRC, 1980) and thus are not included in the final EAs.

C.2.4.1.4 Maximum exposure of individuals

Several commenters stated that there were plausible scenarios in which an individual would receive more radiation exposure than the maximum dose estimated in Appendix A. Others said that Appendix A should include the maximum exposure received by an individual during an accident.

Response

Elements of the suggestions received have been combined to define a new set of circumstances for estimating the maximum exposure that individuals might receive during shipments to a repository under normal conditions. Similarly, accident descriptions have been developed for estimating the maximum radiation exposure received by a rescue worker and a member of the public. These analyses are presented in Appendix A.

C.2.4.1.5 Modal split for shipments

Several commenters were confused about the percentage of shipments that will occur by truck and by rail. Some analyses assumed that 70 percent of the shipments would be by rail and 30 percent by truck, while most of the analyses assumed for 100 percent by rail or 100 percent by truck. Furthermore, earlier studies were based on 50 percent of shipments going by rail and 50 percent by truck.

Response

Analyses have not been inconsistent. In order to calculate the maximum national impacts of transportation to a repository, two cases were evaluated. One case evaluated the impacts resulting from making all shipments by rail (100 percent rail) and the other from all shipments by truck (100 percent truck). It is expected, however, that during the early years of repository operations rail shipment will be used for no more than about 50 to 70 percent of the total spent-fuel shipments because of the lack of rail spurs at some reactor sites and other limitations. In later years it is expected that reactor capability to ship by rail will be improved, and the fraction of spent fuel shipped by rail will increase to a least 70 percent. In addition, the rail-to-truck ratio will vary from year to year, depending on which reactors are making shipments.

Assumptions of 100 percent by truck and 100 percent by rail will continue to be used, except that for shipments from the MRS facility to the repository only the rail mode will be considered. For national risk and cost impacts resulting from radioactive-material shipments and directly attributed to transportation operations, these cases result in the maximum predicted impact.

C.2.4.1.6 Defense waste

Several commenters stated that the volume of defense waste to be shipped to a repository was understated in the draft EAs. In particular, the EAs only considered the transportation of defense high-level waste from the Savannah River Plant and did not consider transportation from either the Hanford Site or the Idaho National Engineering Laboratory (INEL). One commenter asked about shipping liquid high-level waste.

Response

The final EAs consider shipments of defense high-level waste from the Savannah River Plant, the Hanford Site, and the INEL. Defense high-level waste will not be transported as a liquid nor will separate shipments of krypton-85 or iodine-129 be made.

The transportation of defense high-level waste is discussed in Chapter 5 and Appendix A of the final EAs. This discussion also recognizes that the President has decided that defense high-level waste should be shipped to a civilian repository for disposal; this decision had not been made when the draft EAs were issued.

C.2.4.1.7 Monitored Retrievable Storage

Issue

Some commenters objected that the transportation analysis was inadequate because a facility for monitored retrievable storage (MRS) was not included in the waste-management system considered in the draft EAs.

Response

The MRS facility had not been proposed when the analyses were prepared for the draft EAs. Preliminary transportation analyses indicate that the total number of miles traveled by the cask fleet can be decreased by introducing an MRS facility into the waste-management system. A description of a representative transportation system designed to support the MRS facility was used to estimate transportation costs and risks for a waste-management system with an integrated MRS facility; the results are included in Appendix A. This new analysis supplements, rather than replaces, the analysis for the reference case.

C.2.4.1.8 Barge transportation

Issue

Several commenters objected that the use of barges had not been given any consideration in the transportation risk assessment, calling this a serious deficiency because barge transportation is a discriminator among the potential

candidate sites; some of them felt that this omission was most serious for the Hanford site, which is close to a navigable waterway (approximately 16 miles away).

Response

A discussion of the barge mode is included in Appendix A to the final EAs. The discussion is in two parts: a description of the mode as a feasible alternative that can play a secondary or supplementary role in the transportation of radioactive wastes and a synopsis of a risk and cost study performed by the Argonne National Laboratory (Tobin and Meshkov, 1985) to examine the normal risk of transporting by barge and to examine costs of shipment, including transfers to truck or rail. The set of circumstances considered does not include the shipment of spent fuel from reactors in the East through the Panama Canal to the Hanford site. The discussions explain the premise that barge transport is not a sensitive discriminator among sites, and it is unnecessary therefore to include an exhaustive analysis in the final EAs.

The particular logistics for using barge to transport spent fuel from some reactors near the West Coast to the Hanford site are discussed in the final EA for Hanford.

C.2.4.1.9 Consideration of a second repository

Issue

Some groups were critical of the fact that the EAs did not consider the implications of a second repository on transportation. They postulate that a two-repository system would minimize the overall cost and risk of transportation.

Response

Favorable condition 5 of the transportation guideline is the "total projected life-cycle cost and risk for transportation of all wastes designated for the repository site which are significantly lower than those for comparable siting options, considering locations of present and potential sources of waste, interim storage facilities, and other repositories." The second-repository program has not yet reached the point where potential sites can be identified—in contrast to the MRS facility, where an analysis is now possible because, since the publication of the draft EAs, potential MRS sites have been identified. As a result, the DOE cannot perform rigorous cost and risk analyses analogous to those done for the MRS case. However, certain assumptions about the potential impacts of a second repository can be based on previous studies. A discussion of the potential impacts of a second repository is found in Appendix A.

C.2.4.1.10 The use of existing casks in the EA analysis

Issue

A number of comments challenged the validity of using the characteristics of currently existing and NRC-certified casks for the transportation risk analysis in the draft EAs. The commenters recognized that the design of the new casks to be used for most shipments will reduce the number of shipments because of higher capacities. However, they questioned that the greater quantities of fuel in a single cask would provide a greater source for the release of radionuclides in a serious accident.

Response

The risk and cost assessments for transportation have been reevaluated, using the predicted characteristics of the new family of casks, even though their designs are not yet available. Risks were assessed for both normal and accident conditions, and assumptions that would result in the maximum expected impacts were used. Because of the conservatism in all assumptions, the impacts are similar to those calculated for existing casks, even though the new casks will require fewer miles of travel and fewer shipments. The results are found in Chapter 5 and in Appendix A.

C.2.4.1.11 Adequacy of current cask designs

Issue

Some commenters questioned the adequacy of the design of currently existing casks.

Response

The adequacy of cask design is a regulatory issue, and, since the existing spent-fuel casks have been certified by the Nuclear Regulatory Commission, the DOE has no reason to question the adequacy of their design. The existing casks have carried thousands of shipments without an accident that resulted in the release of radioactive material. The DOE will develop a new family of casks because it seeks to increase efficiency, not because it is concerned about the safety of existing casks. The new-generation casks will also have to meet regulatory requirements for cask design and be certified by the Nuclear Regulatory Commission. A more detailed discussion of the new family of casks is found in Appendix A.

C.2.4.1.12 Additional testing of casks

Issue

Several commenters expressed concern that casks are not sufficiently tested to ensure that the public is safe during transportation. Some suggested destructive testing of full-scale prototype casks.

Response

The Nuclear Regulatory Commission has specified a series of hypothetical accident conditions that a cask must be shown to survive. Survival can be demonstrated through analysis should the designer so choose or through testing, but destructive testing is not mandatory. However, many tests, including full-scale crash tests, have been conducted to verify analytical models. The results of analyses and experiments have been quite close, and hence considerable confidence has been developed in the analytical models used in design analysis.

Casks developed for the shipments to a repository will be certified by the Nuclear Regulatory Commission. The private contractors chosen to design and obtain certificates for the casks will be allowed to choose the manner of demonstrating how their designs comply with NRC regulations. At a minimum, the DOE will use an independent testing laboratory to perform destructive tests of scale models for cask designs as a benchmark or check of structural performance under accident conditions. In addition, nondestructive tests will be performed on each cask during and at the completion of manufacture, and the casks will be inspected before each shipment.

C.2.4.1.13 Cask weeping

Issue

Some commenters said that the phenomenon called "cask weeping" had not been considered in the risk assessments.

Response

The phenomenon of cask weeping can be described as follows: A cask that has been loaded or unloaded in a reactor storage pool becomes contaminated with radioactivity on its surface. Before shipment, the external surface of the cask is decontaminated to levels specified by regulations, but when the cask is inspected on arrival at its destination, contamination above the levels allowed by regulation is found. Though the actual mechanism is not understood, a possible explanation is that, when a cask is repeatedly placed into water-filled spent-fuel storage pools, it becomes contaminated over time, with the contamination penetrating deeper into the pores of the cask body. The cleaning removes the surface contamination, but the contamination that is deep in the pores remains. During the transportation of a loaded cask, the surface can become contaminated again as the deep contamination is driven out of the pores by the heat of the spent fuel inside the cask.

However, the levels of contamination associated with the weeping phenomenon are not high enough to be factored into the risk assessment for transportation, and procedures will be used to effectively preclude this problem during shipments to a repository. For example, wrapping the cask in plastic before entry into reactor fuel storage pools is an effective practice that is currently used. Therefore, weeping is not expected to be a significant contributor to risk during spent-fuel transportation to a repository and is not included in the transportation-risk assessment presented in Appendix A.

C.2.4.1.14 Adequacy of NRC testing requirements

Issue

Several commenters said that the tests that casks must pass to receive NRC certification are not severe enough.

Response

The conditions being challenged are established by the Nuclear Regulatory Commission, and the DOE will continue to rely on the Commission to verify the adequacy of the test conditions.

C.2.4.1.15 Legal impediments

Issue

Two commenters took exception to the DOE's interpretation of State or local restrictions against radioactive-waste transportation as "legal impediments" in favorable condition 7 of the technical guideline on transportation (10 CFR 960.5-2-7). In particular, the U.S. Department of Transportation (DOT) commented that, since its regulation of highway routing of radioactive materials (HM-164) has been established as valid by the U.S. Supreme Court, the only "legal impediment" would be a State or local routing rule that renders compliance with HM-164 impossible but is found not to be preempted under provision 112(b) of the Hazardous Materials Transportation Act (HMTA). If such a finding cannot be made, any State or local routing rule that prevents or seriously impedes compliance with HM-164 is preempted by the HMTA (Section 112(a)).

Response

Favorable condition 7 of the transportation guideline is the "absence of legal impediments with regard to compliance with Federal regulations for the transportation of waste in or through the affected State and adjoining States."

Insofar as the Department of Transportation is the responsible regulatory agency, the DOE defers to its interpretation of "legal impediment." Because State, local, or tribal laws or regulations restricting the transportation of radioactive waste that are inconsistent with either the HMTA or the DOT regulations issued thereunder are preempted by the HMTA, such laws or regulations are not considered legal impediments in the final EAs; a formal nonpreemption determination by the DOT, in response to a specific request, is required for such laws or regulations to become legal impediments. The findings in Chapter 6 reflect this change in interpretation and appropriate rationales for the finding are included in all EAs. A more extensive discussion of HM-164 is presented in Appendix A.

C.2.4.1.16 State designation of alternative routes

Issue

The commenters noted that in Appendix A the EAs contain an incorrect statement—namely, that State designation of alternative preferred routes must be approved by the Department of Transportation. They said that HM-164 does not require States to seek DOT approval of alternative designated routes.

Response

The Department of Transportation requires, under HM-164, that a "preferred route" be used for the transportation of controlled-quantity shipments of radioactive materials. Preferred routes are interstate highways and State-designated alternative routes. Although the States and Indian Tribes must comply with DOT guidelines (or an equivalent routing analysis that adequately considers the overall risk to the public) and consult with affected local jurisdictions, Indian Tribes, and potentially affected adjacent States before establishing a preferred route, there is no requirement to seek DOT approval of alternative designated routes. The EAs have been revised to reflect this in Appendix A.

C.2.4.1.17 Indian Rights

Issue

Several Indian Tribes commented that the EAs failed to recognize the authority granted to tribal governments on federally recognized Indian reservations under the HMTA and the rules set forth by the Department of Transportation in HM-164. One Indian Tribe noted that a ban on radioactive-waste transportation through its reservation constituted a "legal impediment."

Response

The final EAs use the DOT definition of "State routing agency." The DOT rules (HM-164) include appropriate Indian tribal authorities in the definition of "State routing agency" and, as such, allow the governments of Indian Tribes to exercise routing authority in a similar manner as provided for the State governments.

If a ban enacted by an Indian Tribe meets the criteria of the HMTA for nonpreemption, then (as in the case of any State ban) a legal impediment will be present. A more detailed discussion is given in Appendix A, (see also Section C.2.4.1.15).

C.2.4.1.18 Availability of railroads for transporting radioactive waste

Issue

One commenter noted that, though the DOE states that rail carriers are available for shipping radioactive waste, the willingness of the railroads to transport the waste is questionable.

Response

There have been a series of decisions by the Interstate Commerce Commission (ICC), affirmed on judicial review, on this and related issues over the past several years. The Commission has ruled that, as common carriers, the railroads cannot refuse to carry cask loads of spent fuel and to return empty rail casks. Furthermore, this transport must be accomplished in regular train service (as opposed to "special trains," which the Commission has found to be a "wasteful transportation practice"), unless the DOE chooses otherwise.

At this time uncertainty in rail transportation remains in the tariff rates. For eastern railroads, the Commission has upheld a DOE and industry challenge to the published tariff rates and has reduced and set the rate levels. However, for western and southern railroads, the question of rate appropriateness is pending before the Commission. Therefore, the issue does not appear to be whether the railroads will transport radioactive waste, but rather at what rates.

In order to more closely work with the railroads and to understand the concerns that do remain, the DOE has and will continue to invite them to participate in all stages of the transportation program, including the development and testing of shipping casks. Also, the DOE and the Association of American Railroads are planning joint activities to resolve issues.

C.2.4.1.19 Railroad regulations

Issue

A commenter asked for a description of the existing regulations for the transportation of radioactive waste by rail.

Response

Federal regulations regarding the transportation of hazardous material, including radioactive material, can be found in Title 49 of the Code of Federal Regulations, Parts 174.83-174.93. These regulations are concerned with the handling of placarded cars. In particular, for cars containing radioactive material, the regulations deal with the switching of cars, the ban on the use of passenger trains, and the position of cars in a train. A more-detailed discussion of rail regulations is included in Appendix A of the final EAs.

C.2.4.1.20 Dedicated trains

Issue

Several comments concerned the treatment of rail transportation in the EAs. In particular, the commenters objected that discussions and analyses of rail shipments were based on shipping in general commerce rather than by dedicated trains.

Response

Appendix A has been revised to include a general discussion of the use of dedicated trains and an analysis of the risks associated with using dedicated trains for the movement of waste from an MRS facility to a repository.

C.2.4.1.21 Regional transportation analysis

Issue

Federal agencies as well as several States and Indian Tribes criticized the regional transportation analysis, stating that it did not extend far enough from the site to include all of the pertinent impacts, such as weather hazards, the cost of building access routes, the radiological risk, traffic hazards and increased traffic volumes on highways connecting interstate highways with access roads, and possible routes across Indian lands.

Response

The "regional" transportation analysis includes, as a minimum, the routes from the potential site to the nearest interstate highway or mainline railroad; the analysis may be extended beyond that area if the circumstances at the particular location warrant it. However, the intent of the siting guidelines (10 CFR Part 960) is to focus on effects near the site. The estimates of the costs of building access routes will be improved during site characterization. Currently available data on road conditions (e.g., traffic volumes and potential hazards) are presented in the EAs. More-detailed data and a discussion of mitigation measures will appear in the environmental impact statement.

C.2.4.1.22 Weather impacts

Issue

Many commenters criticized the way in which weather impacts were considered in the transportation analysis. Some gave examples of weather-related road closings; others asked about the effect of weather on frequency and severity of accidents.

Response

Weather conditions are considered in favorable condition 9 of the transportation guideline: "A regional meteorological history indicating that significant transportation disruptions would not be routine seasonal occurrences" (emphasis added). This favorable condition is concerned with the absence of routine seasonal conditions that could disrupt repository activities to the extent that the annual waste-acceptance rate could not be met. Weather-related route closures are considered in the final EA, and the analysis of such closures is considered adequate for this stage of the site-selection process. When the number of sites has been narrowed and route-specific analyses are conducted, concerns about occasional weather-related bottlenecks between specific reactors and repository sites can be addressed.

C.2.4.1.23 Potential for human error

Issue

Some commenters stated that the potential for human error in the transportation of radioactive waste is not treated adequately in Appendix A.

Response

The DOE has considered the potential for human error in the assessment of transportation risks. A study prepared for the Nuclear Regulatory Commission (NRC, 1980) analyzed detailed incidents of human error and deviations from accepted quality-assurance (QA) practices in the transport of radioactive materials. The results indicate that the risks from human errors or deviations from accepted QA practices are extremely small (i.e., 0.000012 latent-cancer fatality per shipment-year for packages tested to accident conditions), and thus it is not meaningful to include these risks in the radiological risk analysis for transportation.

C.2.4.1.24 Retrieval of waste

Issue

Commenters asked about the impacts that would result from the transportation of waste retrieved from a repository should retrieval prove to be necessary.

Response

At this stage in the repository-design process, the full impacts of retrieval on transportation requirements are not known. If retrieval proves to be necessary, the spent fuel will be older and less radioactive than at the time of emplacement; it is therefore expected that the transportation of such waste should have less of an impact. A discussion of the retrievability issue in general can be found in Chapter 5.

C.2.4.1.25 Financing infrastructure improvement

Issue

Several commenters suggested that the costs of infrastructure improvements, such as the upgrading or reconstructing of roads or rail lines, should be considered in the cost analysis and that more information is needed on how such improvements would be integrated with local economic development plans.

Response

A preliminary analysis of the need for upgrading or reconstructing local roads and railroads was performed for the comparative evaluation of sites. Related discussions can be found in Chapter 6 of the individual EAs. The condition of local roads or railroads will be established during site characterization; it will be analyzed more rigorously for the environmental impact statement and again before the repository begins operation, and plans for integration into local development plans will be developed.

C.2.4.1.26 Adequacy of the transportation guideline

Issue

Many commenters expressed the opinion that the transportation guideline is not adequate for discriminating among sites. In particular, they stated that the use of legal impediments as a discriminator is inappropriate, as they may change over time; that transportation costs should not be considered in the ranking because they are of minor importance in comparison with transportation risks to the public and the environment; and that the guideline condition discussing weather impacts on transportation in the vicinity of the site should be expanded to include potential disruptions between the reactors and the site. Other commenters criticized the weight given to the transportation guideline, considering the potential impact of transportation.

Response

The siting guidelines (DOE, 1984c) were developed through consultation with affected and interested States, the Council on Environmental Quality, the Environmental Protection Agency, and the U.S. Geological Survey and received the concurrence of the Nuclear Regulatory Commission. The transportation guideline is one of three guidelines in the preclosure group on environmental, socioeconomic, and transportation. This group of guidelines is second in importance to the preclosure group on radiological safety but all the guidelines in any preclosure group are assigned equal importance.

C.2.4.1.27 Inadequate treatment of transportation issues

Issue

Many comments stated that a variety of general transportation issues received inadequate or no attention in either the body of the EA or in Appendix A. Among the issues listed were emergency-response responsibilities, the impacts of using overweight trucks, rail routing requirements, inspection and enforcement, liability, safe havens, advance notification, training, sabotage, NRC safeguards regulations, and the responsibilities of the DOE as the shipper of record.

Response

Many of the topics listed by the commenters are discussed in the EAs, particularly in Appendix A. Since the draft EAs were published, additional policy decisions about several of the issues have been made, and, where additional information is available, the discussion of the issue has been expanded. It should be pointed out, however, that most of these issues, while of concern in the overall context of the transportation program, have little bearing on the site-selection process. They were included in the EAs primarily to give the reader a better understanding of the transportation program. For further information on how the DOE plans to interact with the States, Indian Tribes, and industry to resolve these other issues, the reader is referred to the Transportation Institutional Plan (DOE, 1985f).

C.2.4.2 Retrievability

Several commenters addressed the need and the desire to retrieve spent fuel and high-level waste after emplacement in the repository. The issues they raised include the view that wastes should not be placed where they cannot be retrieved, the DOE's plans for the length of the retrievability period, and the methods to be used in retrieval.

Issue

Some commenters said that at some point the United States may want to retrieve the spent fuel or high-level waste to reuse some of its components or to take advantage of new technical developments. The wastes should therefore not be emplaced where retrieval is not possible.

Response

In compliance with the Act and the NRC criteria for geologic repositories (10 CFR Part 60), the waste will be retrievable for up to 50 years after the emplacement of the first waste. The reason for retrieval would be to protect public health and safety. The DOE does not intend to recover the wastes for their economic value. The commitment to geologic disposal implicitly forfeits the future use of the waste in return for assurance that the waste has been permanently isolated from the human environment.

Issue

A commenter asked whether there is a scientific and political consensus about whether the wastes should be retrievable or permanently disposed.

Response

By mandating geologic disposal, the Act implies a political consensus that disposal must be permanent. The concept of permanent disposal is widely supported by the technical community and is explicit in the NRC and EPA regulations (10 CFR Part 60 and 40 CFR 191, respectively). The NRC requirement for retrievability is directed at demonstrating that the performance of the repository is adequate for permanent disposal.

Issue

Commenters asked that the DOE specify the period during which it plans to be able to retrieve waste.

Response

As required by the Nuclear Regulatory Commission in 10 CFR Part 60.111, the retrieval of waste from a repository will be possible at any time up to 50 years after the start of waste emplacement.

Issue

One commenter wanted to know how retrieval will be accomplished.

Response

If retrieval is necessary, it will be accomplished by reversing the steps taken for waste emplacement. The exact sequence and the equipment to be used for retrieval will depend on the design of the repository, the host rock of the repository, as well as the reason for retrieval (e.g., degree of container failure). Equipment for retrieval will be designed and tested before the license application, and the DOE's retrieval capability will have to be approved by the Nuclear Regulatory Commission.

C.2.4.3 Second repository

A number of comments concerned the location of the second repository and succeeding repositories and asked whether an indefinite expansion of the first repository is an alternative to constructing a second repository. Some parties wanted to know whether sites characterized for the first repository or sites not nominated for characterization for the first repository could be potential sites for the second repository. Others wanted to know why crystalline and argillaceous rocks were not considered for the first repository.

Issue

Commenters asked where the second repository will be located and whether both repositories could be located in the same State.

Response

With the exception of sites that were nominated but not recommended for characterization, the DOE may consider for the second repository any site previously considered for the first repository that was (1) not disqualified and (2) not selected for the first repository. The DOE is considering sites in crystalline-rock bodies in the eastern United States and announced 12 potentially acceptable crystalline sites as suitable for further consideration for the second repository (DOE, 1986).

The Act and the siting guidelines specify that the DOE must consider regionality in selecting the site for the second repository. It is therefore unlikely that the first and the second repository will be located in the same State.

Issue

A commenter wanted to know what will prevent an indefinite expansion of the first repository as an alternative to constructing a second repository.

Response

The Act allows the first repository to accept no more than 70,000 metric tons of uranium or the equivalent waste from reprocessing until a second repository is in operation.

Issue

Commenters asked for clarification on whether sites characterized for the first repository but not selected for the first repository can be considered for the second repository.

Response

The Act specifically states that sites that have been characterized for the first repository and are suitable but were not chosen for the first repository may be considered for the second repository. It is expected that all three sites characterized as part of the selection process for the first repository will be found suitable. The fact that only one of the three sites characterized is chosen for the first repository does not mean that the other sites are significantly less suitable.

Issue

The DOE should clarify whether potentially acceptable sites not nominated for characterization for the first repository can be nominated for characterization for the second repository.

Response

The Act permits the four sites designated as potentially acceptable sites but not nominated as suitable for site characterization to be considered as potential sites for the second repository. Whether they survive the selection process for the second repository will depend on the merits of those sites vis-a-vis other potential sites.

Sites that were nominated, but not recommended for site characterization, are not eligible to be considered for the second repository.

C.2.5 OTHER WASTE-MANAGEMENT ACTIVITIES

This section presents comments and responses on monitored retrievable storage, which the DOE plans to propose to Congress as an integral part of the waste-management system, the storage of spent fuel at the site of the reactors, and the reprocessing of spent fuel for the recovery of uranium and plutonium.

C.2.5.1 Monitored retrievable storage

A number of comments were concerned with retrievable storage, the DOE's plans for a facility for monitored retrievable storage (MRS), and the lack of information in the draft EAs about the role of an MRS facility in the overall waste-management system. Several commenters recommended that the DOE consider monitored retrievable storage as an alternative to permanent disposal. Some commenters requested information on the possible locations of the MRS facility.

Issue

The DOE should consider the retrievable storage of spent fuel in a facility where it can be monitored.

Response

The DOE has indeed considered of the need for, and the feasibility of, monitored retrievable storage, and was required to do so by the Act. The DOE considered alternative roles and schedules for MRS facilities and has assessed their value to the waste-management system. Specifically, the DOE evaluated a backup MRS facility to be constructed only if there is a significant delay in the repository program and an integral MRS facility that would receive and prepare spent fuel for disposal. Both options have been compared with the currently authorized system, which does not include an MRS facility. Early in 1986, the DOE expects to propose to Congress the construction of an MRS facility as an integral part of the total waste-management system.

Issue

Some parties said that the draft EAs lacked information about the role of an MRS facility in the waste-management system and suggested that the DOE discuss the possible locations for the MRS facility.

Response

The principal functions of an MRS facility would be to receive and prepare the waste for disposal, thus eliminating the waste-preparation functions from a repository, to serve as a hub for transportation operations, and to provide temporary storage.

After issuing the draft EAs, the DOE concluded that monitored retrievable storage should play an integral role in the waste-management system. Section 3.2 of Part I of Volume I of the Mission Plan (DOE, 1985a) describes this integral MRS concept and plans for its development.

On April 26, 1985, the DOE selected three candidate sites in Tennessee for an MRS facility (DOE, 1985g). The preferred site is the site of the canceled Clinch River breeder reactor; alternative sites are a site on the DOE's Oak Ridge Reservation and the site of the canceled Hartsville nuclear power plant.

The introduction to Chapter 5 of each EA has been augmented to discuss the role of the MRS facility, and the transportation analyses have been expanded to treat the effects of using an MRS facility.

C.2.5.2 Onsite storage

Some commenters asked about the potential for long-term or permanent storage at the power plants that generate the wastes as an alternative to transporting wastes over long distances. Other commenters suggested that the DOE should continue storage in existing spent-fuel pools.

Issue

Commenters said that the DOE should consider developing repositories near the reactors generating the waste instead of in one or more central repositories.

Response

Nearness to the reactors generating the waste is not an acceptable criterion for siting repositories. The principal criteria are those embodied in the siting guidelines: waste containment and isolation from the accessible environment after closure; preclosure radiological safety; suitable environmental, socioeconomic, and transportation conditions; and ease and cost of construction, operation, and closure. Even if sites meeting the siting guidelines could be found near the reactors, it would be imprudent and impractical to develop many repositories. In addition to requiring very large

expenditures, a multiple-repository program would require acceptance of many States and individual licenses for multiple facilities, long-term safety of each repository—a task that is formidable even for one repository. Two centralized repositories, as currently planned, would be able to accommodate all the waste and would solve the national problem of radioactive-waste disposal at reasonable cost.

Issue

The DOE should consider continuing storage in existing spent-fuel storage pools at reactor sites.

Response

In accordance with the Act, the DOE encourages the efficient use and expansion of at-reactor storage. At-reactor storage and the expansion of the on site capacity for that storage are the prime responsibility of the plant operators and owners, and not of the Federal Government. The Federal role is to encourage and expedite, where necessary, the expansion of that storage capacity until the spent fuel is shipped for emplacement in a repository for permanent disposal. However, the Act specifies geologic repositories as the means for permanent disposal and requires the DOE to site two repositories. Onsite storage is to be provided for a limited amount of fuel (1,900 metric tons of uranium) if any utility requests it and the Nuclear Regulatory commission determines that the utility is eligible. The DOE's program for such Federal interim storage is discussed in the Mission Plan (DOE 1985a, Vol. I, Part I, Chapter 3).

The storage of spent fuel in storage pools at reactor sites is safe for the purpose for which the pools were designed. Spent-fuel pools are meant to provide temporary storage, not an alternative to permanent disposal.

C.2.5.3 Reprocessing

Some commenters asked about the feasibility of reprocessing spent fuel, the use of stabilizing matrices for high-level waste, and the possibility of retrieving wastes from a repository for reprocessing. Other commenters wanted to know whether the wastes from the repository could be applied to any useful purpose.

Issue

Commenters questioned whether there are ways to recycle the components of the spent fuel or waste to be placed in the repository or in some way reverse the process of creating radioactive materials.

Response

There is no practical way known today of reversing the process that creates radioactive materials. The spent fuel could be reprocessed to remove the plutonium and uranium for use in other reactors. However, that does not substantially reduce the volume, heat generation, or radioactivity of the

material requiring disposal. Currently there are no plans for reprocessing spent fuel. The DOE is planning to accept spent fuel for disposal with no intent to retrieve it for reprocessing unless required to do so for the purposes of recovering economically valuable as required by the Act.

Both President Ford and President Carter imposed a ban on reprocessing commercial spent fuel in the United States in response to concerns that the recovered fissile could be diverted to foreign nations or terrorists and used in making nuclear bombs. President Reagan lifted the ban on commercial reprocessing on October 8, 1981, but it is current U.S. policy that the reprocessing of spent fuel from nuclear power plants must be a private-sector enterprise. Because of the lack of economic incentives, industry concern about licensing uncertainties, and the potential for changes in government policy, there is little industry interest in reprocessing.

Issue

Commenters feared that the spent fuel and high-level waste in the repository will be dug up for reprocessing and be reused.

Response

As already mentioned, the DOE plans to accept spent fuel for disposal with no intent to retrieve it for reprocessing unless required to do so for the purposes of recovering the economically valuable resources, as required by the Act. However, the Act requires the repository to be designed and constructed to permit the retrieval of any spent fuel emplaced in the repository during an appropriate period of operation of the facility. The reasons for such retrieval, may pertain to public health and safety, the environment, or the recovery of the economically valuable contents of the spent fuel. In addition, the Nuclear Regulatory Commission requires that the waste emplaced in the repository be retrievable for 50 years after the start of waste emplacement, and the satisfactory completion of a performance-confirmation program. The DOE will comply with these requirements.

Issue

Some comments recommended that glass or ceramic matrices be used to immobilize high-level waste.

Response

All of the high-level waste to be accepted by the repository--the defense high-level waste and the commercial high-level waste from the West Valley Demonstration Project--will be in the form of borosilicate glass.

Issue

Some commenters expressed concern that the materials in the repository will be used to make bombs.

Response

The nuclear materials for weapons are obtained from defense reactors specifically designed to produce such materials. The spent fuel from power reactors is much less useful in the manufacture of modern nuclear weapons, and the DOE has no intention of using it for this purpose.

C.2.6 TYPES OF WASTE TO BE RECEIVED AT A REPOSITORY

A number of commenters asked about the nature of the wastes to be received at the repository. Other comments concerned the effects of slower or faster rates of waste generation and the minimum age of the spent fuel to be emplaced in the repository.

Issue

Commenters wanted to know what kinds of waste are to be emplaced in the repository.

Response

The Nuclear Waste Policy Act, which authorizes the construction of the repository and prescribes procedures for its siting and financing, specifies that the repository is to accept high-level waste and spent fuel. Thus, the wastes that will be accepted by the repository will consist of spent fuel from commercial nuclear power plants, solidified high-level waste from the reprocessing of nuclear fuel from defense reactors, and a small amount of commercial high-level waste from a demonstration facility at West Valley, New York. Also emplaced in the repository will be the low-level waste that is generated at the repository during operations. If spent fuel is consolidated before emplacement in a repository, the repository may also accept some or all of the fuel-assembly hardware that will be left by the consolidation process. No other low-level waste, such as the waste from research centers, hospitals, and general industry, will be accepted. Although the Act does not forbid it, the DOE does not at present plan to accept foreign wastes for disposal in the repository. The acceptance of foreign wastes requires a report to Congress.

The volume of the waste will be such that two repositories are expected to meet the requirements for disposal well into the twenty-first century.

Issue

Commenters wanted to know how changes in the rates of waste generation would affect the operation of the repository.

Response

The duration of operations at the repository will be determined to a large extent by the rate of waste. The currently projected operational period of 28 years for the first repository will not be affected by changes in the rate of waste generation because much of the waste that will go into the first repository will exist by the time the repository starts accepting waste. The

length of operations at the second repository will be determined to a larger extent by its planned capacity and the rate of waste generation in the twenty-first century. The rate of receipt of wastes at the repository will have an impact on employment during the operations phase of the repository, but the impact will be relatively minor.

Issue

The EA analyses are based on 10-year-old spent fuel, but the DOE is committed to accept spent fuel as early as 5 years after it leaves the reactor.

Response

The DOE's contracts with the utilities obligate it to accept spent fuel that is 5 years old or older. The current DOE specification of generic requirements for repositories shows 5-year-old fuel as the baseline for design. The analyses reported in the EAs are based on an earlier assumption that only fuel that is 10 years old or older would be emplaced in the repository. The DOE has not yet performed an analysis for 5-year-old fuel. The final EAs have been revised to add a discussion that explains the DOE's plans to perform analyses for 5-year-old fuel in the repository and the possible impact of an MRS facility on the age of the spent fuel emplaced in the repository.

C.2.6.1 Defense waste

A number of commenters addressed the status and potential impacts of plans to accept defense high-level waste in the repositories.

Issue

Some persons wanted to know how the decision made to include defense high-level waste in the repository was made.

Response

In compliance with the Act, the Secretary of Energy reported to the President, in January 1985, the results of a study showing that there are no clear health and safety, transportation, public acceptance, regulatory, or national-security advantages or disadvantages associated with a separate repository for defense high-level waste and that there are clear cost advantages to emplacing defense and commercial wastes in the same repository. The President agreed with the Secretary's findings that a separate repository is not necessary for defense high-level waste. Therefore, in accordance with the Act, the Secretary of Energy is proceeding to arrange for the use of repositories developed under the Act for the disposal of defense waste. The evaluation report was released for general distribution in June 1985 (DOE, 1985h).

Issue

Many commenters felt that the subject of defense waste was not adequately covered in the draft EAs.

Response

The draft EAs did not contain much information about defense-waste disposal in the repositories, because the report on the subject (DOE, 1985h) was sent to the President in January 1985 (after the publication of the draft EAs), and the Presidential decision to include defense waste in the repository was made after that date.

It is important to note that defense high-level waste presents a lower radiological hazard per unit volume than does commercial high-level waste or spent fuel and a much lower heat-generation rate. The radiological risk analyses in the draft EAs, which are based on the assumption that only civilian waste will be accepted, therefore overestimate the risk of a repository containing both commercial and defense high-level wastes.

Some changes have been made to the EAs to reflect the decision to emplace defense waste. These include the addition of an entry in the tables on the incremental impacts of alternative repository designs. This new entry deals with the addition of defense waste. For consistency, these tables all appear at the beginning of Chapter 5 in the final EAs.

Issue

Several parties wanted to know who would pay for the costs of defense-waste disposal.

Response

The Act requires that, if defense waste is emplaced in any of the repositories developed under the Act, then a proper share of the costs of developing, constructing, and operating the repository is to be paid by the Federal Government into the Nuclear Waste Fund, which is used to finance the activities required by the Act.

Issue

Some persons asked whether the same safety standards will be applied to both defense and commercial high-level wastes.

Response

The January 1985 report to the President on the use of commercial repositories for the disposal of defense high-level waste (DOE, 1985h) stated that all defense waste to be disposed of will be in a form that satisfies the regulations governing the repository--namely, 10 CFR Part 60 (NRC, 1983), 10 CFR Part 960 (DOE, 1984c), and 40 CFR Part 191 (EPA, 1985).

Issue

Many commenters asked about the nature of defense high-level waste and the effect of its emplacement in the repository.

Response

Defense high-level waste results from the reprocessing of spent fuel. It differs significantly from commercial high-level waste and spent fuel because it has much lower concentrations of radioactive fission products and hence a much lower rate of heat generation. The 20,000 packages of defense high-level waste expected to be produced by the year 2020 are considered equivalent to 10,000 metric tons of uranium (MTU) of spent fuel. At the end of 1982, approximately 15 percent of the total radioactivity in spent fuel and high-level waste in the United States was from defense activities; most of the remaining 85 percent was from commercial spent fuel. By the year 2000, the amount of radioactivity in the defense waste is expected to drop to 3 percent of that of all wastes to be accepted by the repository.

In his report to the President (DOE, 1985h) on the potential uses of the repositories for defense high-level waste, the Secretary of Energy explained the DOE's interpretation of the capacity limit (70,000 MTU) imposed by the first repository until a second repository is in operation; the DOE's interpretation is that the limit applies to total quantity of waste—that is, both commercial and defense waste. The analysis in the report assumed that the first repository would accept the 10,000 MTU equivalent of defense waste and 60,000 MTU of commercial waste and that the second repository would be in operation before the 70,000-MTU limit was reached. The report also said that, if all the defense-waste canisters expected to be produced by 2020 were emplaced in one repository with a capacity of 70,000 MTU, it would occupy only about 10 percent of the volume of repository. This fact is attributed to the low heat-generation rate of defense waste, which allows closer spacing between canisters than that for spent fuel. Thus, the inclusion of defense-waste canisters produced by 2020 will not necessitate any significant expansion of the repository. The Mission Plan (DOE, 1985a) includes a schedule for the acceptance of commercial and defense wastes in the first two repositories.

Issue

Commenters wanted to know about the origin of defense and commercial waste.

Response

Defense high-level waste results from reprocessing of spent fuel at DOE facilities. Commercial high-level waste and spent fuel come from nuclear power plants operated by electric utilities.

Issue

Commenters alleged that the DOE withheld the defense-waste report (DOE, 1985h) to make it appear that defense waste would be disposed of separately from commercial wastes.

Response

The DOE was required by the Act to submit a report to the President on the feasibility of combining defense and commercial waste in the repository. This report was released before the deadline (January 7, 1985), mandated by the Act. The DOE was not required to circulate the report for public comment before it was issued, but the report has been available to the public on request since its release was announced in the Federal Register (DOE, 1985i).

Issue

Some commenters were concerned that the repository might become a military operation because of the disposal of defense waste.

Response

The repository will not become a military operation. The defense wastes are produced at facilities operated by the Department of Energy, not the Department of Defense. Furthermore, there are no plans at present to use additional security measures because of the disposal of defense waste. Normal security measures taken to protect spent fuel during receipt and emplacement will be sufficient for protecting defense high-level waste. These security measures will not interfere with the liberties of citizens in the surrounding areas and will probably not involve military personnel in any capacity.

Issue

Some persons asked whether defense high-level wastes from Hanford will be disposed of in the repository.

Response

Defense wastes from Hanford, the Idaho National Engineering Laboratory, and the Savannah River Plant will be disposed of in the repository. Appendix A in the EAs has been changed to reflect that fact.

C.2.6.2 Foreign waste

Issue

Commenters asked whether foreign wastes will be emplaced in the repository.

Response

Although the Act does not specifically forbid the acceptance of foreign wastes at the repository, the DOE has no plans to do so.

C.2.6.3 Other wastes

Issue

Several persons wanted to know whether the repository will accept low-level radioactive waste from various sources or wastes, other than spent fuel, generated from the decommissioning of nuclear power plants.

Response

The Act authorizes the DOE to site and construct a repository for high-level radioactive waste and spent fuel. Wastes from the decommissioning of military or commercial nuclear reactors are not considered high-level waste at present, and therefore these wastes will not be accepted in the repository. Instead, these wastes are considered low-level wastes.

C.2.7 THE DRAFT ENVIRONMENTAL ASSESSMENTS

Many comments were concerned directly with the EAs. The issues they raised included the format, content, organization, consistency, and documentation of the draft EAs. In addition, many of the comments offered editorial suggestions; all of these were carefully considered in revising the EAs.

C.2.7.1 General comments on the environmental assessments and their function

Some commenters asked why the EAs were issued or why they preceded the DOE's Mission Plan and the EPA final standards. Others objected to their size and complexity, alleged inaccuracies, or incompleteness.

Issue

Some commenters questioned the place of the environmental impact statement (EIS) in the siting process, asking why environmental assessments were prepared rather than an EIS.

Response

The Act specifically requires an EA to accompany the nomination of a site as suitable for characterization (Section 112(b)(1)(E)). An environmental impact statement is one of the documents that will accompany the Secretary's recommendation to the President of one site for development as a repository.

Issue

Commenters pointed out that the Act requires the DOE to prepare a mission plan that would provide a base of information for the site evaluation and selection process. They questioned whether the draft EAs, and the preliminary site nomination and recommendations they contain, should have been prepared before the issuance of the mission plan.

Response

Section 301 of the Act requires the DOE to develop a mission plan that provides sufficient information for informed decisions in carrying out the repository program. A draft mission plan was issued in April 1984 (DOE, 1984a), 8 months before the draft EAs. The revised mission plan was issued in June 1985 (DOE, 1985a) and was used in revising the final EAs. The process and schedule established by the Act, however, did not allow the draft EAs to be delayed until the mission plan was published.

Issue

Several commenters stated that the EAs do not satisfy the requirement of the Act to identify unresolved technical issues and the problems that impede the implementation of the Act. In addition, they felt that the DOE's response to data gaps had been to say that issues would be settled in the final EAs.

Response

Although not required by the Act to do so, the EAs do identify the unresolved issues with regard to the siting guidelines; these issues are discussed in Chapter 6 of the EAs. The DOE believes that the findings made for the guidelines are based on sufficient data and information; the findings made at this stage of the site-selection process are to be based on available information. Definitive data will be collected during site characterization.

Some of the statutory requirements identified by the commenters pertain to the DOE's Mission Plan, not the EAs. Among them are requirements to identify unresolved issues and problems that may impede the implementation of the Act (see Sections 301(a)(2) and (3) of the Act). These requirements are addressed in Chapters 2 and 3, respectively, of Part II in Volume I of the Mission Plan (DOE, 1985a).

Issue

A commenter suggested that the DOE issue another set of draft EAs. The commenter expressed concern that the EAs would be so extensively rewritten in response to public comments that the public should be allowed to review the revised EAs in draft before they are issued in final form.

Response

The DOE will not reissue the EAs in draft for comment for the following reasons. First, most of the changes in the final EAs were made in response to public comments and are explained in this comment-response appendix. Second, the final EA is a final agency action and is therefore subject to judicial review. Third, the DOE believes that it has been responsive to comments on the draft EAs and that an additional comment period would not result in further significant improvements. Finally, interested parties will have additional opportunities to comment on the site-selection process through hearings and comments on the site-characterization plans, the environmental impact statement, and other program documents.

Issue

A number of comments implied that the DOE treated the EA process in a perfunctory manner. Some commenters felt that the DOE did not produce EAs that met the intent of the Act; some even stated that the documents were worthless.

Response

The Act requires the following six major assessments to be included in the EAs:

1. An evaluation by the Secretary as to whether the site is suitable for site characterization under the guidelines.
2. An evaluation by the Secretary as to whether the site is suitable for development as a repository under each such guideline that does not require site characterization as a prerequisite for the application of such guideline.
3. An evaluation by the Secretary of the effects of site-characterization activities at the site on public health and safety and the environment.
4. A reasonable comparative evaluation by the Secretary of the site with the other potentially acceptable sites.
5. A description of the decision process by which the site was recommended.
6. An assessment of the regional and local impacts of locating the repository at the site.

The EAs contain all of these evaluations or descriptions.

The DOE went beyond the requirements of the Act in issuing draft EAs and revising the documents in response to the comments, which required substantive changes. The EAs provide a workable data base for site nomination and recommendation for characterization.

Issue

Commenters said that the draft EAs, and the preliminary site nominations and recommendations they contain, should not have been prepared before the issuance of the final NRC and EPA standards for geologic disposal.

Response

The Act requires the Environmental Protection Agency to establish standards for protecting the public from the radioactive material in geologic repositories. These standards are to be implemented and enforced by the Nuclear Regulatory Commission. The EPA standards are contained in 40 CFR Part 191. The NRC technical criteria for implementing the EPA standards are contained in 10 CFR Part 60. Both sets of regulations were issued in draft

form in 1982 and were used in developing the siting guidelines. The final NRC criteria were released in June 1983, before the draft EAs; the final EPA standards were released in September 1985, after the draft EAs. The schedule requirements of the Act did not allow the draft EAs to be delayed until September 1985, but the final EPA standards were used in revising the EAs.

Issue

Many commenters felt that the size and technical complexity of the EAs discourage review by the public.

Response

The EAs are indeed long documents that contain many technical discussions. Their length is the result of an attempt to present as much information as was deemed necessary for compliance with Appendix IV of the siting guidelines (DOE, 1984c), which specifies what kinds of information should be used to support findings about compliance with the guidelines, and as much information as was needed for the evaluations required by the Act. For the same reasons, much of the material presented in the EAs, especially in Chapter 6, is of necessity technical because it presents evaluations of sites against the various conditions specified in the guidelines—conditions that are usually specified in technical terms. Every effort was nonetheless made to make the technical presentations clear and comprehensible.

Issue

Some parties criticized the organization of the EAs, saying that it was confusing to find certain topics discussed in more than one chapter.

Response

The organization of the EAs was based on (1) the requirements of the Act, which specifies, in Section 112(b)(E), the evaluations, descriptions, and analyses that are to be included; (2) the requirements of the siting guidelines, which specify the order of certain evaluations (e.g., the identification of the preferred site in a geohydrologic setting); and (3) the general format and content usually followed in preparing environmental assessments.

Thus, Chapter 2 includes an evaluation of the site against the disqualifying conditions of the guidelines as required by the guidelines; for completeness, this evaluation is repeated in Chapter 6, which presents the Act-mandated evaluation against the guidelines. Chapter 7, which is also required by the Act, of necessity repeats some material contained in Chapter 6, though in a greatly abbreviated form. The repetition is unavoidable because Chapter 7 is essentially a summary compilation and comparison of the data presented in Chapter 6 for every site. A few commenters felt that the EAs should include more information in Chapter 5 about the financial effects of site characterization and repository development on local communities and the grant programs applicable to individual sites.

Issue

One commenter asserted that the analyses performed by a former DOE contractor that was fired for unsatisfactory performance were nonetheless used to substantiate the draft EAs.

Response

The commenter is incorrect in asserting that the work of a "fired" DOE contractor was used to substantiate the draft EAs. The DOE contractor in question was a general program-management contractor that prepared area-characterization studies. This contract expired and was opened for bids according to Federal procurement regulations. The contractor was not selected for further work, but was not dismissed for unsatisfactory performance as the commenter alleges. The DOE considers the analysis performed by this contractor to be valid and useful.

Issue

Some commenters suggested that technical review groups should be assembled to verify the data, procedures, assumptions, and conclusions in the draft EAs.

Response

Technical review groups were used to review the EAs at several levels. Such groups were used by the DOE Project Offices that prepared the EAs, by the Office of Civilian Radioactive Waste Management and its contractors, and by the Office of Environmental Compliance of the DOE's Assistant Secretary for Environment, Safety and Health.

Issue

Some commenters objected that, although a significant percentage of the residents in the area of Swisher and Deaf Smith Counties, Texas, are Spanish-speaking, the reports were released only in English.

Response

To translate documents as long and complex as the EAs would require an expenditure of time and resources that could not be justified. However, the DOE is preparing a variety of public-information materials in Spanish in response to requests to provide information to the Spanish-speaking residents of Texas. The DOE expects that, by being prepared especially for the general Spanish-speaking public, these materials will prove to be a more practical means of access to information about the program than the EAs.

Issue

Some parties suggested that the DOE publish an abbreviated version of the EAs.

Response

Like the final EAs, the draft EAs contained an executive summary that briefly described the site, the process by which it was selected, and its evaluation against the guidelines. These executive summaries were also distributed separately as overviews. Overviews are also available for the final EAs.

Issue

Commenters complained that the DOE issues inaccurate reports, expecting the States and the general public to find the inaccuracies without paying for these services. Others said that the EAs are propaganda for the program and do not present scientific findings.

Response

The DOE tried hard to ensure that the draft EAs were correct, including several reviews by the DOE, its contractors, and peer review groups. However, in documents of the size and the scope of the EAs, some errors are bound to occur.

The objective of issuing the draft EAs, which was not required by the Act, was to increase the participation of the public in the siting process and to apprise the public of the bases for decisions in the siting process. Though the DOE is pleased to acknowledge the many helpful contributions made by the commenters, in no sense did the DOE view the publication of draft EAs as a means of obtaining free services from the general public.

Issue

Some commenters expressed the view that the technical inaccuracies in the EAs caused the public to lose confidence in the entire process.

Response

The draft EAs represent the best available information. In accordance with the Act, they were prepared before site characterization and hence before many site-specific data were available. During site characterization and the concurrent environmental and socioeconomic studies, the DOE will collect the detailed information required to demonstrate compliance with the guidelines and with NRC and EPA regulations. Even with thorough and repeated critical reviews by different parties, some technical inaccuracies are unavoidable in documents as large and complex as the draft EAs, especially since some of the analyses were based on information from the literature rather than studies performed at the site. As already mentioned, every effort was made to correct the inaccuracies in the final EAs.

Issue

Some commenters objected to the use of averages instead of worst-case scenarios in the EAs.

Response

The use of averages is appropriate, especially for this stage in the site-selection process. For nomination and recommendation of sites for characterization, the siting guidelines (10 CFR Part 960) require only that the evidence available does not support findings that the sites are unsuitable. At any stage, worst-case analyses that are not accompanied by information on the probabilities of those cases are inappropriate. The EPA has recognized the latter fact in its environmental standards for the disposal of spent fuel and other wastes. In those standards, specific probabilities of compliance—representative of less than worst-case scenarios—are required.

C.2.7.2 Supporting references

A number of comments were directed at the references that support the analyses and results presented in the EAs. Among these were comments objecting that these references were not available to the public or that the quality of the references was poor.

Issue

Some persons stated that the public was not able to participate fully in the evaluation of the EAs because it was not provided with the data base that supports the decisions.

Response

The reference documents for the draft EAs are available in the public reading rooms of DOE Headquarters and Project Offices (see Appendix B) and were mailed to each affected State and Indian Tribe for review.

Issue

Commenters said that some of the references that supported the draft EAs were either completely unavailable or were not released until half-way through the 90-day comment period. This delayed release did not allow the States and interested parties adequate time for review.

Response

The DOE made every effort to make references available for public review by collecting them in DOE public reading rooms. Some of the references were in draft form at the time the draft EAs were published and were not available for public review until later in the comment period. These were added to the collection as they became available. All references cited in the final EAs are available for review at the locations listed in Appendix B.

Issue

Some commenters contended that the quality of the references was poor; some analyses relied on personal communications for support, rather than published documents.

Response

In the absence of published data, it was occasionally necessary to rely on documents in preparation or on personal communications from the investigators performing the analyses for the EA. Personal communications, DOE memoranda, and DOE correspondence were also used to document the site-selection process, and communications obtained in interviews with representatives of local governments were used as sources of information about local conditions (e.g., availability of community services) for which no published data are available. These informal references could have been cited parenthetically in the text or presented in footnotes. The DOE decided, however, to treat them as formal references and to make them available to the public together with the formal references to published documents. The locations where these references are available for review are given in Appendix B.

Issue

Commenters requested that a list of references for Chapter 7 be included in the EAs.

Response

Since Chapter 7 is based on the information given in Chapter 6 and does not rely on additional sources of data, no references are included. Otherwise it would have been necessary to combine five long lists of references (those presented in Chapter 6 of the EAs for the nominated sites). The reader interested in the supporting data for the findings on which Chapter 7 is based should refer to the section of Chapter 6 that covers the particular guideline of interest.

Issue

A commenter requested that the final EAs list the locations where copies of the references cited in the EAs can be examined.

Response

At the public briefings held in each affected state, the DOE distributed booklets listing the locations where copies of draft-EA references were available. In response to the above request, a list of all locations where copies of references can be examined is given in Appendix B of the final EAs.

Issue

Some commenters pointed out that additional reference material was submitted for DOE review and requested that specific reports and lists be used in the final EAs.

Response

The DOE recognizes and appreciates the efforts expended in sending materials for review. The documents were directed to the appropriate EA authors to be considered in revising the EAs.

During the Utah hearings, several persons read pages from the log book for visitors to the Canyonlands National Park. The comments of the tourists were entered into the official EA comments and were considered in reanalyzing for the final EA the potential effects of a repository on tourism.

References that were not within the scope of the Civilian Radioactive Waste Management Program were forwarded to the appropriate persons in other DOE programs.

C.2.7.3 Content of the environmental assessments

Issue

Among the comments was the objection that the draft EAs did not list the rankings of all nine sites studied.

Response

As discussed in Chapter 1 of the environmental assessments, the siting guidelines specify the following steps for ranking the potentially acceptable sites:

1. Evaluate the potentially acceptable sites in terms of the disqualifying conditions specified in the guidelines.
2. Group all potentially acceptable sites according to their geohydrologic settings.
3. For those geohydrologic settings that contain more than one potentially acceptable site, select the preferred site on the basis of a comparative evaluation of all potentially acceptable sites in that setting.
4. Evaluate each preferred site within a geohydrologic setting and decide whether such site is suitable for the development of a repository under the qualifying condition of each applicable guideline.
5. Evaluate each preferred site within a geohydrologic setting and decide whether such site is suitable for site characterization under the qualifying condition of each applicable guideline.
6. Perform a reasonable comparative evaluation under each guideline of the sites proposed for nomination.

Because one site is selected in each geohydrologic setting that contains more than one site, it is not consistent with the siting guidelines to rank all nine potentially acceptable sites.

Issue

Some persons felt that the EAs did not adequately consider the religious attitudes of Indians about land.

Response

The DOE recognizes the need to identify and respect Indian values and is in the process of developing a programmatic memorandum of agreement with the Advisory Council on Historic Preservation. The agreement will ensure the consideration of Indian religious freedom under the American Indian Religious Freedom Act. In revising the EAs, Indian cultural values have been considered. The EA for the Hanford site notes that the Yakima Indian Nation has extensive historical and spiritual ties to the land on which the site is located.

Issue

Several commenters said that the draft EAs did not consider the impacts of site characterization on Indian Tribes, ceded lands, and treaty rights to off-reservation fishing.

Response

As explained in Chapter 4 of the EA for the Hanford site, the DOE believes that Indian Tribes will not be significantly affected by site characterization.

Issue

Commenters stated that discussion of the siting process for the first repository was deficient in the draft EA. Because siting decisions were made before the Act was passed and before the publication of the guidelines, the DOE should discuss the basis for these decisions in the draft EA.

Response

The siting decisions made before the publication of the guidelines were based on criteria similar to the guidelines. The bases for these decisions are discussed in detail in the documents cited in Chapter 1 of the EAs. A more detailed discussion of the process in Chapter 1 is therefore unnecessary.

Issue

Specific suggestions for improving the EAs included the addition of a glossary and a key-word index.

Response

A glossary was included in the draft EAs, as it is in the final EAs. However, because of the limited time available to prepare and revise these documents, it was not possible to add a key-word index.

Issue

A number of commenters suggested specific revisions to Chapter 1 of the draft EAs. Some of those suggestions were editorial; some were specific suggestions applicable to only one site. The suggested general changes can be summarized as follows:

1. Chapter 1 should describe how the DOE would substitute sites for those eliminated by characterization.
2. Chapter 1 should point out that the Act requires the DOE to issue the site-characterization plans for review by the States and the public as well as the NRC.
3. Chapter 1 should be revised to indicate that site characterization begins only after the completion and review of site-characterization plans and public hearings.
4. Chapter 1 should mention the right of an affected Indian Tribe to issue a notice of disapproval.

Response

In response to the first three comments, Chapter 1 was revised as appropriate.

In regard to comment 4, the Act allows an affected Indian Tribe to issue a notice of disapproval if a proposed site is located on its reservation (Section 118(a)). However, none of the potentially acceptable sites is located on any Indian reservation, and although the DOE welcomes their participation in the repository program as affected Indian Tribes, the Indian Tribes do not have the statutory authority to issue a notice of disapproval.

Issue

One commenter said that the EAs should include a detailed explanation of how the entire process is funded.

Response

The DOE's program for the management of civilian radioactive waste is funded from the Nuclear Waste Fund, which was established by Congress and consists of monies paid into the fund by the utilities that generate the radioactive waste. A more detailed explanation of the funding is given in the Mission Plan (DOE, 1985a).

Issue

One commenter felt that the EAs should include more information in Chapter 5 about the financial effects of site characterization and repository development on local communities and the grant programs applicable to individual sites.

Response

The socioeconomic impacts expected during site characterization are discussed in Section 4.2 of the EAs, which also explains what financial assistance would be available to the affected community.

The impacts expected during repository development are examined in Section 5.4.5 of the EAs; this section includes a discussion of the financial assistance that will be available. Information on financial assistance can also be found in the DOE's Mission Plan (DOE, 1985a, Vol. I, Part I, Chapter 4). (See also Sections C.2.1.2 and C.2.1.5.1 for comments and responses on the mitigation of fiscal and socioeconomic impacts.)

Issue

Some commenters said that more-detailed schedules are needed in the final EA.

Response

The EAs do not contain detailed schedules because the latter are given in the Mission Plan (DOE, 1985a) and the draft Project Decision Schedule (DOE, 1985b). The schedules of activities for site characterization will be presented in greater detail in the site-characterization plans. Plans and schedules for the environmental, socioeconomic, and transportation studies to be conducted concurrently with site characterization are also being prepared.

Issue

A commenter felt that the discussion of qualifying conditions in the EAs is given more prominence than the discussion of the disqualifying conditions.

Response

Disqualifying conditions describe conditions that are considered so adverse as to constitute sufficient evidence to conclude without further consideration that a site is disqualified; they were formulated to provide early evidence of the suitability of a site and hence require fewer data and less-complex analyses than do the qualifying conditions. They are discussed in both Chapter 2 and Chapter 6 of the EAs.

Issue

Some commenters asked that more information be included in the EAs about the program for public education and participation.

Response

The program for public information and participation is explained in detail in the DOE's Mission Plan (DOE, 1985a, Vol. I, Part I, Chapter 4). (See also Section C.2.1 for comments and responses on this topic.)

Issue

Commenters requested that the discussion of the guidelines in the EAs be clarified.

Response

The format, structure, purpose, and application of the guidelines in the EAs are discussed in Section 6.1. Additional information can be obtained from the "Supplementary Information" on the guidelines themselves (DOE, 1984c) or from the DOE's responses to comments on the proposed guidelines (DOE, 1983).

Issue

Commenters suggested that an appendix listing all EA authors and their qualifications should be added to the EAs.

Response

A list of contributors is not included in the EAs because a fair and comprehensive list would consist of hundreds of names. To prepare such a list of persons who contributed to the EAs would be a task requiring a great deal of time. The commenter can be assured, however, that the contributors to the EAs are qualified and experienced professionals, and many of them have earned distinction in their scientific discipline.

C.2.7.4 Inconsistencies in the environmental assessments

Inconsistencies in the EAs were the subject of many comments, which noted inconsistencies in the assumptions about the age of the spent fuel, the waste package, the exploratory shafts and the shafts for the repository, the descriptions of surface facilities, assumptions used in radiological assessments, the models and assumptions used in analyses of socioeconomic impacts, analyses of worker health and safety, and several other topics.

Issue

A number of commenters pointed out inconsistencies between the executive summaries and the corresponding chapters in the draft EAs.

Response

There were indeed some inconsistencies, resulting mainly from a failure to update the executive summaries after the last revision (one of several) of the draft EAs. In revising the final EAs, the executive summaries were corrected to reflect the corresponding chapters.

Issue

Some commenters pointed out that the draft EAs were inconsistent in their presentation of air-quality impacts. For example, the EA for the Deaf Smith site considers vehicle emissions and fugitive dust in evaluating the impacts

of repository operation, whereas the EA for Davis Canyon does not do so. The draft EAs were also said to be inconsistent in their treatment of regulations for the Prevention of Significant Deterioration (PSD).

Response

The air-quality evaluations for each site have been revised as a result of comments from the States, the public, and other Federal agencies; the results are presented in a format that is as consistent as possible. Some differences remain, however, because the evaluations must use available data, which can vary among the different sites, and because the air-quality regulations are implemented by different agencies for each site. The revised impact analyses have reconsidered air-quality models, inputs (e.g., vehicle emissions, fugitive dust), operating assumptions, and PSD applicability according to guidance from the appropriate regulatory agencies.

Issue

Many commenters said that the EAs need to provide a fuller and more realistic discussion of socioeconomic impacts and to expand the discussion of mitigation measures. They also need to address the positive socioeconomic impacts of a repository.

Response

Chapter 5 of the EAs addresses general provisions for financial and technical assistance to mitigate adverse socioeconomic impacts. Site-specific mitigation measures will be developed after the DOE has performed a detailed impact analysis and the affected State or Indian Tribe has submitted an impact report for the site recommended for repository development. (See also Sections C.2.1.2.4 and C.2.1.5 for comments and responses on this topic.)

The EAs also address some of the positive socioeconomic impacts of a repository, such as the potential for new local jobs, total project and local purchases, and likely sources of additional tax revenues. The final EA for the Hanford site also discusses the potential for greater use of the area's available human and physical resources.

Issue

Some commenters criticized the EAs for using different approaches and bases for the socioeconomic analyses--in particular, different labor-force estimates, different multipliers for the indirect employment expected to result from the repository, and different assumptions about the in-migration of repository workers. One comment objected that no adequate explanation was given in the EAs for the differences in the employment and in-migration estimates and stated that the population increase estimated in the EA for the Yucca Mountain site appears to be due to an "overly conservative analysis."

Response

It is true that the EA analyses for the different host rocks used different labor-force estimates, employment multipliers, and assumptions about in-migration. However, some of the differences to which the commenters object

are unavoidable because of differences in the design of the repository, the availability of data, and local conditions, which vary significantly among sites. Furthermore, the socioeconomic analyses were performed by several different groups of analysts, who used assumptions and multipliers they deemed most suitable for the socioeconomic conditions of the site and the available data.

The population increase estimated for the Yucca Mountain site did indeed differ greatly from that for the other sites, but a significant part of this difference was attributable to the larger work force required for a repository at Yucca Mountain. The work force estimated in the draft EA for Yucca Mountain was as much as three times the work force estimated for the other sites. In the final EA for Yucca Mountain, the work-force estimate is lower, and so is the population increase projected for southern Nevada. The employment multiplier, while higher than that for the other sites, is the most reasonable multiplier for southern Nevada and is based on published analyses of historical data on employment in southern Nevada. The assumption that all of the repository workers would in-migrate was recognized and identified as being conservative in Chapter 5 of the draft EA for Yucca Mountain. It was chosen because detailed information about labor skills was not available and because it allowed the DOE to estimate the worst-case impacts on community services.

For the Hanford site, the socioeconomic analysis presented two scenarios. A maximum population estimate was based on an assumption of 100 percent in-migration, and a more likely estimate assumed that 75 percent of the miners and 25 percent of all other workers would in-migrate. The employment multiplier used was only slightly lower than that for Yucca Mountain. Again, the 100 percent maximum estimate was used to present a conservative analysis that would demonstrate that even worst-case impacts would be insignificant in this area, which has an excess of housing and public services.

For the salt sites, the lack of local socioeconomic data for a project as large as a repository led to an approach based on data for the study area and the use of multipliers from the literature (energy developments in the western States and projects of the Tennessee Valley Authority). This approach produced a high and a low range of estimates for in-migration and the associated impacts. The case of high in-migration was selected as a realistic, though conservative, case and was used for the impact analysis. Unlike the Hanford and Yucca Mountain sites, an assumption of 100 percent in-migration for the salt sites would have been inappropriate considering the socioeconomic conditions of the study area. It would have produced unrealistic overestimates of population increases in the smaller communities near the sites.

Issue

One commenter noted that the draft EAs are inconsistent in their treatment of worker health and safety. In particular, the following inconsistencies were pointed out:

1. The EAs for Yucca Mountain and Hanford present estimates of expected worker injuries and fatalities during site characterization, while the EAs for Davis Canyon, Deaf Smith, and Richton present estimates of only injury and fatality rates.
2. The Yucca Mountain analysis uses 1982 statistics provided by the National Safety Council. The Hanford analysis is based on a 1980 DOE report, while the Davis Canyon, Deaf Smith, and Richton analyses used 1976-1979 statistics from the Mine Safety and Health Administration (MSHA).
3. The EA for the Hanford site discusses occupational safety and health in Chapter 5, including specific numbers of expected injuries and fatalities during mining and construction. The EAs for Davis Canyon, Deaf Smith, and Richton give only rates. The EA for Yucca Mountain has no such analyses in Chapter 5.
4. The EAs for Hanford and Yucca Mountain discuss occupational safety in Section 6.3.3.2. The other three EAs do not.
5. The EAs for Hanford, Davis Canyon, Deaf Smith, and Richton discuss the applicability of various Federal and State occupational safety and health regulations. The EA for Yucca Mountain does not.

Response

The draft EAs for Hanford, Yucca Mountain, and the salt sites used different sources for their safety analyses. Hanford cites DOE Order 5480.1A, Yucca Mountain cites the National Safety Council (NSC), while the salt-site analyses are based on injury experience reports from the MSHA. Nonetheless, the estimates of fatalities, accident rates, etc., are not inconsistent. There is a direct correlation between the various sources.

From 1930 through 1977, MSHA statistical measures for injuries in mining used a basis that was somewhat different from that for the other industries. However, beginning with calendar year 1978, the MSHA adopted measures for injury experience that compare closely with the measures used in the Office of Occupational Safety and Health Statistics, the Bureau of Labor Statistics, and the U.S. Department of Labor. Therefore, beginning with 1978 data, the mining industry can be compared on a standard basis with other U.S. industries.

The MSHA requires all mine owners to report all accidents to the district office on a prescribed form. Because of the modification in reporting and processing procedures that became effective January 1, 1978, injury rates as currently computed are not precisely comparable to those of the previous years. Fatality rates, however, in which the "incidence rate" (the term used after 1977) is one-fifth of the "frequency rate" (the term used before 1978) for otherwise similar grouping, remain comparable.

The statistical data in the MSHA reports cover the work experience of all personnel engaged in exploration, development, production, maintenance, repair, and construction work, including supervisory and technical personnel, and onsite office workers. These activities cover the entire spectrum of the exploratory-shaft activities and, as such, are a better tool for statistical

projections of probable exploratory-shaft injuries. As compared with the reported accidents in the MSHA report, the National Safety Council uses sampling techniques for projections of probable injury experience.

The NSC statistics show that in 1982 there were 600 fatalities for 1.1 million workers in the mineral-extraction industry (including quarries). This figure reduces to 0.05 per 200,000 man-hours and compares with 0.06, 0.04, and 0.3 in MSHA's reports for the years 1976, 1977, and 1978, respectively. Similarly, the NSC statistics show 3.1 nonfatal injuries with days lost, which compares with 3.87, 3.78, and 5.48 such injuries reported by the MSHA for the 3 years. The NSC projected 4.7 total injuries per 200,000 man-hours for 1982, which compares with 5.96, 5.73, and 8.81 total injuries for the 1976-1978 period.

The final EA for Yucca Mountain includes a discussion in Chapter 5 of occupational health and safety.

Issue

Some commenters stated that the analyses for all sites should be based on the assumption of 10-year-old spent fuel because this assumption is likely to be conservative and will provide a common basis for comparison.

Response

All analyses in Sections 6.4.1 and 6.4.2 of the final EAs are based on the emplacement of spent fuel that is 10 years old.

Issue

One commenter recommended that the assessments of preclosure radiological safety under normal conditions should be based on similar assumptions about failed fuel rods.

Response

The analyses presented in the final EAs are based on the conservative assumption that 0.5 percent of the fuel rods arriving at the site have failed.

Issue

Several parties commented that, in estimating waste-package failure, all EAs should assume that failure occurs when some portion of the container wall corrodes, not necessarily the entire thickness.

Response

The approach suggested by the commenters is used in the Hanford EA and in the EAs for all of the salt sites. The approach of the Yucca Mountain EA was to use a simple estimate that is based on expected conditions, taking into account that few data have yet been obtained for repository conditions at Yucca Mountain. Thus, although the estimates indicate a lifetime of 30,000 years, the value actually used is 3,000 years to provide a very conservative lower bound for container lifetime.

Issue

Some commenters complained that comparisons among the sites are difficult because the EA analyses are based on different container designs.

Response

The design of the container depends on the characteristics of the site. For example, one of the criteria for design is usually the peak rock temperature, which depends on both the thermal properties of the rock and the amount of heat generated by the waste in the container. Therefore, container sizes and designs are different for different rock types, and the assumption of a common canister size or design in the EAs would not facilitate valid comparisons among the sites. For this reason, the EAs were not changed to reflect a common canister size or design.

Issue

One commenter stated that variations in container-design criteria need to be explained or justified in the EAs.

Response

Each of the repository projects is developing waste-package designs to meet the NRC's requirement for a container lifetime of 300 to 1,000 years and a radionuclide-release rate of less than 10^{-5} per year.

Issue

Several commenters asserted that the analysis and findings in the draft EAs did not reflect sufficient conservatism, considering the lack of site-specific data on which to base site nomination and recommendation decisions.

Response

Where no site-specific data were available, the EAs used extrapolations of regional data or conservative assumptions, in accordance with the DOE siting guidelines. A conservative approach was taken in evaluating the site characteristics that are important to the performance of the repository.

Issue

One commenter noted that the draft EAs differ in the number and the size of shafts drilled for site characterization and repository operations and said that the DOE should explain the technical basis for these variations.

Response

The draft EAs for the Yucca Mountain and the salt sites presented analyses based on the sinking of only one exploratory shaft. At the time the draft EAs were published, the DOE had already decided to sink two shafts at each site, but there was no time to revise the analyses in the draft EAs. The

construction of a second shaft would not significantly increase the impacts of site characterization. The final EAs have been revised to account for two shafts at all sites.

The number of shafts required for the repository depends on the host rock; thus the numbers of shafts is different for a repository in basalt, salt, or tuff.

Issue

One commenter stated that the surface-facility descriptions for all of the EAs should be the same, or the variations should be explained.

Response

The surface facilities of a repository depend partly on site-specific conditions, such as the terrain, and partly on the host rock; the host rock determines the number and size of shafts, the layout of the underground repository, the ventilation requirements, and similar factors that affect the design and layout of some surface facilities. Thus the surface facilities vary for repositories in basalt, salt, and tuff.

C.2.8 MISCELLANEOUS

Many of the comments in the draft EAs covered various topics, many of which were not concerned with the nomination of sites or even repository siting in general. These comments have been divided into three categories: production of radioactive waste, alternatives to geologic disposal, and general technical issues.

C.2.8.1 Production of radioactive waste

Several commenters maintained that the production of nuclear energy should never have been begun without establishing a method for radioactive-waste disposal. Many commenters recommended that the production of nuclear energy and thereby the production of radioactive waste be stopped until a solution is found for the permanent disposal of radioactive waste.

Issue

Commenters expressed the opinion that the production of nuclear energy should not have been begun before the development of a method for the permanent disposal of the radioactive waste.

Response

The search for suitable methods of permanent disposal began early in the development of nuclear energy. By 1957, for example, the National Academy of Sciences had already recommended geologic disposal in salt formations. Furthermore, in the early days of nuclear-energy development, it was generally

assumed that spent fuel would be reprocessed after being discharged from the reactor. The spent-fuel rods were stored in water pools at the sites of the reactors pending the start of reprocessing, and until the U.S. moratorium on reprocessing was declared in 1976 (see Section C.2.5.3), there was little incentive to develop disposal methods for spent fuel.

Issue

Commenters requested a moratorium on the production of commercial radioactive wastes.

Response

The production of electricity by nuclear energy is important to the national economy. In 1984, nuclear energy provided about 14 percent of the U.S. domestic electricity (DOE, 1985i). Nuclear energy is able to provide economical electric power, independent of foreign energy sources, while allowing the conservation of fossil-fuel reserves for other critical applications; it can help meet the future energy needs of this country. A moratorium on nuclear-energy production would severely damage U.S. energy and economic security.

Furthermore, a moratorium on radioactive-waste production would not remove the need for a repository. A large inventory of spent fuel has been accumulating at reactor sites. According to recent estimates, over 12,000 metric tons of spent fuel currently require disposal and over 130,000 metric tons will require disposal by the year 2020 (DOE, 1984d).

C.2.8.2 Alternatives to geologic disposal

Many comments suggested methods of disposal other than geologic repositories. Other commenters expressed concern that the DOE has not adequately considered all feasible options for disposal, such as disposal in space or beneath the seabed.

Issue

Some commenters wanted to know whether the DOE has considered space as a safe and feasible method for radioactive-waste disposal.

Response

Before deciding on geologic repositories, the DOE evaluated many alternative waste-disposal concepts, including space disposal (DOE, 1980). The DOE, in conjunction with the National Aeronautics and Space Administration (NASA) and others, studied the space-disposal concept, but did not favorably consider launching radioactive wastes into the sun because of excessive fuel requirements. Disposal on the moon was also rejected as an alternative because it might interfere with future lunar exploration. NASA's favored concept was to place high-level waste into a solar orbit about halfway between the Earth and Venus. This concept would use space shuttles to place the packaged waste into the appropriate solar orbit.

While the volume and weight of high-level radioactive waste are relatively small when handled on Earth, the cost would be enormous to launch all of the wastes into space. A fundamental requirement for space disposal is to separate the waste into short-lived and long-lived portions. The short-lived waste that would decay to innocuous levels in hundreds of years would be managed on Earth. Only the long-lived waste, which must be isolated for thousands of years, would be disposed of extraterrestrially. Therefore, disposal in space would only reduce, not eliminate, the need for terrestrial waste management.

The results of these studies led the NASA and the DOE to conclude that further study of space disposal is not warranted at this time. The reason for this conclusion was the expected additional cost of space disposal without achieving a significant reduction in long-term risk in comparison with the risk of disposal in a geologic repository. The concept of space disposal will be reconsidered if, at some future time, the DOE's program for waste-disposal technology or space-technology developments by NASA warrant the need for further study.

Issue

The DOE should consider disposal in relatively thick, stable beds of sediments located in deep, quiet, and remote regions of oceans or disposal in volcanic trenches throughout the world.

Response

The DOE is sponsoring a subseabed-disposal project as part of a multinational effort through Fiscal Year 1986. The disposal of high-level waste in the oceans has never been practiced by the U.S. Government and was prohibited by the Marine Protection, Research, and Sanctuaries Act of 1972 and under the London Convention on the Prevention of Marine Pollution by Dumping Wastes and Other Matter. The uncertainties and issues to be resolved regarding subseabed disposal are significant, and efforts to resolve them are under way.

Issue

A number of comments requested the DOE to start over with a safe answer to the problem of radioactive-waste disposal. It was noted that the concept of geologic repositories was developed in the 1950s. Many comments suggested that the DOE should accept new technology as it becomes available, and some commenters said that research and development on alternative methods of disposal should continue.

Response

A number of methods for the disposal of high-level radioactive waste have been examined by the Federal Government during the past 10 years, including subseabed, deep-hole, ice-sheet, and outerspace disposal. Of these alternative technologies, only subseabed disposal is currently funded by the DOE. The remaining alternative concepts were found to have no obvious advantages over geologic disposal. The primary consideration in evaluating these alternative technologies was public health and safety. The state of

technology, the potential environmental impacts, and suitability for spent-fuel disposal have been studied for each of these methods and are discussed in the final environmental impact statement for the management of commercially generated radioactive waste (DOE, 1980).

C.2.8.3 General technical issues

A number of comments addressed technical issues that are not site specific. There were a large number of such issues, and they covered a broad range of subjects, including the accuracy and conservatism of the analyses used in the EAs, conditions at the repository site after closure, etc.

Issue

Some persons asked whether a large number of small disposal facilities would be safer.

Response

No clear reduction in risk would result from using a large number of smaller repositories. No net advantages would be realized in terms of monitoring the performance of the repositories. While there may be some reductions in costs of transportation, these would be greatly outweighed by the extra cost of finding and qualifying a larger number of repository sites and developing many repositories.

Issue

Several commenters felt that a burden is placed on future generations for the disposal of the wastes.

Response

Geologic disposal was chosen for high-level waste and spent fuel because it minimizes the potential burden on future generations. Once the repository is closed, there is no need for maintenance. The use of geologic formations as barriers to radionuclide migration helps to ensure that there will be no significant health burdens to future generations even if the waste containers are eventually breached.

Issue

Some commenters said that the DOE needs to consider how it will prevent human intrusion over the long term.

Response

The DOE feels that human intrusion can be prevented through prudent siting in locations that have few, if any, natural resources and through institutional management. Several years ago, the DOE convened a human-interference task force to determine whether reasonable means exist (or

could be developed) to reduce the likelihood of unintentional human intrusion into a repository. The task force concluded that a significant reduction in the likelihood of human intrusion could be achieved, for perhaps thousands of years into the future, if appropriate steps are taken to communicate the existence of the repository to future generations.

Issue

One person asked whether the conclusions in the EAs on compliance with the guidelines are supportable.

Response

At the steps of site nomination and recommendation, the requirement for disqualifying conditions is evidence that does not support a finding that the site is disqualified. Likewise, the qualifying conditions are deemed to be present if the evidence does not support a finding that the site is not likely to meet the qualifying condition. The DOE believes that the available data and analyses for each site indicated that no site has a disqualifying condition and that all sites are likely to meet all the qualifying conditions.

Issue

One commenter asked whether the DOE can guarantee that no new mutations will occur from the waste-emplacment practices.

Response

Absolute guarantees are hardly ever possible, but the DOE believes that new mutations are extremely unlikely because there is very little likelihood that radioactive materials from the repository will reach the human environment.

Issue

One person asked whether the hydrogeologic conditions will be known well enough to make predictions over 10,000 years or more.

Response

At the time of application for a license for the repository, which comes after thorough site characterization, the hydrogeologic environment at the site will be well known. Not only will nominal values be determined for the parameters needed to predict the migration of radionuclides from the repository but also the uncertainties in those values due to measurement uncertainties and nonhomogeneous rock properties will have been determined.

Issue

One party asked whether the DOE plans to close the site without subsequent monitoring or retrieval.

Response

The DOE currently plans to be able to begin retrieval for up to 50 years after the start of waste emplacement and to monitor the site for some period, not determined at present.

Issue

One commenter noted that canisters need to stay intact for 300 years but monitoring will be for 50 years.

Response

The monitoring referred to by the commenter apparently is the 50-year period of waste retrievability and plans to monitor selected individual waste containers until the repository is closed; the objective of monitoring individual containers is to confirm their performance. Monitoring the containers after repository closure would be very difficult and could compromise the performance of the repository as a whole.

Issue

Some persons asked about the measures that will be used to protect the integrity of the controlled area for long periods after closure.

Response

At present, placing some form of physical markers around the site is the most likely method for notifying future societies of the presence of a repository. In addition, records will be kept.

Issue

Hanford will be accepting 60 percent of the Nation's defense waste.

Response

Whatever site is chosen for the first repository, it will receive up to 10,000 metric tons uranium equivalent of defense high-level waste.

Issue

One commenter said that phased repository construction will circumvent the NRC's requirement to review and approve complete site construction before accepting any waste for disposal.

Response

The Act (Section 114(d)) states that "the Commission shall consider an application for construction authorization for all or part of a repository...." Therefore the Act does not prohibit authorization for phased construction. The DOE has discussed this concept with the Nuclear Regulatory Commission and has received no objections to the concept. The sequence of license applications is described in the Mission Plan (DOE, 1985a).

REFERENCES FOR SECTION C.2

- DOE (U.S. Department of Energy), 1980. Final Environmental Impact Statement-- Management of Commercially Generated Radioactive Waste, DOE/EIS-0046F, Washington, D.C.
- DOE (U.S. Department of Energy), 1983. Record of Responses to Public Comments on Proposed General Guidelines for Recommendation of Sites for Nuclear Waste Repositories, DOE/RW-0001, Washington, D.C.
- DOE (U.S. Department of Energy), 1984a. Mission Plan for the Civilian Radioactive Waste Management Program, draft, Washington, D.C.
- DOE (U.S. Department of Energy), 1984b. Identification of Sites Within the Palo Duro Basin: Volume 1, "Palo Duro Location A," DOE/CH-(1); Volume 2, "Palo Duro Location B," DOE/CH-(2); and Volume 3, "Responses to Comments," DOE/CH-(3), Washington, D.C.
- DOE (U.S. Department of Energy), 1984c. "General Guidelines for Recommendation of Sites for the Nuclear Waste Repositories," Title 10, Code of Federal Regulations, Part 960, Federal Register, Vol. 49, No. 236, p. 47714, December 6, 1984.
- DOE (U.S. Department of Energy), 1984d. Commercial Power 1984: Prospects for the United States and the Free World, DOE/EIA-0438(84), Energy Information Administration.
- DOE (U.S. Department of Energy), 1985a. Mission Plan for the Civilian Radioactive Waste Management Program, DOE/RW-0005, Washington, D.C.
- DOE (U.S. Department of Energy), 1985b. Draft Radioactive Waste Management System Project Decision Schedule, DOE/RW-0018, Washington, D.C.
- DOE (U.S. Department of Energy), 1985c. Nuclear Waste Fund Adequacy and Assessment, DOE/RW-0020, Washington, D.C.
- DOE (U.S. Department of Energy), 1985d. Analysis of the Total-System Life Cycle Cost for the Civilian Radioactive Waste Management Program: Executive Summary, DOE/RW-0025, Washington, D.C.
- DOE (U.S. Department of Energy), 1985e. Annual Report to Congress, DOE/RW-0004/1, Washington, D.C.
- DOE (U.S. Department of Energy), 1985f. Draft Transportation Institutional Plan, DOE/RW-0031, Washington, D.C.
- DOE (U.S. Department of Energy), 1985g. Announcement of site selection for an MRS facility, Federal Register, Vol. 50, No. 81, p. 16536.

- DOE (U.S. Department of Energy), 1985h. An Evaluation of Commercial Repository Capacity for the Defense High-Level Waste, DOE/DP-0020/1, Washington, D.C.
- DOE (U.S. Department of Energy), 1985i. U.S. DOE Monthly Review, May 1985.
- DOE (U.S. Department of Energy), 1985j. Transportation Business Plan, DOE/RW-0046.
- DOE (U.S. Department of Energy), 1986. Draft Area Recommendation Report for the Crystalline Repository Project, DOE/CH-15, Argonne, Ill.
- EPA (U.S. Environmental Protection Agency), 1985. "Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," Title 40, Code of Federal Regulations, Part 191, Federal Register, Vol. 50, No. 182, p. 38066, September 19, 1985.
- National Council on Radiation Protection and Measurements, 1974. Basic Radiation Protection Criteria, NCRP Report No. 39, second reprinting, Washington, D.C.
- NRC (U.S. Nuclear Regulatory Commission), 1980. Transportation of Radionuclides in Urban Environs: Draft Environmental Assessment, NUREG/CR-0743, Washington, D.C.
- NRC (U.S. Nuclear Regulatory Commission), 1983. "Disposal of High-Level Radioactive Wastes in Geologic Repositories," Title 10, Code of Federal Regulations, Part 60.
- Tobin, R. L., and Meshkov, N. K., 1985. Preliminary Assessment of Costs and Risks of Transporting Spent Fuel by Barge, Argonne National Laboratory, ANL/ER-TM-85-2, Argonne, Ill.

C.3 SITING PROCESS AND DECISIONS

This section addresses comments on the siting process and decisions. It covers issues related to site screening and the siting guidelines (Section C.3.1), the evaluation of sites against the disqualifying conditions of the guidelines (Section C.3.2), the grouping of sites into geohydrologic settings and the selection of the preferred site for each setting (Section C.3.3), and the nomination and recommendation of sites for characterization (Section C.3.4). The section on nomination and recommendation is concerned with general issues related to the DOE's approach in selecting the sites proposed for nomination and recommendation in the draft EAs and with issues related to the comparative evaluation and ranking of sites. It does not include issues related to the evaluations of individual sites; these issues are addressed in Sections C.5 through C.8. With a few exceptions, Section C.3 addresses comments on Chapters 1, 2, and 7 of the draft EAs.

C.3.1 SITING GUIDELINES AND SITE SCREENING

Addressed in this section are comments on the DOE's siting guidelines, published as 10 CFR Part 960 on December 6, 1984 (DOE, 1984), and comments on site-screening issues. The latter are divided into two parts: general site-screening issues (Section C.3.1.2) and issues specific to a particular host rock or site (Section C.3.1.3).

C.3.1.1 The siting guidelines

Most of the comments on the DOE's siting guidelines (10 CFR Part 960) addressed general issues like the development of the guidelines, the timing of their publication, and their adequacy. These are summarized and answered in Sections C.3.1.1.1, C.3.1.1.2, and C.3.1.1.3, respectively. Comments on specific guidelines are covered in Section C.3.1.1.4.

C.3.1.1.1 Development of the guidelines

The development of the guidelines drew comments and questions from several parties who were concerned about the derivation of the guidelines, the level of State involvement, and the content of the guidelines.

Issue

Several parties questioned the origin and the derivation of the guidelines.

Response

After the Act was passed, the DOE assembled a task force of program experts to prepare proposed guidelines. The task force began by considering the criteria used earlier in the National Waste Terminal Storage (NWTs)

Program, including program objectives, system-performance criteria, and site-performance criteria (DOE, 1981, 1982); other sets of criteria defined for geologic repositories by the National Academy of Sciences (NAS-NRS, 1978), the International Atomic Energy Agency (IAEA, 1977), and earlier programs in the United States (Brunton and McClain, 1977; DOE, 1980); advance information made available by the NRC (1980); and the requirements of the Act.

In the development of the proposed guidelines, great care was taken to make them compatible with the existing applicable regulations of the Environmental Protection Agency (EPA), published as 40 CFR Part 190 (EPA, 1977) and the Nuclear Regulatory Commission (NRC), published as 10 CFR Part 20 (NRC, 1960) and with the regulations that had been recently proposed by the NRC and the EPA concerning the disposal of high-level radioactive waste and spent nuclear fuel in geologic repositories. The NRC had by then nearly completed the pertinent technical criteria for geologic repositories, 40 CFR Part 60 (NRC, 1982), and the EPA had issued, for public comment, proposed environmental standards, 40 CFR Part 191 (EPA, 1982).

Several draft versions of the siting guidelines were released: the proposed guidelines of February 1983 and the alternative guidelines of May 1983, both of which were issued for review and comment by the States, affected Indian Tribes, and the public; the revised guidelines of August 1983, which served as a basis for additional consultation with States, Indian Tribes, and Federal agencies; and the revised guidelines of November 1983, which were sent to the NRC for concurrence. The NRC held several meetings on the guidelines at which the DOE, States, affected Indian Tribes, and Federal agencies presented comments.

The revisions that resulted from this comment and consultation process are discussed in the "Supplementary Information" for the guidelines (DOE, 1984, pp. 47714-47751) and in the comment-response document for the guidelines (DOE, 1983). After NRC concurrence, the guidelines were published in final form (December 1984), and many copies were distributed to States, Indian Tribes, and the public.

Issue

Some commenters asked about the level of State involvement in developing the guidelines.

Response

As explained in the "Supplementary Information" for the guidelines (DOE, 1984, pp. 47717-47720), the siting guidelines were developed after two formal public-comment periods and two rounds of consultation with the interested States, including both separate meetings with individual States and plenary sessions. The comments submitted by the States on the proposed guidelines of February 7, 1983, led to a division of the guidelines into postclosure and preclosure guidelines and to the addition of the implementation guidelines. Many other changes were made to the guidelines in response to comments from the States. In addition, the States and Indian Tribes had opportunities to provide comments to the NRC during the concurrence process.

Issue

One commenter asserted that the DOE intentionally slanted the content of the siting guidelines to favor the selection of a particular site.

Response

The guidelines were not prepared with the intent of selecting any particular site for the first repository. The purpose of the guidelines is to provide an objective framework for ensuring that potential repository sites meet the standards established for radioactive-waste disposal.

C.3.1.1.2 Time of publication

A number of comments addressed the timing of the publication of the siting guidelines, both in relationship to the site-screening process and the publication of the pertinent EPA and NRC regulations.

Issue

Several commenters inquired why the publication of the final siting guidelines was delayed.

Response

The DOE realized that it was important to get public and State input on the content of the guidelines. This was a time-consuming process, but the DOE thought that the additional time required for this review was warranted in light of the benefits received.

Issue

Several commenters questioned how the nine potentially acceptable sites for the first repository could be identified before the final siting guidelines were issued and argued that the guidelines should have been issued before the identification of potentially acceptable sites.

Response

When the Act mandated the preparation of the guidelines, the DOE had already identified nine sites as potentially acceptable for the first repository; the screening that led to them had been based on criteria defined by the National Academy of Sciences (NAS-NRC, 1978), the International Atomic Energy Agency (IAEA, 1977) and earlier programs in the United States (Brunton and McClain, 1977; DOE, 1980). The DOE believes that Congress did not intend this screening to be repeated on the basis of the new guidelines required in the Act. Section 116(a) of the Act requires that, within 90 days of its enactment, the DOE identify the States with potentially acceptable sites and, within 90 days after such identification, notify the States and affected Indian Tribes of the potentially acceptable sites within their jurisdictions. Such a notification would be impossible if Congress had intended a repetition

of the screening against the guidelines, which were to be issued within the first 180 days. The screening that led to the nine potentially acceptable sites did not use the guidelines per se, but it was based on the same principles. The guidelines have been and will be used in the remainder of the site-selection process for the first repository and for screening potential sites for the second repository.

Issue

Several commenters contended that the guidelines should not have been developed before the promulgation of the EPA standards and the NRC criteria for geologic disposal because the guidelines are based on compliance with the EPA standards and the NRC criteria.

Response

The Act did not allow the DOE to delay the guidelines until the publication of the NRC and the EPA regulations. It required the DOE to issue guidelines within 180 days of the enactment of the Act (i.e., in August 1983), whereas the NRC and the EPA were to issue their regulations by January 1, 1984, and January 7, 1984, respectively.

However, the guidelines were based on proposed EPA and NRC regulations. Their compatibility with the NRC's 10 CFR Part 60, which was published in final form on June 21, 1983 (NRC, 1983), has been verified by the NRC, which used absence of conflict with 10 CFR Part 60 as one of the criteria for its concurrence on the guidelines. Throughout the guideline-development process, the DOE was able to review the working drafts of the EPA's 40 CFR Part 191 to ensure absence of conflict. The final EPA rule, published on September 19, 1985 (EPA, 1985), is not in conflict with the guidelines. As explained in the "Supplementary Information" for the guidelines (DOE, 1984, p. 47721), in the event of any future conflict between the guidelines and either 10 CFR Part 60 or 40 CFR Part 191, these NRC and EPA regulations will supersede the guidelines and constitute the operative requirement in any application of the guidelines. The guidelines also contain provisions for their amendment to maintain compatibility with the NRC and the EPA regulations.

C.3.1.1.3 Adequacy of the siting guidelines

Many of the comments received on the guidelines addressed the adequacy of the guidelines. The issues raised ranged from doubts about the ability of the guidelines to protect public health and safety to suggestions for revising the guidelines.

Issue

A number of comments expressed doubt that the guidelines would protect public health and safety and the quality of the environment.

Response

The siting guidelines are based on compliance with the EPA standards for the geologic disposal of radioactive waste (40 CFR Part 191) and the NRC criteria for implementing the EPA standards (10 CFR Part 60). Protection of the health and safety of the public and the quality of the environment is the basic objective of both the EPA and the NRC regulations.

Issue

Several commenters requested that "proximity" be included as a factor in selecting and evaluating potential repository sites, and one commenter questioned why proximity to dedicated lands is not a disqualifying condition.

Response

Proximity is included as a factor in the preclosure guidelines on population density and distribution, offsite installations and operations, the environment and transportation. Proximity is also implicit in the third disqualifying condition on the environment, which is concerned with the previously designated resource-preservation use of National or State parks, forest lands, etc.

Issue

Some parties said that, because no sites have been disqualified, the validity of the guidelines is questionable.

Response

The nine potentially acceptable sites for the first repository were identified in a site-screening process that evaluated regions, areas, locations, and potential sites against various criteria that were based on the same principles as the siting guidelines. One of the objectives of this process was to eliminate sites that do not merit the investment necessary for detailed studies and site characterization. It is therefore not surprising that none of the sites identified as potentially acceptable have not been disqualified in evaluations against the guidelines.

Issue

The guidelines were criticized by some parties for failing to specify procedures for verifying findings.

Response

The guidelines are intended to provide the framework for a site-screening and site-selection process that can lead to the selection of suitable sites. They do not contain any procedures for the conduct of site screening, methods of data collection and analysis, etc. Such procedures will be included in other documents, such as the site-characterization plans. The plans for site characterization will be reviewed by the NRC and the affected State, and the information collected during site characterization will be reported to the NRC every 6 months. The final determination of the suitability of any site will be made by the NRC.

Issue

Some comments alleged that, because the guidelines may be challenged by litigation, the EA findings are tenuous.

Response

As explained in Section C.3.1.1.1, the siting guidelines were developed through a process of extensive consultation with the States and affected Indian Tribes and review by the public. As required by the Act, they received the concurrence of the NRC. The DOE is therefore confident that litigation challenges will not bring about any significant changes in the guidelines or require changes in the EA findings.

Issue

The DOE was advised that the controlled area and the accessible environment should be defined before site characterization begins.

Response

The DOE siting guidelines define the accessible environment as the atmosphere, the land surface, surface water, oceans, and the portion of the lithosphere that is outside the controlled area.

The definition of the controlled area is derived from the NRC's 10 CFR Part 60 (NRC, 1983); it establishes an area of no more than 10 kilometers (6 miles) around a repository that is to be identified by markers, records, and other possible institutional controls intended to exclude incompatible activities from the area. The EPA's final standard in 40 CFR Part 191 (EPA, 1985) establishes a more restrictive definition of controlled area: it limits the controlled area to 5 kilometers in any direction from the outer boundary of the original location of the waste in a repository. Furthermore, the controlled area is also limited to 100 square kilometers, which is approximately the area that would be extend for a distance of 3 kilometers from all sides of an underground repository in a typical configuration. The EPA definition thus substantially reduces the area of the lithosphere that would be contained if the controlled area and thus decreases the distance to accessible environment. The 5-kilometer distance was chosen to retain reasonable compatibility with the NRC's requirement that the pre-waste-emplacment time of ground-water travel to the accessible environment be at least 1,000 years.

Issue

The adequacy of the guidelines for the ranking of sites was questioned.

Response

As explained in the multiattribute utility analysis of nominated sites, the DOE developed a revised method for using the guidelines to rate the technical adequacy of sites. This method has been reviewed by the National Academy of Sciences and other peer reviewers.

Issue

Some parties suggested that the guidelines should establish procedures for determining the end point of site characterization.

Response

The end point of site characterization will be established by the site-characterization plans, which will describe in detail the tests to be performed, the data that are needed, and what the data will be used for. Each plan will be specific to a particular site and will be based on the data and analyses needed to resolve outstanding issues about the suitability of the site. Because the end of site characterization depends on site-specific conditions, it cannot be defined by general siting guidelines. As already mentioned, these plans will be reviewed by the NRC, the affected States and Indian Tribes, and the public through a formal hearing process. The data collected during site characterization will be reported to the NRC every 6 months in progress reports that will also discuss any needed changes in the plans for testing. After site characterization is completed, the NRC may request the DOE to collect more data for the confirmation of the results of site characterization.

Issue

One commenter suggested that the potential impact on system performance by discrete hydraulic features (joints, faults, fractures, and dissolution conduits) be incorporated into the DOE guidelines and the EAs.

Response

The impact on system performance of discrete hydraulic features is not included in the guidelines because the guidelines must be general enough to cover all types of host rock. The impacts of such features, if they are present, will be assessed during site characterization.

C.3.1.1.4 Comments on particular guidelines

Issue

The guideline concerning the 10,000-year travel time from the repository to the accessible environment is not appropriate for radioactive waste that will be subject to dispersive and diffusive mixing processes.

Response

A 10,000-year travel time to the accessible environment is a favorable condition in the postclosure guidelines on geohydrology; it was derived from the NRC's criteria in 10 CFR Part 60. The qualifying condition for geohydrology says that the present and expected setting of a site shall be compatible with waste isolation, taking into account the characteristics of, and the processes operating within, the geologic setting.

Issue

Ground-water modeling should be specified in the postclosure guideline on geohydrology (and the EAs) as a screening tool rather than as a predictive tool. Modeling results should not be substituted for "hard data" where inadequate data would make verification impossible.

Response

As already mentioned, the guidelines are not intended to specify procedures for data collection, data analysis, or performance assessment. Detailed information on the technical approach will be presented in the site-characterization plans.

Issue

Some commenters asked why the technical guideline on preclosure site ownership and control is assigned to the system guideline for preclosure radiological safety instead of ease and cost of construction, operation, and closure.

Response

The primary purpose of the preclosure guideline on site ownership and control is to ensure compliance with the NRC's requirement that the DOE obtain ownership as well as surface and subsurface rights to land and minerals within the controlled area of the repository (10 CFR 60.121). The objective of this requirement is to protect the general public from any radioactivity that might be released in the repository, and hence this guideline is concerned mainly with preclosure radiological safety. The system guideline on the ease and cost of repository siting, construction, operation, and closure, on the other hand, is concerned with the use of reasonably available technology and assurance that the cost of siting, constructing, operating, and closing a repository at a particular site is reasonable in comparison with the costs of other available and comparable siting options.

C.3.1.2 General site-screening issues

Summarized and addressed in this section are comments on several generic site-screening issues: the site-screening process, the importance of host-rock diversity, the selection of sites on the basis of land use, and the screening for sites in salt. In addition, this section includes comments on particular siting issues, such as proximity to a national park.

C.3.1.2.1 Use of ambiguous criteria and lack of uniformity

The site-screening process was criticized because it allegedly varied from site to site and because host rocks other than basalt, salt, and tuff were not considered.

Issue

One party alleged that Chapter 1 of the draft EAs reveals the site-screening process to be full of ambiguously defined criteria, arbitrary cutoffs, and site deferrals and said that the criteria used to eliminate sites were aimed at reaching an arbitrary number of sites, rather than eliminating inferior ones. Size was cited as one such arbitrary factor, particularly the 2,000-acre minimum that led to the elimination of three salt-dome sites.

Response

The criteria used in screening for potentially acceptable sites were based on waste-isolation requirements, natural processes and conditions that could affect isolation, engineering design requirements, and factors particular to the rock type under consideration (i.e., dome size is pertinent only to salt domes). The size criterion, for example, was derived from repository designs and NRC requirements. The three domes were eliminated because the 2,000-acre criterion was established during the time the salt domes were being screened.

Chapter 1 of the EAs only highlights the site-screening processes. For a complete description of the processes, the supporting references cited in Chapter 1 should be consulted.

Issue

The DOE was advised to begin the national screening process for the first repository again, implementing a uniform process for all sites.

Response

To begin another national screening process for the first repository would violate the requirements of the Act, which specifies that the potentially acceptable sites for the first repository be identified at the time the guidelines are issued—within 180 days of the enactment of the Act. The requirement for the identification of potentially acceptable sites was derived from the recognition by Congress that the DOE had been conducting screening studies for several years. As explained in the "Supplementary Information" for the guidelines (DOE, 1984), the screening processes were based on principles similar to the guidelines.

Issue

Several commenters questioned why granite, considered by countries like Sweden as the best rock for a radioactive-waste repository, or argillaceous rocks (shale) are not being considered for the first repository.

Response

Because basalt, salt, and tuff are suitable host rocks for waste isolation, screening in these rocks had identified promising sites, the cost of characterizing more than three sites for the first repository seemed unwarranted, and the Act required potentially acceptable sites to be

identified within 180 days, the DOE decided to reserve granite for the second repository. Thus, studies of granite, a crystalline rock, have not progressed as far as studies of other host rocks. Several years will be required to identify potentially acceptable sites in crystalline-rock formations and to collect for such sites as much information as is available for the basalt, salt, and tuff sites in order for all sites to be considered on a comparable basis.

Argillaceous rocks at the Nevada Test Site were considered for the first repository in the late 1970s. As explained in Chapter 2 of the EA for the Yucca Mountain site, general studies were made of low-permeability shale, and detailed studies were made of the argillite-rich Eleana Formation. However, because the argillite rock was judged to be too complex for characterization, further consideration was suspended.

C.3.1.2.2 Importance of host-rock diversity

The DOE was criticized by some commenters for using the diversity of host rocks as a requirement in the site-screening process. Conversely, other commenters wanted to know why screening for the first repository was limited to basalt, salt, and tuff.

Issue

There were objections to the importance assigned to host-rock diversity. The requirement for diversity automatically places the Hanford and the Nevada sites in the top five and makes it possible for technically superior sites to be overlooked in favor of sites in different settings. (See also Section C.3.3 for comments and responses on geohydrologic settings.)

Response

The need to recommend and characterize sites in different host rocks is well established in the NRC requirements (10 CFR Part 60) to characterize three sites in two host rocks, at least one of which is not salt; in the requirement of the Act that, to the extent practicable, the DOE recommend sites in different host rocks; and in Section 960.3-1-1 of the siting guidelines. The consideration of alternative host rocks is also implicit in the requirements of the National Environmental Policy Act (NEPA). The DOE is nominating a set of sites that meet both the NRC's technical criteria in 10 CFR Part 60 and requirements for a diversity of host rocks. Without diversity, the discovery of a generic flaw in some particular host rock during site characterization would lead to unacceptable delays in the siting process.

C.3.1.2.3 Selection of sites on the basis of land use

Many comments addressed the screening of sites on Federal lands and the identification of the Hanford site in Washington and the Yucca Mountain site in Nevada as potentially acceptable on this basis.

Issue

Commenters said that the Hanford and the Nevada sites were selected on the basis of Federal ownership rather than geologic superiority, whereas the Act requires that geologic conditions be the primary criteria.

Response

Geologic conditions are the primary criteria. However, the DOE used two approaches to screening for geologically suitable sites for the first repository. One approach began with the identification of salt as a potentially suitable host rock and proceeded with a screening process that narrowed the size of the land unit under consideration from regions to sites.

The other approach began with the evaluation of certain Federal lands that are dedicated to nuclear-energy operations to see which contain potentially suitable host rocks; it led to screening at Hanford and at the Nevada Test Site. This approach was endorsed by the Comptroller General of the United States (General Accounting Office, 1979) and by a resolution by the House of Representatives (1979). Although land use formed the initial basis for the screening of Federal lands, the subsequent progression to smaller land units was based on evaluations of geologic and hydrologic suitability, using criteria that are similar to the siting guidelines. Since the publication of the guidelines, the evaluations of these sites have been based on the guidelines. If the results of site characterization cause a site on Federal land to be disqualified because of geologic conditions, the site would be dropped from consideration regardless of land ownership.

Issue

Some commenters asked why the DOE did not investigate government-owned sites other than Nevada and Hanford and other sites already set aside for nuclear-energy activities.

Response

Other DOE-owned sites dedicated to nuclear-energy activities were considered. However, the geologic and hydrologic conditions at the other sites did not seem as favorable as those of the Hanford Site and the Nevada Test Site. In addition, preliminary investigations of the Hanford Site and the Nevada Test Site had been conducted for defense programs, and experienced staff were available to assist in repository-site investigations. Another reason for choosing the Hanford and the Nevada sites for site screening is their large geographic area, which increases opportunities for finding sites with favorable combinations of geologic and hydrologic characteristics. For example, the large size of the Nevada Test Site allowed preliminary investigations in nine different host rocks in saturated and unsaturated environments before it was shown that the unsaturated environment in tuff was preferred to other geologic environments at Nevada.

C.3.1.2.4 Screening for sites in salt

There were a number of comments on the screening of sites in salt. Some of them questioned the suitability of salt, in general, whereas others asked about particular regions or sites.

Issue

Some commenters said that the EAs should explain why salt is the best host rock or the relative advantage of salt domes and bedded salt. They said that salt seems to be a candidate because it is the most-studied host rock rather than the best host rock, and its suitability has been questioned.

Response

Salt was recommended as a potentially suitable host rock for waste disposal in 1955 by the National Academy of Sciences-National Research Council (NAS-NRC 1957), which made this recommendation after evaluating many options. This recommendation was reaffirmed in a subsequent report (NAS-NRC, 1970) and endorsed by the American Physical Society (1978).

The characteristics of salt that are favorable for waste isolation are discussed in Section 1.2.2 of the EAs. The features of salt beds and salt domes were described in Section 1.3.2.2 of the EAs and in the DOE's Mission Plan (DOE, 1985, Vol. I, Part I, Chapter 5). The DOE has never claimed that salt is the "best" host rock for waste isolation. All of the host rocks considered for repositories have both advantages and questions to be resolved.

Issue

One commenter wanted to know why the Salina Basin was deferred for further study even though it is closer to a larger number of reactors than other salt sites and its selection would alleviate the problem of transporting waste over long distances.

Response

The Salina region includes portions of Michigan, New York, Ohio, Pennsylvania, West Virginia, and Canada. Regional analyses had indicated that bedded salt potentially suitable for a geologic repository occurs in Michigan, northeastern Ohio, and a portion of northwestern New York. Plans for field investigations in Michigan were halted in 1977 because of the enactment of a State law (Public Act 113) barring the disposal of high-level radioactive wastes in the State. Regional studies of the Salina Basin based on the geologic literature and geologic data from public and private sources were completed in 1978. These studies identified study areas for field investigations in New York and Ohio, but no field work was carried out for the reasons explained below.

The studies of the Salina region were not specific or detailed enough to judge that any part of the region was suitable or unsuitable for a repository. They did reveal, however, unfavorable characteristics in several parts of the basin. Among the most important was the high population density

and the concentration of urban areas (more than 50,000 inhabitants) in Ohio and southern Michigan. Another was the abundance of natural resources, especially the oil and gas deposits in Ohio and throughout the Michigan Basin. When the State of Ohio objected to further studies, the DOE was in the process of examining its goals and objectives in the management of radioactive waste and had begun investigations of alternative host rocks (basalt and tuff). Evaluations of salt were restricted to the Permian Basin of Texas, the Paradox Basin in Utah, and the salt domes in the Gulf interior region of Louisiana and Mississippi.

Issue

The DOE needs to discuss why the first two sites selected in the salt-screening process--Lyons, Kansas, and the WIPP site--were rejected and are not even mentioned in the description of the siting process.

Response

The site at Lyons, Kansas (an already existing salt mine), was used by the Atomic Energy Commission (AEC) from 1965 to 1967 for a large-scale experiment with simulated waste and electrical heaters. The purpose of this experiment, called Project Salt Vault, was to observe the response of salt beds to heat. In June 1970, the Lyons site was selected as a potential location for a geologic repository; the selection, however, was conditional on the satisfactory resolution of site-specific issues under study. The concept and the location were conditionally endorsed in November 1970 by the waste committee of the National Academy of Sciences. A conceptual design for a repository was completed in 1971. In 1972, however, the Lyons site was judged to be unacceptable for technical reasons: there were previously undiscovered drill holes nearby, and some water used in nearby solution mines could not be accounted for. Accordingly, the AEC decided to abandon Lyons as a demonstration site and to search for sites elsewhere.

In 1974, field investigations for a site for the Waste Isolation Pilot Plant (WIPP) were begun in the northern part of the Delaware basin in New Mexico. Selected by the Oak Ridge National Laboratory, the site was on the Eddy-Lea County line, about 30 miles east of Carlsbad. However, drilling and geophysical investigations produced unexpected results showing that the geologic structure appeared to be unpredictable because of proximity to a major aquifer. The structure could have been delineated by more drilling, but extensive drilling would have been contrary to the principle of minimizing the number of holes drilled into the repository. That site was therefore given up, and a new survey for sites in the New Mexico portion of the Delaware basin was begun by the U.S. Geological Survey and the DOE's predecessor, the Energy Research and Development Administration. In 1975, these efforts led to the identification of a site in the Los Medanos area, about 25 miles east of Carlsbad. The Waste Isolation Pilot Plant now being constructed there has been designated (by Public Law 96-164) a research-and-development facility for the national defense effort (to demonstrate the disposal of high-level waste) and for the disposal of defense transuranic waste. This plant is not part of the DOE's program for the management of commercial radioactive waste.

C.3.1.2.5 Particular siting issues

A number of comments addressed particular siting issues, such as proximity to a national park or the potential for contaminating water supplies.

Issue

The DOE was urged not to consider a repository site near a national park.

Response

The DOE recognizes its responsibility to protect the national parks from irreconcilable conflicts. According to the siting guideline on environmental quality, if the "presence of the restricted area or the repository support facilities would conflict irreconcilably with the previously designated resource-preservation use of a component of the National Park System," the site would be disqualified.

Issue

Some persons were concerned that a repository would contaminate water supplies and nearby rivers, thus adversely affecting the water supply of downriver populations.

Response

Water supplies and nearby rivers are protected by EPA and NRC regulations, which require complete containment of all radioactive material for 1,000 years and limit any releases thereafter to extremely low rates that would pose no hazard to public health or safety. Requirements for ground-water protection are explicitly included in the EPA's final standards (EPA, 1985).

Issue

Several comments said that a repository should not be located near prime farmland.

Response

The siting guidelines provide a number of opportunities to evaluate the potential impacts of a repository site on prime agricultural lands. For example, the preclosure guideline on socioeconomics says that the "potential for major disruptions of primary sectors of the economy of the affected area" is a potentially adverse condition. The DOE is concerned about impacts on prime agricultural lands and will not select any site that would irreconcilably damage farm capability.

Issue

Many commenters wanted to know why the DOE is continuing to consider the Hanford site. They claim that the highly fractured basalt rock has been shown to be a poor host rock for a repository.

Response

The Hanford site and the basalt host rock have many favorable characteristics for waste isolation and some questionable characteristics, just as the other rock types have. The DOE recognizes that the hydrologic conditions of the Hanford site are an important issue, but the results of studies conducted since 1976 have not revealed any technical reasons for finding the site unacceptable. If Hanford is selected for site characterization, the studies performed will provide the information needed for determining compliance with the siting guidelines and hence NRC criteria and EPA standards.

C.3.1.2.6 Alternative repository locations

Issue

Many commenters suggested alternative repository locations with particular characteristics (e.g., location away from populated areas, in an arid desert, or on barren government-owned land) or recommended specific sites.

Response

The characteristics suggested by the commenters are considered favorable conditions in the siting guidelines. However, the geologic conditions that are important to waste containment and isolation after repository closure are the primary considerations. No single site characteristic is sufficient because each site must meet the qualifying conditions of every guideline. While other possible repository locations may possess particular characteristics that are favorable, the DOE is confident that the sites being considered for the first and the second repository possess the combination of characteristics needed for compliance with the DOE siting guidelines and with the regulations promulgated by the EPA and the NRC for the protection of public health and safety.

C.3.1.3 Site-specific site screening issues

Comments concerning site-specific and site-screening issues were divided into three categories: (1) screening for the Yucca Mountain site, (2) comparative evaluation of sites, and (3) issues related to the executive summary.

C.3.1.3.1. Screening for the Yucca Mountain site

The comments on screening were divided into seven issues: (1) the screening process, (2) site conditions, (3) data and documentation for the screening process, (4) the adequacy of data base, (5) requests for clarification, (6) land ownership by the Western Shoshone Tribe, and (7) miscellaneous.

Issue

Nine commenters questioned the screening process, particularly the relationship between the early screening process that resulted in Yucca Mountain being considered and the later decision to choose the unsaturated zone. The EA was interpreted as saying that nine rock types were considered in the early site screening instead of the three actually used. The policy that led to the selection of Yucca Mountain (outside the Nevada Test Site) was also questioned on the grounds that the screening was restricted to areas within the boundaries of the Nevada Test Site. Also questioned was the applicability of the early judgments about the attractive attributes of Yucca Mountain in light of data obtained later in the screening process. Other commenters expressed concern that the site was chosen more for political and policy reasons than for ability to isolate the waste, and one of them asked whether all potential sites in Nevada had been considered as implied.

Response

The comprehensive documentation of the technical basis for the assumptions and data used in the screening study provides adequate support for an unbiased set of conclusions. As already mentioned, geologic and hydrologic conditions were the primary reasons for selecting Yucca Mountain within the area considered by the Nevada Nuclear Waste Storage Investigations (NNWSI) Project. The earlier investigation of the Nevada Test Site were begun, it is true, because the site was on Federal lands dedicated to nuclear activities, but even then geologic criteria were primary. The final EA has been changed to remove the unintended implication that all sites in Nevada were considered.

The unsaturated zone was selected as a target emplacement environment after the decision to focus exploration on Yucca Mountain. The formal screening study considered saturated and unsaturated environments throughout the screening area, not just at Yucca Mountain, as shown in Figure 2-11b of the draft EA. The unsaturated Topopah Spring Unit was one of the most favorably rated and subsequently, during the host-rock selection process (Section 2.2.5 of the draft EA), became the preferred option at Yucca Mountain. To date, no flaws have been discovered that would make the saturated zone at Yucca Mountain an unacceptable alternative.

As explained in the EA, nine rock types were considered in the formal screening study (Sinnock and Fernandez, 1982) that followed the earlier, less formal exploration activities, which considered only granite, argillite, and tuff (Sinnock et al., 1984).

Part of Yucca Mountain is indeed outside the boundaries of the Nevada Test Site; however, this is not incompatible with the siting policy of the formal screening area shown in Figure 2-8 (map of the area on and adjacent to the Nevada Test Site within which screening for repository locations was conducted) of the draft EA was designated by the DOE in July 1981.

The attributes listed in Section 2.2.1 of the draft EA are general characteristics of the Nevada Test Site region and are not intended to imply that all sites in the region possess all the characteristics. These characteristics were the initial reasons for believing that potential sites might exist near the Nevada Test Site.

Issue

One commenter stated that the draft EA incorrectly implied that in deep water table was the primary reason for the start of investigations at Yucca Mountain.

Response

The identification of Yucca Mountain as a potentially acceptable site is described in Section 2.2 of the EA. The paragraph referred to in the comment was not meant to imply that the site was selected because of ground-water conditions in the Yucca Mountain area.

Issue

One commenter erroneously stated that "bedded tuffs" contain numerous cooling cracks that "store and transmit" water.

Response

Bedded tuffs actually tend to be nonfractured because these are relatively nonbrittle. Their fracture frequencies are much lower than those of welded tuffs; matrix transport is the dominant flow mechanism.

Issue

Several commenters asked that more information, data, or documentation be supplied on (1) the surfacemapping methods used to indicate areas large enough for a repository, (2) the endorsement by the National Academy of Sciences (NAS) of the continued study of tuff, (3) the recommendation by the U.S. Geological Survey (USGS) of Yucca Mountain as a potential repository, and (4) how the rating system used in the formal screening process accounted for three-dimensional differences among the alternative locations. One of these commenters also asked why drilling outside the Nevada Test Site was begun in 1978 before the NAS endorsement.

Response

The preliminary surface mapping referred to in Section 2.2.3 of the draft EA was published by the USGS as geological quadrangle maps (Christiansen and Lipman, 1965; Lipman and McKay, 1965). Standard mapping techniques (field observations augmented by aerial photographs, sample collection and testing, and topographic contour interpretation) were used to prepare the maps.

A letter from E. F. Gloyna of the NAS National Research Council to S. Meyers of the DOE, dated April 23, 1979 contains the qualified endorsement of the National Academy of Sciences Committee on Radioactive Waste Management to continue the investigation of tuff as a potential host rock for a repository in Nevada, confirming a preliminary oral endorsement given at the close of a meeting held on September 20, 1978, in Washington, D.C. Reference to this letter has been added to Section 2.2.4 of the final EA.

The USGS recommendation to focus exploration at Yucca Mountain is contained in a letter from W. S. Twenhofel of the USGS to R. M. Nelson of the DOE, dated April 24, 1979. This reference has been added to Section 2.2.3 of the final EA.

Three-dimensional variations in physical attributes were accounted for in the formal rating system by geographic maps (horizontal variations) and host-rock properties (vertical variations) (Sinnock et al., 1984). In combination, these maps and properties provided preliminary three-dimensional information for evaluation.

The exploratory drilling in 1978 was conducted within the boundaries of the Nevada Test Site, as shown in Figure 6-2 of the draft EA.

Issue

Some commenters said that the data presented in the draft EA were not sufficient to state with confidence that Yucca Mountain is suitable for a repository. On the other hand, two other parties suggested that the DOE be more positive about the EA data and emphasize the appropriateness of the data.

Response

The purpose of the EA is to present available information about the site as a basis for nominating five sites for the more-detailed investigations conducted during site characterization in accordance with the Act. The data necessary to determine the suitability of three sites for the first repository will be collected during site characterization. According to the Act and the siting guidelines, the data base for the EAs is to consist only of currently available information. The document is the best available assessment of what is known at this time, but because the data are incomplete, it is necessary and appropriate to tell the readers about the uncertainty associated with the assessment.

Issue

One commenter stated that the draft EA did not adequately address the institutional process associated with Federal; and State jurisdiction and control of the land and water resources needed for the repository.

Federal and State institutional processes are addressed separately in subject-specific sections (see Sections C.4.1.2.3, C.4.1.3.1, C.4.1.3.6, C.7.2.1, C.7.2.6, and C.7.4).

Issue

One commenter said that all site-characterization studies should be completed before the environmental impact statement (EIS) is prepared.

Response

The site-characterization program, as defined in the site-characterization plan to be prepared for each candidate site, will indeed be completed before the EIS is issued. It will end when sufficient data have been gathered to

support site selection on the basis of the siting guidelines. After the EIS is issued, however, the DOE may continue in-situ testing in the exploratory-shift facilities to confirm the data collected earlier.

Issue

One commenter objected that the DOE prejudged environmental consequences in Section 2.3 of the draft EA, which stated that no adverse environmental impact have been identified in the area that would be effected a repository at Yucca Mountain and no such impacts are expected.

Response

Section 2.3 of the EA present an evaluation of the Yucca Mountain site against the disqualifying conditions of the guidelines. The evaluation of the site against the disqualifying condition for the preclosure guideline on environmental quality says that the evidence collected to date indicates that the siting, construction, operation, closure, and decommissioning of a repository at Yucca Mountain would not result in any unacceptable adverse environmental impacts that would threaten the quality of the environment. Section 2.3 does recognize that some impacts are to be expected and lists them. More-detailed discussions of the expected impacts are presented in Chapters 4 and 5. If the Yucca Mountain site is recommended and approved for site characterization, the DOE will collect the environmental data necessary to demonstrate compliance with the qualifying condition of the guideline on environmental guideline.

Issue

A number of commenters provided suggestions for clarifying the text or increasing the preciseness of measurements presented in metric units. One commenter questioned the accuracy of a statement attributed to Snyder and Oliver (1981), while another questioned a reference to the amount of land being withdrawn. One commenter stated that the draft EA reflected the idea that Nevada was part of the geologic "crystalline shield."

Response

All of the comments suggesting revisions for classification were carefully considered and, where appropriate, the EA was revised accordingly.

The statement attributed in Section 2.2.3 of the draft EA to Snyder and Oliver (1981) was corrected in the final EA.

The comments regarding metric measurements were accepted. Section 2.2.3 was revised to correct the imprecise numbers, and the discussion of the first exploratory hole was modified to state the exact depth instead of giving an approximate depth.

The draft EA erroneously stated that it may be necessary to withdraw 50,000 acres of Bureau of Land Management (BLM) land. The actual number is approximately 5,000 acres. Most of the proposed repository surface facilities would be located on Nevada Test Site property while most of the underground portion would extend into BLM land.

The discussion in the EA reports that the oldest rocks anywhere in the Basin (the comment about the crystalline shielded is due to a misinterpretation of the text) and Range Province are in cores of mountains and that, if present, the crystalline "basement" complex is part of the "shield."

Issue

A number of commenters stated that the Yucca Mountain site is currently owned by the Western Shoshone Tribe and that the nomination of the site should be withdrawn until the Federal Government can claim absolute ownership.

Response

The U.S. Government views considers that the land now comprising the Yucca Mountain site is federally owned and not subject to any Indian title or right. This position was recently reinforced by the U.S. Supreme Court in its decision in *United States vs. Dann* (February 20, 1985). In this case, the Supreme Court held that the Western Shoshone Tribe had already received payment in satisfaction of its claim that its ancestral territory, a portion of which included Yucca Mountain, had been taken.

Issue

A commenter asked whether there are any toxic chemical wastes in the proposed repository area and requested information on the actions that would be taken if toxic waste infiltrated into the repository.

Response

No chemical toxic wastes are stored at or near the Yucca Mountain site. Low-level radioactive wastes are at a site south of Beatty, Nevada, which is approximately 20 miles west of Yucca Mountain. Therefore, no chemical wastes are expected to reach the repository infiltration.

C.3.1.3.2 Comparative evaluation of sites

The comments that were received on the discussion in Chapter 7 of the EA were divided into the following issues: (1) geohydrology and climatic changes; (2) geochemistry; (3) tectonics; (4) human interference; (5) preclosure radiological safety; (6) environment, socioeconomics, and transportation; and (7) ease and cost of siting, construction, operation, and closure.

Issue

Four commenters addressed the comparison of the sites against the geohydrology guideline, pointing out that the data base available for the unsaturated zone at Yucca Mountain is inadequate and suggesting that uncertainties are too great to allow conclusions on most of the favorable and potentially adverse conditions. A fifth commenter pointed out the uncertainty in predictions of future climatic conditions.

Response

If the Yucca Mountain site is recommended and approved for characterization, the DOE will gather additional information on the unsaturated zone at Yucca Mountain. The additional data will be used to reevaluate the findings reached on the qualifying and disqualifying conditions of the guidelines to support the selection of the site for the first repository. To compensate for the uncertainty in predictions of future climatic conditions, both expected and unexpected conditions will be examined in conservative analysis of potential effects on waste isolation.

Issue

Three commenters suggested that the behavior of zeolites and clays under thermal conditions (as well as other heat-induced alterations of tuffs) could adversely affect the isolation capability of the site.

Response

Section C.5.2 of this document provides a thorough discussion of the thermal stability of clays and zeolites; it indicates that most zeolites are located outside zones that will experience significant temperature increases. The potential host rock is welded and devitrified and is unlikely to undergo significant heat-induced alteration.

Issue

Ten commenters addressed various concerns about postclosure tectonics at the Yucca Mountain site. The favorable condition for absence of volcanic activity was challenged on the basis of inadequate knowledge of the cyclic nature of igneous and seismic activity. The absence of faulting younger than 40,000 years near Yucca Mountain was challenged, as was the adequacy of the seismic record. One commenter challenged the conclusion that Yucca Mountain is not likely to experience more or larger earthquakes than the region. Several commenters challenged the fifth potentially adverse condition by suggesting that volcanic activity could cause disruption of the ground-water flow system. One commenter noted that regional tilting was not considered by reliance on leveling surveys; a commenter pointed out that tilting could influence hydraulic gradients. A final commenter claimed that the data base is inadequate to support the finding that the site meets the qualifying condition.

Response

Long-term trends in tectonic activity in the western United States and the Basin and Range are relatively well understood. The confidence placed on predictions of future igneous and seismic activity is based on an understanding of the processes involved. The claim that faulting younger than 40,000 years may have occurred near the site is entirely consistent with the wording in Swadley et al. (1983) which states that "younger movement cannot be ruled out." During the postclosure period, earthquakes and fault movement alone are unlikely to cause loss of containment or isolation (see discussion on tectonics disqualifier, Section 6.3.1.7.5 of the EA). There are no indications that the Yucca Mountain site is likely to have larger or more-frequent earthquakes than those that occur in the southern Basin and Range setting.

In a hydrologic system that is dominated by fracture flow, it is unlikely that new faults will cause major changes in flow-system characteristics. Slow regional tilting could alter gradients, but the time periods are such that isolation is not likely to be affected. More information on tilting and warping with rates and directions will become available if site characterization studies are conducted at Yucca Mountain.

Issue

Two comments addressed the exploitation of ground-water resources and its effect on waste isolation.

Response

Ground water at Yucca Mountain is more than 1,500 feet below the surface. Because shallower water sources are available to the west, south, and east, it is unlikely that water would be extracted from directly beneath the site. In addition, the principal contribution to isolation at Yucca Mountain is the thick unsaturated zone, which will prevent radionuclides from reaching the water table for more than 10,000 years (Section 6.4.2 of the EA). For this reason, resource recovery outside the controlled area is highly unlikely to affect the isolation potential of the site.

Issue

Several commenters asked for an explanation of the basis for a statement that energy defense activities taking place in proximity to the Yucca Mountain site are not expected to conflict with repository activities, particularly in regard to radiological safety.

Response

"Conflict with repository activities" pertains to land rights rather than radiological safety. (Land use is discussed under Section 5.2.3 of the EA, and comments about land use are discussed in Sections C.4.1.3.1 and C.7.2.1 of this document.) With specific regard to radiological safety, analyses of construction and maintenance records show that underground tests have had little or no effect on tunnels, and therefore the construction and operation of the repository are not expected to be affected by activities at the Nevada Test Site (NTS), nor are NTS activities expected to result in radiological releases (see Section C.6.4).

Issue

Two commenters felt that discussion of socioeconomic impacts should have been more detailed.

Response

The DOE believes that the discussion is adequate for the purpose of the EA and that the analyses and conclusions are valid and justifiable.

Issue

Four commenters questioned the evaluation of the site against preclosure guidelines for surface characteristics, rock characteristics, hydrology, and tectonics. They were concerned with the permissibility of considering potential for sheet wash; the nature and extent of the potential host rock, and the reason for using rock bolts; and the favorable and potentially adverse conditions for tectonics.

Response

The potential for sheet wash is present at almost all sites in the western United States. In the final EA the DOE has revised the appropriate guideline findings to reflect this condition in surface characteristics (Section 6.3.3.1) and hydrology (Section 6.3.3.3). The areas of potentially suitable rock that could be considered for the lateral expansion of the repository are shown in Figure 6-5 of the EA and are discussed in Section 6.3.3.2.3. Rock bolts are routinely required in underground facilities to ensure worker safety and efficiency. The evaluations of preclosure tectonic conditions have been substantially improved in the final EA, with better support for the conclusions.

C.3.1.3.3 Issues related to the executive summary concerns

Several comments noted inconsistencies between the text of the EA and the executive summary. One commenter stated that the unsaturated zone should not be characterized as dry because of the presence of vadose water. The vertical and lateral extent of the potential host rock was questioned, as was the nomenclature for the types of rocks in the region. One commenter questioned why guideline statements were not identical with those in 10 CFR Part 960. Several commenters stated that guideline summary statements were based on incorrect assumptions in Chapter 6 with regard to seismicity, climatic stability, infiltration, location of zeolite minerals, mineral resource estimates, the water content of the host rock, and estimates of travel times to the accessible environment.

Inconsistencies were also pointed out in the discussions of archaeology, site location and land use (particularly with regard to the Nevada Test Site), socioeconomic effects, transportation, radiological safety, and emergency preparedness.

Response

Many of the concerns expressed in the above comments were addressed by revisions to the executive summary in the final EA. The unsaturated zone should not be referred to as dry, because the moisture content is variable, with an average saturation of 60 percent. Errors in the descriptions of the major rock types in the region surrounding Yucca Mountain were corrected. The comment about the guidelines apparently referred to the "supplementary information" for the guidelines rather than the explanatory material that was included in the text of guidelines themselves.

For responses to the comments regarding incorrect assumptions in Chapter 6 of the EA, the reader should see the following sections in this comment response document: seismicity in C.5.7, climatic stability in C.5.4, infiltration, water content of host rock, and travel-time estimates in C.5.1, location of zeolite minerals in C.5.2, transportation in C.4.1.4 and C.7.3, socioeconomics in C.4.1.5 and C.7.4, and radiation in C.7.2.7.

In answer to questions about the location of the repository facilities, most of the underground repository would be outside the boundaries of the Nevada Test Site, but some surface facilities would be built on land belonging to the Nevada Test Site.

C.3.2 EVALUATION OF DISQUALIFYING CONDITIONS

No comments in the evaluation of the Yucca Mountain site against the disqualifying condition of the guideline, as summarized in Section 2.3 of the EA, were received.

C.3.3 DIVERSITY OF GEOHYDROLOGIC SETTINGS AND THE SELECTION OF PREFERRED SITES

The DOE's emphasis on a diversity of geohydrologic settings and the selection of the preferred site in each setting were the topics of many comments. The issues raised included objections to the grouping of sites into geohydrologic settings, requests for detailed explanations of the selection of preferred sites, and doubts about the availability of sufficient information to discriminate between sites in a geohydrologic setting.

Issue

There were objections that the requirement for grouping sites into geohydrologic settings and selecting one preferred site from each setting artificially elevates the importance of host-rock diversity over geologic conditions. It automatically places the Hanford and the Nevada sites in the top five and makes it possible for technically superior sites to be overlooked in favor of sites in different settings.

Response

It is indeed true that the second-best site in one geohydrologic setting may be in some respects superior to the best site in another geohydrologic setting. However, it is not necessary to find the absolutely best site for the repository; a research for the absolutely best site could be almost endless. It is necessary to find and qualify good sites—ones that meet or exceed all of the technical requirements that bear on protecting public health and safety during repository operations and over the long term. In order to find satisfactory sites in a reasonably expeditious manner, and to satisfy the requirement of the Act that sites from different host rocks be recommended, the DOE has chosen to emphasize diversity of geohydrologic settings in the process of selecting sites for nomination and recommendation. Maintaining a

diversity of rock types has the added advantage of minimizing the possibility of a program delay that could be caused by an as-yet-unrecognized basic flaw in a particular host rock.

The fact that the emphasis on geohydrologic diversity automatically places the Hanford and the Nevada (Yucca Mountain) sites in the top five is an artifact of the processes that led to the nine potentially acceptable sites. The searches that yielded the nine potentially acceptable sites were not necessarily identical. Those that took place on DOE-controlled land, ending with the selection of the Hanford and the Yucca Mountain sites, were directed at choosing a single site on Federal land dedicated to nuclear activities. For example, 9 rock types in 15 alternative locations were considered in the site-screening process for the Yucca Mountain site. The site-screening process for the salt sites had not yet narrowed the candidates down to a single site per geohydrologic setting at the time the nine potentially acceptable sites were identified.

Issue

Several commenters recommended that the final EA should state more clearly the importance to site selection of establishing candidates in a variety of geohydrologic settings and that the selection of the preferred site in each geohydrologic setting should be explained in detail, with reference to the siting guidelines.

Response

The importance of maintaining diversity in geohydrologic settings in the siting process is explained in the preceding response.

Section 2.4 of the EAs for the salt sites describes how the preferred site in each geohydrologic setting was chosen, with reference to the siting guidelines.

Issue

Some parties wanted to know why only one tuff and one basalt site were considered as compared to seven salt sites. The Nevada and the Hanford sites were compared with no others in the same geohydrologic setting or in the same host rock.

Response

Because the studies of the Nevada (tuff) and the Hanford (basalt) sites were started on the basis of favorable land use (Federal ownership and dedication to nuclear activities), they were focused on locating a geologically suitable site on a particular Federal reservation. The DOE did not need to progress through regional, area, and location studies--the process that identifies alternative sites at each major screening step.

Issue

Some commenters did not believe that the DOE had sufficient information to discriminate between sites in a geohydrologic setting (between Davis Canyon and Lavender Canyon; among Richton, Cypress Creek, and Vacherie Domes; and between Deaf Smith County and Swisher County).

Response

The basis for selecting the preferred site in a geohydrologic setting is discussed in Section 2.4 of each EA. It is the DOE's position that the information currently available on the different sites is adequate for choosing a preferred site in each setting.

C.3.4 NOMINATION AND RECOMMENDATION OF SITES FOR CHARACTERIZATION

In Chapter 7 of the draft EAs, each of the five sites proposed for nomination (Davis Canyon, Deaf Smith, Hanford, Richton Dome, and Yucca Mountain) was assigned a ranking for each technical guideline. Three quantitative methods were then used to aggregate these rankings. Two of the methods were criticized by the commenters for lacking firm theoretical foundations. The third method—described variously as the utility-estimation, rating, or weighting-summation method—was criticized because its application did not follow the procedures suggested by the professional literature. The methods were briefly described in Section 7.4 of the draft EAs, which also presented the results of their application—the identification of three sites as preferred for nomination. A more detailed discussion of the three methods was given in Appendix B.

In response to these comments, the DOE undertook a more formal application of the utility-estimation method (referred to as the decision-aiding methodology) to provide a more defensible overall comparative evaluation as a basis for determining which three sites appear most favorable for recommendation for characterization. The decision-aiding methodology is intended to provide a framework for systematically accounting for the technical and value judgments required in selecting sites for recommendation. It has been reviewed by the Committee on Waste Management of the National Academy of Sciences.

The various steps of the analysis were conducted by a DOE team consisting of experts in decision analysis, the technical disciplines corresponding to the technical siting guidelines, and repository performance. The technical information for the analysis was obtained from the final EAs. The value judgments were provided by DOE management and staff. A detailed explanation of the decision-aiding methodology, the analyses that were performed, and the results are presented in the multiattribute utility analysis of nominated sites and the recommendation of candidate sites, which are being issued separately.

The rankings reported in Chapter 7 of the draft EAs elicited numerous comments, some of which objected to the rankings assigned for a particular guideline and some of which suggested different rankings. A number of comments were also directed at the methodology used in aggregating the rankings, at the weighting used for the postclosure and the preclosure guidelines, and at the choice of preferred sites.

In the final EAs, Chapter 7 presents only a comparative evaluation of the nominated sites that does not rank the sites on individual guidelines and does not aggregate rankings to identify preferred sites for recommendation. The ranking is performed in the multiattribute utility analysis of the nominated sites. For this reason and because the process of identifying the most favorable sites for recommendation is significantly different from that described in the draft EAs, comments on Chapter 7 and Appendix B of the draft EAs that were specifically concerned with the ranking of sites or the methodology are not addressed here. These include comments on the specific ranking (i.e., criticisms or endorsements) of sites on particular guidelines, aggregate rankings, and the methodology itself. For such comments the issues are summarized, however, to show the concerns of the commenters. The reader interested in the ratings assigned to the sites is referred to the multiattribute utility analysis of the nominated sites and the recommendation of candidate sites. The comments that are addressed here are those that sought clarification about, or commented on, the comparative evaluation of the sites in the draft EAs rather than simply disagreeing or agreeing with a ranking; they include, for example, comments suggesting factors that should have been considered in the evaluation or questioning the use of a particular assumption. These comments were divided into two categories: (1) comparative evaluations against postclosure guidelines and (2) comparative evaluations against preclosure guidelines.

C.3.4.1 Comparison of sites on the basis of postclosure guidelines

Comments on the comparative evaluation of sites against the postclosure guidelines covered each guideline. They included questions about the findings made for particular conditions of the guidelines, comments about the data base, and recommendations for expanding or improving the analysis. As already explained, comments that were specifically concerned with ranking or methodology are not addressed here. Comments about the evaluations of individual sites against the postclosure guidelines are addressed in Section C.5 of the final EA for the particular site.

C.3.4.1.1 System guideline

Issue

A commenter stated that the DOE's failure to compare the sites on the basis of the postclosure system guideline masks the Hanford site's alleged inferior performance in comparison with the other sites.

Response

A comparison of sites against the system guidelines was not performed for the draft EA, because the available data were deemed insufficient for assessing the performance of the total repository.

Both the draft and the final EAs report the results of preliminary performance assessments, but these results were not appropriate for use as the basis for selecting sites for recommendation.

C.3.4.1.2 Geohydrology

The comparative evaluation of the sites against the postclosure guideline on geohydrology elicited many comments. The issues raised included the definition of the accessible environment, the estimates of ground-water travel times and the analyses on which they were based, risk to regional water sources, the comparison of sites in saturated and unsaturated zones, the adequacy of the data base, and criticisms of the findings for specific sites.

Issue

One commenter noted that Chapter 7 of the EAs should be revised to take into account the 2-kilometer distance to the accessible environment rather than 10 kilometers. This would be consistent with draft 5 of the EPA standard.

Response

Analyses in Chapters 6 and 7 have been revised to use a distance of 5 kilometers to the accessible environment. The 5-kilometer distance is consistent with the final EPA standards, which were published in September 1985 (EPA, 1985). (See also Section C.3.1.1 for comments on the definition of the accessible environment in the guidelines.)

Issue

Two commenters felt that the discussion of favorable condition 3, ease of characterizing and modeling, was much too brief. This condition is considered to be not present at all five sites.

Response

The DOE agrees with the comment; the text has been revised to indicate that favorable condition 3 is a major consideration. The discussion has been expanded to more completely discuss uncertainty in characterizing and modeling each of the sites.

Issue

Two commenters asked whether the four subconditions under favorable condition 4 are of equal weight and recommended that ground-water flux be a factor in assessing the sites.

Response

In terms of making a finding on this favorable condition, the four subconditions are of equal weight in that the presence of any one subcondition results in a finding of present. The DOE agrees that ground-water flux should be a factor in assessing the sites and has revised the evaluation of the sites against the geohydrology guideline to explicitly consider it.

Issue

Several commenters were concerned with the uncertainty in ground-water travel times in the comparative evaluations of sites against the geohydrology guideline. One commenter said that the lack of data on the complexity of

ground-water flow paths was not adequately assessed. Another party provided alternative travel-time calculations, including faster travel times than those presented in Chapter 7. A third commenter contended that the approach to ground-water modeling in the draft EA is not conservative and therefore does not compensate for uncertainty in data. One commenter felt that the range of travel times, such as 87,000 to 361,000 years, is large enough to indicate that not enough data are available for an accurate prediction. Another commenter challenged the statement that the dry conditions at Yucca Mountain almost compensate for the shorter travel times in comparison with salt, saying that this conclusion is unsupported, and questioned DOE's ability to ultimately characterize and model this site.

Response

The travel-time analysis has been reviewed and extensively revised in response to various comments. A stochastic analysis has been completed for all five sites, using ranges of key hydrologic parameters to better represent the varying uncertainties in the data base. The DOE agrees that there are not enough data to make accurate predictions of ground-water travel times. However, the DOE considers that the preliminary modeling is sufficient for comparative evaluations of the five sites for the purposes of the EAs. With respect to Yucca Mountain, the DOE has reconsidered the relative ranking of the site to reflect the uncertainties in characterizing and modeling and in the range of travel times when compared with the salt sites. However, the DOE considers that all five sites can ultimately be characterized and modeled with reasonable certainty.

Issue

One commenter questioned whether the four subconditions under favorable condition 4 of the geohydrology guideline are of equal weight. If they are not, then the sites are not being evaluated against this guideline in an equitable manner.

Response

The four subconditions of favorable condition 4 address the components of ground-water travel time and therefore bear on a single parameter. In that respect, the guideline can be viewed as treating each site equitably.

Issue

One comment said that neither Chapter 7 nor Appendix A of the draft EAs discusses the relative risk posed by a repository to various regional water resources, such as the Ogallala aquifer and the Colorado River.

Response

Risk to various regional water resources is considered under the qualifying condition for each postclosure technical guideline: a site will be qualified under each of the postclosure technical guidelines only if the repository will not be likely to lead to radionuclide releases greater than those referenced in the postclosure system guideline. The postclosure system guideline requires compliance with the EPA and NRC regulations for waste

disposal and requires that the geologic setting of a site allow for the physical separation of radioactive waste from the accessible environment in accordance with the specified regulations. The accessible environment by definition includes regional water resources outside the controlled area of the repository. In addition, the guideline on geohydrology includes a potentially adverse condition of the presence of ground-water sources, suitable for crop irrigation or human consumption without treatment, along ground-water flow paths from the host rock to the accessible environment. If this potentially adverse condition is present at a site and is judged to be sufficiently adverse to preclude meeting the qualifying condition, then a site will be disqualified.

Issue

Some parties said that the flow of ground water through salt may not be in accordance with Darcy's law. The process of diffusion and the flow of ground water through fractures in salt may predominate and should be considered.

Response

The question of Darcian flow in salt and the potential for diffusion and flow through fractures are evaluated in the final EAs. The question of ground-water flow through a body of salt has not been resolved at this time and will be addressed during site characterization.

Issue

Many comments said that the calculations of ground-water travel time for the Hanford site are inappropriate. In addition, one party noted that the Basalt Waste Isolation Project had failed to comply with NRC's request in the "Draft Issue-Oriented Site Technical Position (ISTP) for BWIP," Section 1.0, page 6.

Response

Concerns about the analysis of ground-water-travel time for the Hanford site have been reviewed and are addressed in Section C.5.11 of the final EA for the Hanford site. Modifications to the conceptual model, the data base, and the revised calculation of the ground-water-travel time from the repository to the accessible environment 5 miles away have been made in Section 6.4.2.6.1 of the final EA for Hanford. Such an analysis is required to determine whether the first favorable condition and the disqualifying condition for the geohydrology guideline are present.

Compliance with the "Draft Issue-Oriented Site Technical Position for the Basalt Waste Isolation Project" is not in question. The purpose of the document was to identify technical issues that would have to be resolved during site characterization. The Nuclear Regulatory Commission did not request that the issues be resolved before the publication of the final EA.

Issue

One commenter noted that the travel-time discussion for the Hanford site gives the misleading impression that the travel times are based on 50 transmissivity values.

Response

The discussion of travel time has been extensively revised to be consistent with additional analyses completed for the final EA. The point raised by the commenter has been clarified.

Issue

One commenter stated that favorable condition 1 of the geohydrology guideline should not be considered present at the Hanford site. Hanford may be the only site where this condition is not met.

Response

Ground-water-travel times have been extensively reanalyzed for all five sites in response to comments on the draft EAs. For the Hanford site, key hydraulic parameters were conservatively evaluated over appreciable ranges in the stochastic model to account for uncertainty. The results indicate a probability of 0.22 for a travel time of less than 10,000 years. However, the median travel time is less than 34,000 years. Because the median travel time best represents the expected value, it appears that, on the basis of currently available data, this favorable condition can be met. The commenter is referred to Sections C.5.8 and C.5.11 of the final EA for the Hanford site for detailed responses to comments on the analysis of ground-water-travel time and uncertainties in the key hydraulic parameters used in this analysis.

Issue

One commenter argued that, since the ground-water-travel times for the bedded-salt sites in Utah and Texas were attributed to secondary permeability features and this was untrue, favorable condition 1 of the geohydrology guideline is not present at the Utah and the Texas sites.

Response

The appropriateness of including secondary permeability features is evaluated in the final EAs.

Issue

One commenter suggested that the DOE reconsider the rating of the Davis Canyon site under the geohydrology guideline in Chapter 7. Specific findings for Davis Canyon were questioned, with comments including the following:

- Favorable condition 1 should be considered to be not present, because a conservative analysis should include a catastrophic early release to the upper and the lower hydrostratigraphic units. If fracture flow is assumed, the ground-water-travel times within these units could be less than 10,000 years.

- Favorable condition 2 should be considered not present, because the effects of potential dissolution features, such as fault R, were not considered.
- Favorable condition 4 should be considered not present. Credit should not be taken for conditions 4(i) and 4(ii) if the effect of secondary permeability is considered.
- Potentially adverse condition 1 should be reevaluated to take into account the effects of thermal buoyancy or the hydraulic gradient.
- Potentially adverse condition 2 should be reevaluated to consider flow paths upward to overlying units with a total-dissolved-solids content of less than 10,000 ppm.

Response

The DOE has reconsidered the rating of the Davis Canyon site with respect to the geohydrology guideline. The relative ranking of this site with respect to the Richton Dome has been lowered. The specific comments on guideline conditions can be answered as follows:

- Favorable condition 1 is still considered to be present. No mechanism has been identified for a catastrophic early release to the upper and the lower hydrostratigraphic units. Revised travel-time calculations consider unlikely flow paths that might result from fracture zones, although there is no evidence that such zones exist. The revised travel times exceed 10,000 years.
- Favorable condition 2 is also still considered to be present. The revised discussion takes into account the potential for dissolution, including fault R. The stratigraphic offset along fault R is interpreted to be insufficient to be conducive to dissolution. Breccia pipes and other dissolution features are discussed in Chapter 6 of the Davis Canyon EA under the postclosure guideline on dissolution.
- The DOE has reevaluated favorable condition 4 and agrees that condition 4(ii) is not present. However, condition 4(i) is considered present because available data indicate that the host rock and the immediately surrounding units have low hydraulic conductivities. To claim that favorable condition 4 is present, only one of the subconditions needs to be present.
- Potentially adverse condition 1 covers only natural changes in geohydrologic conditions; changes related to repository construction and waste emplacement, such as thermal buoyancy, are evaluated under the postclosure guideline on rock characteristics.
- The revised travel-time analysis does evaluate flow paths upward from the proposed repository host rock because of the potential for localized upward gradients at the Davis Canyon site. The results of this analysis suggest that upward flow paths would reach the accessible environment laterally rather than through overlying units containing ground-water sources with a low total-dissolved-solids content.

Issue

One commenter noted that Davis Canyon has superior geohydrologic conditions when compared with Deaf Smith in terms of the ground-water-travel time and should rank high.

Response

The DOE agrees; the relative ranking on the geohydrology guideline has been revised to show that, with respect to the geohydrology guideline, the Davis Canyon site is preferable to the Deaf Smith site.

Issue

Two commenters suggested that the hydraulic conductivities in the host rock and the surrounding units are low at the Richton Dome; therefore favorable condition 4(i) and hence favorable condition 4 should be considered present at this site.

Response

The DOE agrees that the hydraulic conductivity within the host rock is very low at the Richton Dome. However, the horizontal hydraulic conductivity in the surrounding units ranges from 2.2 to 4.6×10^{-6} meter per day (7.2 to 1.5×10^{-5} foot per day). This range of horizontal hydraulic conductivities for the surrounding units does not support a finding that condition 4(i) is present.

Issue

One commenter suggested that the ranking of the Richton Dome should be lowered because of the likelihood of radionuclide transport in water and pointed out that, according to Chapter 3 of the draft EA, ground water moves up from the lower to the upper aquifer, providing a mechanism for radionuclide contamination of usable aquifers. Water in the upper aquifer flows toward Richton. There are no data on fluid movement in anomalous zones or within the salt. In addition, consideration should be given to the possible contamination of drinking water during site characterization.

Response

In the final EA for the Richton Dome, the boundary of the accessible environment is considered the edge of the salt dome. Therefore, if the Richton Dome is selected for site characterization, any radionuclide releases to the lower aquifer will have to be demonstrated to be within the limits specified by the EPA standards. In addition, the presence or the absence of anomalous zones and the mechanism of fluid movement within the dome will have to be resolved. Preliminary estimates of fluid movement within the Richton Dome suggest that ground-water travel within the Dome is very slow if it happens at all. Therefore, the DOE considers the Richton Dome to be more favorable than the other four sites with respect to the geohydrology guideline. No contamination of ground water is expected from site characterization; the commenter is referred to Chapter 4 of the final EA for the Richton Dome for a discussion of the possible effects of site characterization.

Issue

One commenter noted that the ground-water-travel times for the Yucca Mountain site in Chapter 7 are inconsistent with the travel time in Chapter 6 of the draft EA for Yucca Mountain. The final EA should contain a consistent value or range of values for travel times.

Response

For the Yucca Mountain site, Chapter 7 of the draft EA cites a minimum ground-water-travel time from the edge of the engineered-barrier system to the accessible environment of 23,000 years, and not 47,000 years as noted in the comment. Estimates of ground-water-travel time for the Yucca Mountain site have, however, been extensively revised for the final EA, and a consistent range of travel times is contained in the final document.

Issue

For Yucca Mountain, one commenter questioned the finding of "present" for favorable condition 2 of the geohydrology guideline, saying that the data on cyclic fluctuations in precipitation and changes in water-table elevation are insufficient to make a positive finding for this condition.

Response

The effects of Quaternary hydrologic processes on the ability of the Yucca Mountain site to isolate waste have been evaluated. These evaluations were based on geologic data, preliminary modeling of a rise in the water table under pluvial conditions, and a preliminary performance assessment. Preliminary modeling of increases in the water table during a full pluvial cycle with a 100-percent increase in precipitation suggests that the water table would experience a 130-meter rise. If pluvial conditions were to recur, significant increases in ground-water flux and decreases in ground-water-travel time could occur. However, a preliminary performance assessment for a repository at Yucca Mountain does not suggest a significant effect on waste isolation.

Issue

One commenter noted that, because of the lack of understanding of the unsaturated zone and the fact that the DOE concludes that the knowledge of the waste-isolation capability of Yucca Mountain is uncertain, it is unrealistic to compare a site in the unsaturated zone (Yucca Mountain) with four sites in saturated zones.

Response

The DOE acknowledges the lack of understanding of the unsaturated zone at Yucca Mountain. However, there are also uncertainties in the characterization and modeling of the four sites in saturated zones. For example, the mechanism of ground-water flow in salt is uncertain, the role of fracture flow at the bedded-salt sites is uncertain, and the magnitude of vertical conductivity at the basalt site has not been quantified. The DOE has not concluded that the waste-isolation capability of Yucca Mountain is uncertain; on the contrary, it

expects that the uncertainties in the data base and in the preliminary modeling of the unsaturated zone can be resolved with reasonable assurance during site characterization. The DOE does not consider that a comparison of a site in the unsaturated zone at Yucca Mountain with four sites in the saturated zone is unrealistic.

Issue

One commenter noted that the data base used for the comparative evaluation of Yucca Mountain against the geohydrology guideline consists of two wells in the unsaturated zone and 30 wells in the saturated zone. Additional data from the unsaturated zone are required to base conclusions about geohydrology; data should not be extrapolated from the saturated zone to the unsaturated zone.

Response

The DOE agrees that additional data from the unsaturated zone will be required if the Yucca Mountain site is selected for characterization. However, the preliminary data from the unsaturated zone at Yucca Mountain are considered sufficient for comparative evaluations of sites against the guidelines. The site-specific data base for Yucca Mountain is, in fact, more extensive than the data base for the three salt sites.

Issue

One commenter asked why, in the discussion of favorable condition 2, which is related to hydrologic processes during the Quaternary Period, cyclic fluctuations in precipitation were considered only for the Yucca Mountain site.

Response

The discussion of cyclic fluctuations in precipitation during the Quaternary is emphasized for Yucca Mountain because increased precipitation affects flow through the unsaturated zone and the elevation of the water table, and therefore favorable condition 2 is not present at Yucca Mountain. As stated in the text, similar processes have been evaluated for the other sites, but the effects of these processes are not likely to adversely affect waste isolation; therefore, the favorable condition is present at the other four sites. The text of the final EAs has been revised to discuss Quaternary hydrologic processes at each of the sites in greater detail.

Issue

One commenter recommended that the discussion of ground-water-travel time at Yucca Mountain, specifically travel through the Calico Hills nonwelded tuff unit, be clarified.

Response

The suggestion was accepted, and the discussion has been clarified.

C.3.4.1.3 Geochemistry

The comments about the comparative evaluation of sites against the geochemistry guideline covered inconsistencies in the discussion of geochemical conditions in Chapters 6 and 7 of the EAs, disparities in the data available for the various host rocks, and specific suggestions for the findings made for particular sites.

Issue

One commenter was concerned with disparities in the comparison of the sites with respect to the availability of data and the types of data for the geochemistry guideline. Favorable conditions 1 through 4 compare sites on the basis of various conditions that lead to a common result (i.e., isolation). It is not understood how distinct properties like oxidation-reduction conditions and sorptive properties can be equated, especially in light of differing uncertainties.

Response

Uncertainties in the geochemistry of all sites are admittedly present, and the geochemical data base for the sites varies with respect to the types as well as the amount of data. The definitive data for each site will be collected during site characterization. However, the data that are available are adequate for the purposes of the EAs. Geochemical data have been collectively evaluated in the preliminary performance assessments reported in Chapter 6 as the data relate to radionuclide solubility and retardation with respect to EPA standards (EPA, 1985) and NRC criteria (NRC, 1983).

Issue

A commenter criticized the DOE for its subjective treatment of available data to arrive at subjective conclusions as to which site is better than the other. Statistical procedures were then applied to the DOE's "subjectively determined data (rankings under each guideline)" to arrive at the best of five sites. The commenter also felt that the "subjective" conclusions were compounded by the ranking method.

Response

The DOE used the available data from each site, which includes site-specific data as well as regional data, plus professional judgment in order to perform a comparative evaluation of the sites against the guidelines. As already mentioned, the shortcomings of the ranking method used in the draft EA have been corrected.

Issue

The reviewer states that a major shortcoming with the draft EA for the Hanford site is that major concerns are evaluated "with short-term projections." Thus, the EA does not address the long-term problems that are posed by long-lived radionuclides (i.e., thousands of years).

Response

It is assumed that "major concerns" include waste-package lifetime, ground-water-travel time, and radionuclide release rate and retardation. Contrary to the impression of the reviewer, each of these concerns has been evaluated with respect to long-term waste containment and waste isolation. For example, the mean lifetime of the waste-package container is expected to be approximately 6,100 years \pm 600 years on the basis of the corrosion rate.

Issue

One commenter said that the Hanford site does not have the advantages of salt. Salt provides excellent radiation shielding, is chemically active with regard to radiation-generated products, and has a higher thermal conductivity than basalt.

Response

Basalt and the associated ground water have significant advantages over salt (e.g., low oxidation-reduction potential, high sorptive capacity). It is true that salt and brine are chemically active when exposed to radiation; however, this reactivity makes salt somewhat less desirable than basalt. For example, gamma and alpha radiations produce more oxidizing products (from radiolysis) in a brine than in fresh water. In addition, rock salt is a poor sorbant for radionuclides. While it is true that salt has a higher thermal conductivity than basalt, the presence of water in the repository at Hanford would aid in the transfer of heat from the area.

Issue

One commenter felt that the salt sites should not be assigned a finding of "not present" for favorable condition 5 solely on the basis of data inadequacy. This party also questioned why such data needs were not investigated in the site-screening process that led to the identification of potentially acceptable sites.

Response

The mineralogic and chemical properties of salt deposits and the associated ground water are not conducive to the physical and chemical retardation of radionuclides (e.g., rock salt has poor sorption properties and brine further inhibits sorptive processes). On this basis, it was deemed conservative to assign the finding of "not present" for favorable condition 5.

Issue

One commenter noted that, even though high salinity inhibits the formation of colloids and particulates, the discussion for the Deaf Smith site suggests that all aquifers at the site contain saline water. It was noted that the upper aquifers contain fresh water.

Response

The discussion has been corrected in the final EA.

Issue

One commenter noted that the Deaf Smith site has no known radionuclide-sorbing minerals.

Response

Little work has been done on the mineral composition of the rock formulations at the Deaf Smith site. Preliminary work by the Texas Bureau of Economic Geology has shown that clay minerals may be present in the muds and mudstone interbeds of the Unit 4 halite of the San Andres Formation. However, because of the preliminary nature of this work, no credit is taken for sorption at the Deaf Smith site. This is noted in the final EA.

Issue

A commenter said that the Richton Dome site should be ranked lower than the Deaf Smith and the Davis Canyon sites for geochemistry because the "accessible environment" is defined as the edge of the salt stock and does not include adjacent aquifers and their retardation properties. Credit for the travel of radionuclides through the adjacent aquifers is irrelevant to the evaluation of the site.

Response

Because of the paucity of data for all of the salt sites, no credit is taken at present for the retardation characteristics of adjacent aquifers at any of these sites. While it is expected that additional retardation of radionuclides within these aquifers will take place, it is not possible to estimate the significance of such retardation effects without site-specific data. Thus, for the sake of conservatism, no credit for retardation in adjacent aquifers has been taken for any of the salt sites.

Issue

One reviewer noted that the radionuclide-complexing effects of carbonate are described in Chapter 7, mentioned only in passing in Chapter 3, and not mentioned at all in Chapter 6.

Response

A more balanced discussion of carbonate now appears in all three chapters.

Issue

One reviewer felt that the presence of carnallite, organic matter, and hydrocarbons at the Davis Canyon site and their absence at the Deaf Smith site should result in Davis Canyon being ranked lower than, or at least equal to, Deaf Smith.

Response

In the final EA, the Davis Canyon and the Deaf Smith sites are considered to have approximately equal geochemical properties. The uncertainties regarding organic materials (including hydrocarbons) are great because of the

paucity of data for both sites. The available data indicate that carnallite may not be a problem at the Davis Canyon site because the carnallite-bearing zone apparently thins in the direction of Davis Canyon; however, this is also uncertain. Potential problems at the Deaf Smith site include the presence of mudstone interbeds and intercrystalline muds that contain clay minerals. Both carnallite and the muds and mudstone interbeds may provide high-magnesium brines during the lifetime of the repository.

Issue

A commenter expressed concern that a statement in Chapter 7 to the effect that the clays at the Swisher and the Deaf Smith sites would "strongly enhance" the sorption of radionuclides is not supported by the discussion in Chapter 6.

Response

In Chapter 7 of the final EAs no credit is taken for the sorptive properties of clays at either the Swisher or the Deaf Smith site.

Issue

One commenter noted that, in regard to favorable condition 2 of the geochemistry guidelines, Chapters 6 and 7 state that "brines will tend to promote the agglomeration of some types of colloids" and that the highly saline ground waters at the Richton Dome will inhibit the formation of colloids. On the basis of the evaluation in the draft EA, it cannot be unequivocally claimed that the evidence supports a favorable finding for this condition.

Response

It should be noted that favorable condition 2 covers a number of geochemical mechanisms, one of which is the formation of colloids. The final EA states that too little is known about particulates, colloids, and organics at each site to evaluate them at this time; favorable condition 1 is evaluated on the basis of other, and better-known, geochemical mechanisms.

Issue

A commenter pointed out that the Richton Dome is ranked lower than the bedded-salt sites, partly because the ground water at Richton is "less reducing than that of the bedded salt sites." The commenter claimed that the data do not support this statement.

Response

This discussion has been modified in the final EA. All three salt sites are now considered to be equal in terms of geochemical conditions, partly because of the paucity of data.

Issue

Some commenters noted that potentially adverse condition 3 of the geochemistry guideline (oxidizing conditions) is present at Yucca Mountain but was not considered in the overall evaluation of the five sites in Chapter 7.

Response

This omission is acknowledged. Potentially adverse condition 3, which is present only at Yucca Mountain, has been considered in the evaluation of the five sites in the final EA.

Issue

One reviewer suggested that, because the Yucca Mountain site is in the unsaturated zone and is not expected to become saturated with infiltrating surface water, the presence of oxidizing conditions (potentially adverse condition 3) is irrelevant. The lack of ground water in the Topopah Springs Member of the Paintbrush Tuff suggests that this condition does not apply to this site.

Response

This condition does apply because ground water, as defined in the guidelines, includes the water in the unsaturated zone whether transient or trapped in pore spaces.

Issue

A commenter noted that a statement in Chapter 7 indicates that no heat-induced alteration of zeolites in tuff at Yucca Mountain is expected. This is inconsistent with Chapter 6, which states that heulandite and smectite may be adversely affected by the heat emitted from the waste emplaced in the repository.

Response

This inconsistency has been corrected in the final EA.

C.3.4.1.4 Rock characteristics

Issue

Two commenters disagreed that "phenomena that could affect isolation... are not expected to have significant effects at any of the sites," as stated on page 7-27 of the draft EAs. One of them said that this statement revealed the DOE's intention of not using certain guidelines.

Response

The cited statement was poorly worded. It should have read "phenomena that could affect isolation...are not expected to produce effects exceeding regulatory limits at any of the sites." As can be seen from Chapters 6 and 7

of the draft and final EAs, each site was evaluated against every technical guideline, and every technical guideline was used in the comparative evaluation of sites.

Issue

One commenter felt that the summary section did not give a detailed explanation of the expected effects of brine migration at each site.

Response

Brine migration is discussed in Section 6.3.1.3.6 of each EA.

Issue

One commenter felt that on favorable condition 2 for postclosure rock characteristics all sites could be given a finding of "present," but should not be considered equal. The commenter felt that the salt sites should be given a higher rating because more of the three conditions specified--high thermal conductivity, low coefficient of thermal expansion, and sufficient ductility to seal fractures--have been demonstrated in salt.

Response

In the final evaluation of sites for recommendation for site characterization, the postclosure guideline on rock characteristics--including the cited favorable condition--is only one of the three guidelines grouped together in a major consideration that examines the effects of repository-induced heat.

Issue

One commenter asked whether rock porosity has been adequately measured.

Response

Since the largest specimens sampled to date are the cores from exploratory drilling, this is the size of specimens on which porosity has been measured. Larger-scale measurements of porosity can be made indirectly by geophysical logging techniques. Larger-scale measurements of porosity will be made during site characterization.

Issue

One commenter requested that the differences between the expected performance of the saturated and the unsaturated zones be mentioned in the discussion of postclosure rock characteristics in the EA for the Hanford site.

Response

The DOE recognizes that there are distinct and different advantages to each of these emplacement conditions. Since the candidate horizon at the Hanford site is in the saturated zone, it is inappropriate to describe the advantages of the unsaturated zone in the EA for the Hanford site.

Issue

One commenter requested that the magnitude of the thermal pulse be discussed in the EAs, to evaluate its significance for the postclosure guidelines.

Response

The effects of heat are described in Sections 6.3.1.3.4, 6.3.1.3.6, and 6.3.1.3.7 of the EAs. Not all the expected effects of heat are discussed in a particular section.

Issue

One commenter asked whether fractures can be thermally induced.

Response

Fractures can be thermally induced, but fractures have not been observed to be sizable under dry conditions. Thermally induced fractures usually occur from rapid increases or decreases in the heat content of a rock or through heat loadings that would be far more severe than those of a repository. Additional data on the potential effects of thermally induced fracturing on repository performance will be gathered during site characterization.

Issue

One party felt that, according to the results in Table 7-17, the basalt site (Hanford) should be ranked higher than the Deaf Smith site.

Response

In regard to Table 7-17 of the draft EAs, the commenter is correct.

Issue

A commenter disagreed with the finding for the Hanford site of "not present" for potentially adverse condition 2 of the rock-characteristics guideline, saying that "the potential for thermally induced fracturing and for the dehydration of fracture (infilling) material is present at the Hanford site, though it may occur only in areas near individual waste packages."

Response

The reasoning behind the finding of "not present" for potentially adverse condition 2 for this guideline is given in Section 6.3.1.3.6 of the final EA for the Hanford site.

Issue

One commenter questioned the basis for the statement that potential stability problems would not affect the containment and isolation capability of the Hanford site.

Response

At the Hanford site, all excavations would be backfilled before closure, but there would be some limits to the degree of rock adjustment that can take place. The Hanford site is not initially taking credit for the containment capability of the host rock and intends to demonstrate that the site performs acceptably without taking credit for travel through the dense interior.

Issue

One commenter felt that the evaluation of the Richton Dome site against the postclosure guideline on rock characteristics should consider the presence of anomalous zones.

Response

The DOE acknowledges this concern and has expanded Sections 6.3.3.2.1 and 6.3.1.3.2 in the final EA for the Richton Dome to discuss this topic.

Issue

One commenter asked why the Davis Canyon and the Deaf Smith sites were ranked close together on postclosure rock characteristics when the discussion for the preclosure guideline on rock characteristics indicates more-substantial differences between the sites.

Response

The term "flexibility" is considered to have a different meaning in the preclosure and the postclosure guidelines. Before closure, the DOE is concerned about whether a repository can be constructed. For the postclosure period, the DOE is concerned about how well the host rock (and other components) will isolate the waste from the accessible environment. Thus, the flexibility portions of the two guidelines are not equivalent. The preclosure and the postclosure evaluations are consistent with the intent of each guideline.

Issue

One commenter felt that insufficient credit has been given to the Davis Canyon site for the higher rock strength that results from a lack of clay insolubles in the host rock.

Response

Because of the lack of data from boreholes, rock strength at the Davis Canyon site is associated with a high uncertainty. Salt in general is a low-strength rock and is described as such in Section 6.3.1.3 of the EA for Davis Canyon. To claim an advantage for the Davis Canyon site at this time is not considered conservative.

Issue

One commenter stated that at the Davis Canyon site the carnallite contained in the rock salt would melt at repository operating temperatures, producing corrosive brine and volume changes.

Response

The corrosive effects of carnallite are discussed in Section 3.2.7 of the EA for Davis Canyon. The volume percentage of carnallite is small, and the effect of melting such a small volumetric fraction is not considered significant at present.

Issue

One commenter was concerned that at the Davis Canyon site the repository horizon would be the uppermost salt bed (salt cycle 6), and hence the salt barriers to the upward migration of radionuclides would be minimal.

Response

The significant Pennsylvanian and Permian strata overlying the host rock would provide an adequate barrier. Furthermore, the hydrologic gradients at the site are predominantly downward.

Issue

One comment about the Davis Canyon site said that thermal uplift will cause fracturing in the upper 625 feet of the overburden above the site, including extensive portions of the Cedar Mesa and the Elephant Canyon Formations, both of which supply water to wells and springs in the Canyonlands National Park.

Response

Thermal uplift has been calculated to provide a maximum lift of approximately 1 meter. Thermal dispersion would probably prevent this uplift from seriously displacing strata and interrupting aquifer continuity.

Issue

One commenter felt that the Yucca Mountain site should be ranked more highly on postclosure rock characteristics than the Deaf Smith site because Yucca Mountain appears to be more favorable in Table 7-3.

Response

The principal reason for this apparent discrepancy is explained in the fourth paragraph on page 7-27 of the draft EAs.

C.3.4.1.5 Climatic change

Issue

One reviewer questioned whether it is worth worrying about an increased precipitation and runoff in the next 10,000 years and the potential for perched water that might intersect the repository shaft.

Response

The DOE agrees. Such a scenario does not appear in the final EA.

Issue

A reviewer said that the Hanford site should be ranked lowest on the climatic-change guideline because of the potential for catastrophic flooding and lakes, as evidenced by recent catastrophic flooding.

Response

The Hanford site would not be affected by catastrophic flooding after repository closure because such flooding occurs on the surface and the shafts and boreholes would be sealed.

Issue

The reviewer inquired as to whether changes in surface-water conditions at the salt sites could increase salt dissolution and why these changes were not considered.

Response

This question is addressed in Section 6.3.1.4.2 of the draft and the final EAs for the salt sites.

Issue

One party noted that, in the climatic-change guideline, the conclusion for potentially adverse condition 1 for the Deaf Smith site is based on available data for the Quaternary Period. Yet the discussion on favorable condition 2 states that data for the Deaf Smith site are insufficient to determine the effects of changes on the hydrologic system.

Response

Potentially adverse condition 1 and favorable condition 2 are quite different. The latter states that climate changes have had little effect on the hydrologic system, whereas the potentially adverse condition states that climate changes could affect the ground-water flow system to significantly increase the transport of radionuclides to the accessible environment. Thus, the available data are adequate to address one, but not the other, condition.

Issue

One comment pointed out that an increase in the recharge and discharge of aquifers may not alter permeability within a salt sequence but might increase salt dissolution at the salt-rock interface and salt margins.

Response

While dissolution in these areas may be increased during times of increased recharge and discharge, the calculated rates of dissolution are conservative to account for any additional dissolution that may result from the increased availability of water.

Issue

The sites are ranked equally with respect to climatic change, yet Table 7-4 seems to rank Yucca Mountain slightly better than the other sites.

Response

In Table 7-4 of the draft EAs the Yucca Mountain site shows "not present" for a potentially adverse condition related to a potential rise in the water table. This applies only to Yucca Mountain; the other sites are below the unsaturated zone.

C.3.4.1.6 Erosion

A number of commenters expressed concern that the DOE has not adequately considered all information in the comparative evaluation of the sites against the guideline on erosion. The issues raised include changes in the ranking of sites, the relative importance of the potentially adverse and favorable conditions, and specific comments on erosion at Yucca Mountain and Hanford.

Issue

One commenter proposed that all sites except Yucca Mountain be ranked equal on the erosion guideline; Yucca Mountain should have a lower ranking because the repository would be closer to the surface.

Response

As stated in the draft EA, the objective of the erosion guideline is to ensure that erosional process acting on the surface will not be likely to lead to radionuclide releases greater than those allowed by regulations. The ranking evaluations in the draft EA were based on the qualifying, favorable, and potentially adverse conditions as they influence this objective.

Issue

One party argued that the favorable and potentially adverse condition for the erosion guideline are not of equal importance and should not be treated as equal.

Response

The DOE agrees. The qualifying condition relates to the requirements of 40 CFR Part 191, as implemented by the provisions of 10 CFR Part 60, and therefore the second favorable condition, if it is present, is the most significant because, according to 40 CFR Part 191, events with less than one chance in 10,000 over 10,000 years need not be considered in assessing postclosure performance. In general, if favorable condition 2 is present at a site, favorable condition 3 also is likely to be present and both potentially adverse conditions are likely to be absent. Because favorable condition 2 is present at all sites, all sites are rated equal with respect to the qualifying condition.

Issue

For the Hanford site, questions were raised regarding the proposed depth of the repository versus favorable condition 1 and the erosion depth from regional base levels discussed in favorable condition 2.

Response

Favorable condition 1 does not limit the depth of a repository; it merely says that ability to emplace waste at least 300 meters below the surface is favorable. The regional base levels in the draft and final EA for Hanford should be considered as bounding estimates, not as best estimates. Even under bounding estimates, Hanford was found to have favorable condition 2 and thus is rated the same as the other sites.

Issue

One commenter expressed concern that the evaluation of Yucca Mountain did not fully take into account portions of the repository whose depth is less than 300 meters.

Response

As reported in the draft and the final EA for Yucca Mountain, the minimum thickness of the overburden above the underground facility is about 230 meters, at the western edge of the primary area. However, for about 50 percent of Yucca Mountain the overburden is more than 300 meters thick. Because all of the repository would be at a depth greater than 200 meters, the site would not be disqualified. As stated in the draft EA, the fact that Yucca Mountain does not possess favorable condition 1 (waste emplacement below 300 meters) does not appear significant, because an evaluation of erosion rates for Yucca Mountain, applied to the 230-meter minimum depth, indicates that erosion would not significantly affect waste isolation over the next 10,000 years.

C.3.4.1.7 Dissolution

Issue

One reviewer felt that the draft EA did not consistently treat the favorable and the potentially adverse condition under dissolution for the three salt sites.

Response

The dissolution section in the final EAs has been revised to present a more consistent discussion of the two conditions for the salt sites.

Issue

One commenter objected to the statement that no significant dissolution has been identified at the Deaf Smith site because the statement is based on data from a well 3 miles from the site and seismic-reflection data that do not "cover" the site.

Response

While the available data from the area of the site do not unequivocally show that there is no dissolution at or near the site, data from boreholes, seismic-reflection measurements, as well as surface mapping have uncovered no evidence that significant dissolution occurred beneath the Southern Highlands at any time during the Quaternary Period.

Issue

One reviewer asked why the Pennsylvanian faults that occur 7 miles from the Davis Canyon site were not mentioned in the discussion on dissolution and whether the rates at which dissolution fronts are migrating could increase with the predicted increase in precipitation.

Response

The faults described by the reviewer die out in the lower part of the Paradox Formation; these faults have no surface expression. In addition, no indication of dissolution has been observed to be associated with these faults. In regard to the second question, no dissolution fronts have been identified in the study area. Discrete dissolution features like Lockhart Basin and Beef Basin may be affected by an increase in precipitation; however, the current rate of dissolution is not known.

Issue

One commenter objected to Yucca Mountain's receiving a finding of "not present" for the potentially adverse condition under the dissolution guideline. The repository would be near the breccia of the Solitario Canyon fault zone, which the draft EA does not discount as a dissolution phenomenon. Therefore, unless sufficient data are available to show that the fault is not related to caldera collapse, it should be assumed that the fault is a dissolution feature and the Yucca Mountain site should be considered as having this potentially adverse condition.

Response

The solubility of tuff in ground water is extremely low; furthermore, the hypothesis that the Solitario Canyon fault is a dissolution feature is not credible. Any breccia associated with the fault zone is of tectonic origin, and there is no logical reason to believe that the fault is the result of dissolution.

C.3.4.1.8 Tectonics

A number of commenters expressed concern that the DOE did not adequately consider all information in determining numerical ratings for the postclosure guideline on tectonics. Among the issues raised were the treatment of preexisting faults at the Deaf Smith site, the potential for diapirism in general and salt movement at the Gibson Dome as it relates to Davis Canyon, and the level of tectonic activity at the Yucca Mountain site.

Issue

One commenter wanted to know how preexisting faults at the Deaf Smith site were treated in the comparative evaluation against the postclosure guideline on tectonics.

Response

The evaluation of tectonic and igneous events is based on our understanding of those processes during the Quaternary Period. Faults that have been active during the Quaternary are more likely than older faults to be active now and for the next 10,000 years. The Deaf Smith site is different from the Davis Canyon site because Quaternary faults have been identified near Davis Canyon but not near Deaf Smith. Thus, Deaf Smith is more favorable with respect to Quaternary faults.

Issue

Some commenters asked why diapirism was not discussed in the comparative evaluation of sites, citing the Gibson Dome in Utah as a structure in which salt movement continues today.

Response

Potentially adverse condition 1 of the postclosure tectonics guideline is based on evidence of active tectonic processes, including diapirism. Although not explicitly discussed in Chapter 7, diapirism was evaluated in the draft EAs for the salt sites. As explained in Chapter 6 of the EAs, there is evidence that diapirism has not been active at any of the three salt sites during the Quaternary Period.

In regard to the Gibson Dome, the final EA for Davis Canyon explains that some degree of salt flow has occurred within the evaporite units near the Davis Canyon site, but the area of the site generally contains relatively undisturbed bedded salt.

Issue

Several comments pertained to the level of tectonic activity at the Yucca Mountain site and the treatment of tectonics in site evaluation.

Response

The evaluation of sites against the postclosure guideline on tectonics is primarily concerned with the effects of tectonic events on waste containment and isolation. As stated in the draft EA, the available data do not suggest that tectonic events at Yucca Mountain, Davis Canyon, and Hanford could both alter the hydrologic flow system and lead to radionuclide releases after repository closure. An accurate evaluation against the postclosure guideline on tectonics includes not only an assessment of the probabilities of events but also an assessment of whether an event could adversely affect the repository system.

In the final EA for the Yucca Mountain site, the discussion of repository performance has been expanded in Chapter 6 because the tectonic activity warrants additional discussion. The revised discussion adds perspective to issues on postclosure tectonics. It includes such factors as ground-water flux and travel time, waste-package integrity, the careful consideration during repository development of recognizable faults that appear to have any possibility of movement, and the geochemical capabilities of the site. While many studies remain to be completed, particularly with respect to probabilities, preliminary assessments of system performance suggest that tectonic events are not likely to lead to radionuclide releases in excess of regulatory limits.

Issue

One commenter argued that the DOE failed to identify or evaluate the seismic risk at Yucca Mountain (as shown in a map of seismic risk produced by the U.S. Geological Survey). The map clearly shows that Yucca Mountain is in a region of major seismic risk. The seismic risk in this region is much higher, in fact, than that at any of the other sites.

Response

The draft EAs recognize that the tectonic hazard at the Yucca Mountain site is higher than that for the other sites (page 7-116). Both the postclosure and the preclosure rankings (pages 7-44 and 7-115) reflect this relative comparison.

If the Yucca Mountain site is selected for characterization, site-specific estimates of seismic hazards will be made during characterization. In parallel with this, each site will be evaluated for the significance of tectonic hazards with respect to the total risk.

C.3.4.1.9 Natural resources

A number of commenters expressed concern that the DOE did not adequately consider all information in ranking the sites for the postclosure guideline on natural resources. The issues raised include the evaluation of future resources and the use of artificial markers as well as specific comments on resources at Deaf Smith, Davis Canyon, Hanford, and Yucca Mountain.

Issue

One commenter pointed out that the resources of today may not be the resources people will seek in the distant future.

Response

The evaluation of natural resources has been based on "reasonable projections of value, scarcity, and technology," as stated in the qualifying condition of the guideline. This statement is meant to reflect the NRC's 10 CFR Part 60, which states that the evaluation of the resource potential should consider whether economic extraction is currently feasible or potentially feasible during the foreseeable future. Thus the goal of natural-resource assessment is to ensure an acceptably low likelihood of postclosure human activities that would be detrimental to waste containment or isolation. This does not mean that the future development of a "new" resource can be absolutely ruled out, but, on the basis of our present understanding, this potential can be minimized. Furthermore, it is expected that permanent markers and records will also reduce the potential for human interference at the repository site.

Issue

One party commented that Chapter 7 of the draft EAs contained no more than a passing mention of artificial markers and asked whether there are any site-specific factors affecting the use of such markers.

Response

As stated in the qualifying condition for the postclosure guideline on natural resources, in assessing the likelihood of postclosure intrusion, the DOE will consider the estimated effectiveness of permanent markers and records. In evaluating the sites against the guidelines, the EAs qualitatively considered the effectiveness of markers and records in reducing the likelihood of human intrusion within the controlled area.

Issue

One party said that the Hanford site has a potential for ground-water resources and natural gas and should be disqualified for that reason.

Response

As discussed in the final EA for the Hanford site, the finding for potentially adverse condition 1 has been changed from "not present" to "present" because of the potential uses of ground-water resources and

natural gas. It should be noted, however, that although source beds (for hydrocarbons) may exist beneath the basalt, present exploration activity has not found adequate evidence of significant concentrations of any mineral or rock that is unique to the Hanford site. The geothermal potential of the site is considered nonfavorable. The revised evaluation of the Hanford site is based on the latest information on the potential for hydrocarbon and other resources. As the potential for resource extraction is by nature speculative and the use of permanent markers and records will assist in reducing the likelihood of human intrusion within the controlled area to very low values, the Hanford site should not be disqualified because of the potential for natural resources.

Issue

One commenter suggested that the EA for Davis Canyon evaluate ground water and the Colorado River as valuable natural resources. Another commenter noted that, although Chapter 7 suggests that only minor aquifers exist above the host rock at Davis Canyon, the Cedar Mesa sandstone aquifer, which overlies the host rock, is used as a water supply for the Canyonlands National Park.

Resources

As discussed in the final EA for Davis Canyon, ground-water use in the area and vicinity of the site is minimal. Existing wells yield small quantities of ground water from the Glen Canyon Group as well as the Cedar Mesa and Cutler strata; however, these wells are less than 400 feet deep. As such, ground water is not expected to have an adverse effect on the ground-water flow system. Section 3.3.1.5 of the final EA discusses water availability and demand, including the amounts of water available from the Colorado River in a Davis Canyon region. Because the Colorado River is too far for its use to be practical, it was not considered significant as a potential resource that would directly affect the Davis Canyon site.

The commenter is correct in noting that the Cedar Mesa sandstone aquifer supplies water for Canyonlands; however, this aquifer is not highly productive at the Davis Canyon site. As summarized in Chapter 3 of the draft EA, this aquifer produced only a few gallons per minute from its entire thickness at well GD-1.

Issue

One party questioned the assessment of natural resources at Yucca Mountain, saying that the mineral potential had been ineffectually evaluated.

Response

As discussed in the final EA for the Yucca Mountain site, there are no energy or mineral resources for which economic extraction is feasible in the foreseeable future. The DOE does not agree that the mineral potential of the site has been ineffectually evaluated. The evaluation is based on a review

of the literature, exploration and geologic mapping by the U.S. Geological Survey, and geochemical analyses of cores and cuttings taken from boreholes at and near Yucca Mountain.

C.3.4.1.10 Site ownership and control

Issue

The draft EA states that there is no basis for distinguishing among the sites in terms of site ownership and control at the beginning of the postclosure period, and therefore all sites were ranked equally on this guideline. One commenter asked why, if this is correct, land ownership is one of the guidelines.

Response

The postclosure guideline on site ownership and control is included in the siting guidelines to ensure consistency with the portion of NRC regulations in 10 CFR Part 60 that addresses the long-term control of the site by the DOE (10 CFR 60.121). In addition, this postclosure guideline is distinguished from the preclosure guideline on site ownership and control in two ways. First, the favorable condition for the preclosure guideline refers to the control of "...all surface and subsurface mineral and water rights by the DOE," whereas the favorable condition for the postclosure guideline refers to the "control of land and all surface and subsurface rights by the DOE." Second, the preclosure guideline is directed at the DOE's ability to control access to the site during repository operation, under the requirements of the system guideline for radiological safety. The postclosure guideline, in contrast, is a part of the human-interference guideline (960.4-2-8), which is intended to ensure that future generations will not compromise the integrity of the repository. Thus, although the DOE does not believe that there is currently a basis for discriminating among sites on the basis of postclosure site ownership and control, the guideline serves a necessary function in the siting process.

C.3.4.2 Comparison of sites on the basis of preclosure guidelines

The preclosure guidelines are divided into three groups, in order of decreasing importance: (1) preclosure radiological safety; (2) socioeconomics, environment, and transportation; and (3) ease and cost of siting, construction, operation, and closure. The issues raised in comments on the evaluation of the sites against these guidelines are summarized and addressed in this section.

C.3.4.2.1 Preclosure radiological safety

The preclosure guidelines on radiological safety consist of four separate guidelines: (1) population density and distribution, (2) site ownership and control, (3) meteorology, and (4) offsite installations and operations.

C.3.4.2.1.1 Population density and distribution

Issue

Many commenters stated that the evaluation of the Hanford site against the guideline on population density and distribution did not take into account the approximately 12,000 workers that the DOE and its contractors currently employ at the Hanford Site or the 3,500 of these 12,000 workers who work in the vicinity of the potential repository site. These commenters stated that the objective of the guideline is to protect the health and safety of both the public and repository workers and that the evaluation presented in the draft EA ignored the safety of the Hanford workers. Several of these commenters said that it is ridiculous to argue that the 3,500 Hanford workers in the vicinity of the site are "not members of the general public" as the draft EA states on page 7-57. Others insisted that the presence of these Hanford workers constitutes a high daytime population density for the site.

Response

The DOE agrees that the 3,500 Hanford workers must be considered members of the general public for the purposes of this evaluation. However, these persons work in the general vicinity of the site and not, as the guideline condition stipulates, "within the projected site boundaries."

Issue

One commenter noted that the draft EA reported the population density for the Hanford site as 43 persons per square mile and for the Richton Dome site as 40 persons per square mile, but nonetheless the Hanford site received a much higher score on this guideline than did the Richton Dome.

Response

The guideline on population density and distribution requires the DOE to evaluate the remoteness of the site from highly populated areas in addition to the population density of the general region of the site. While the population density is similar for both sites, the controlled area of a repository at the Richton Dome site would be adjacent to the town of Richton.

Issue

A few commenters stated that the evaluations of sites against the first favorable condition of the guideline on population density and distribution should consider transient populations. These commenters suggested that this condition might affect the population density given for the Davis Canyon site.

Response

Transient populations are explicitly considered by the first potentially adverse condition, which addresses high residential, seasonal, or daytime population densities within the projected site boundaries. Chapter 7 of the final EA also addresses such transient populations as users of offroad vehicles. These considerations do not significantly affect the population density for the Davis Canyon site.

C.3.4.2.1.2 Site ownership and control

Issue

Many commenters stated that the ranking of the Yucca Mountain and the Davis Canyon sites--both of which are on land owned by the Federal Government-- below the Richton Dome and Deaf Smith sites is indefensible and highly artificial. They insisted that to transfer land belonging to the Federal Government is easier than obtaining private land. One person said that persons who face the loss of their property will go through every legal means possible to keep their land. Another pointed out that the acquisition of private land is time consuming and expensive and that affected landowners have testified that they will not enter into voluntary leases or purchase-sell agreements; this commenter claimed that even identifying all of the affected owners of surface and subsurface rights will take time, given the large number of owners involved.

Two commenters noted that the Congressional action described as necessary in the draft EA for the Yucca Mountain and Davis Canyon sites would not be necessary until the time, or after, Congress approves the site for a repository, pursuant to Section 115 of the Act. They felt that it was ridiculous to argue that Congress would override a State veto of a site selection and then fail to expeditiously transfer land title to the DOE. All of these commenters therefore recommended ranking the Yucca Mountain and the Davis Canyon sites above the Richton Dome and the Deaf Smith sites because they believe that the transfer of land between Federal agencies is easier than obtaining private land.

One commenter stated that to obtain land at the Richton Dome site would create major, negative, and highly disruptive impacts for innocent citizens and that these impacts could be avoided at either the Yucca Mountain or the Davis Canyon site. Another party suggested that the Richton Dome site should be ranked below the Deaf Smith site because the privately owned land at Deaf Smith is agricultural land, of which there is no shortage.

Response

The guideline addresses only the complexity of procedures for acquiring the needed land. The complexity of these procedures does not necessarily reflect the value of the land or the associated social or economic impacts. The DOE is aware of the socioeconomic impact of acquiring lands, especially privately owned lands, and the socioeconomic aspects of land acquisition are

considered under the socioeconomic guideline. For example, the DOE recognizes that the condemnation of privately owned lands could disrupt the lives of displaced landowners.

Issue

One commenter recommended that the Richton Dome site be ranked last, just below the Deaf Smith site, because there are more landowners at Richton Dome than at Deaf Smith.

Response

The DOE has not determined exactly how many landowners there are at the Deaf Smith and the Richton Dome sites. If one or both of these sites are recommended for site characterization, the DOE will identify the affected landowners as part of the formal land-acquisition process.

C.3.4.2.1.3 Meteorology

Issue

One commenter stated that it is not possible to make a comparative evaluation of the sites against the meteorology guideline, because of the lack of data and inconsistencies in the types and quantities of data available for the various sites.

Response

The siting guidelines acknowledge that complete data would not be available for all evaluations of the sites against the guidelines. The guidelines provide for evaluating sites on the basis of available data. In evaluating the sites against the meteorology guideline, the DOE used best estimates based on available data and conservative assumptions.

Issue

Several persons commented on population considerations under the guideline on meteorology. One commenter stated that the size of offsite populations has not been appropriately considered under the ranking. Another noted that site comparisons would be facilitated if all EAs expressed population density as "persons per square mile" rather than "population densities higher than average." Another commenter requested that the workers employed at the Hanford Site be considered under this guideline.

Response

The meteorology guideline is concerned primarily with meteorological conditions and events that could affect the transport of radioactive materials to persons beyond the boundaries of the site. The characteristics of offsite populations are considered separately under the guideline on population density and distribution. Meteorological information is combined with information about the population to evaluate the sites under the system guideline for preclosure

radiological safety. If in comparing the sites against the meteorology guideline the DOE used population characteristics other than those specified by the guideline (i.e., location and density relative to regional density), double counting for population conditions would result.

The workers at the Hanford Site have been considered in determining the regional population density and in the final EA are specifically addressed under the guideline on population density and distribution.

Issue

Some commenters noted that the draft EAs for the Davis Canyon and the Hanford sites were inconsistent in the evaluation of the first potentially adverse condition of the meteorology guideline, and this inconsistency is reflected in the comparative evaluations of Chapter 7. The draft EA for Davis Canyon states that the town of Moab, 33 miles downwind, is close enough for the first potentially adverse condition to be present. However, the draft EA for Hanford says that the downwind city of Richland is sufficiently far from the site (22 miles) for the first potentially adverse condition to be not present. Similarly, the Hanford site, which appears to have more stagnation episodes than Davis Canyon, was ranked higher for dispersion conditions.

Response

The EAs have been revised to take a consistent approach on this condition. They define "prevailing meteorological conditions" to mean the most common annual average wind direction in any 22.5-degree sector and consider nearby population centers to be within a radius of 50 miles from the site, unless it is possible to document that atmospheric dispersion is sufficient to permit a smaller radius. As a result of this approach, the final EAs for both the Davis Canyon and the Hanford sites consider this potentially adverse condition to be present.

Issue

The Hanford site is not considered to have the second potentially adverse condition, which pertains to extreme weather, although Chapter 3 of the EA shows that part of the site would be inundated by the probable maximum flood and that the area has experienced a maximum snowfall of 24.5 inches.

Response

The second potentially adverse condition refers to the historical frequency of extreme weather. The probable maximum flood is a statistical worst-case flood. The DOE considers the 100-year flood to be an appropriately severe flood for this condition. The record snowfall occurred in 1916 and is not considered representative of recurrent conditions in the area of the site.

C.3.4.2.1.4 Offsite installations and operations

Issue

One person asked the DOE to explain how two sites with the same number of deleterious conditions can have different utility values. Another commenter suggested that the Hanford site be disqualified under this guideline because of conflict with nearby atomic-energy defense activities or, if it can be demonstrated that the conflict is not irreconcilable, that the ranking of the site be significantly lowered.

Response

Section 6.2.1.5 of the EA for the Hanford site demonstrates that there will be no irreconcilable conflict between a repository and nearby atomic-energy defense activities.

Issue

One party asked the DOE to identify the other nuclear installations that contribute to radioactive releases in the area of the Davis Canyon site.

Response

The contributing facilities are three uranium mines. They are discussed in Section 7.3.1.1.4 of the draft EA for the Davis Canyon site.

C.3.4.2.2 Environment, socioeconomics, and transportation

This group of preclosure guidelines consists of separate guidelines on (1) environmental quality, (2) socioeconomic impacts, and (3) transportation.

C.3.4.2.2.1 Environmental quality

Issue

A commenter requested that the sites be compared on the basis of their relative risk to water resources.

Response

The final EAs contain an evaluation of compliance with the ground-water protection requirements of the final EPA standards, 40 CFR Part 191 (EPA, 1985). These standards require that the repository may not cause the radionuclide concentrations in "a special source of ground water" to exceed specified limits for 1,000 years after waste emplacement.

The presence of sources of ground water suitable for crop irrigation or human consumption without treatment is potentially adverse condition 2 of the postclosure guideline on geohydrology. The comparative evaluation of sites

did include this condition (see Sections C.3.4.1.2 and C.5.1 for comments on geohydrology). In addition, the comparative evaluation included in the disqualifying condition for the preclosure guideline on socioeconomic impacts pertains to significant effects on the quantity or the quality of water from major water supplies (see Sections C.3.4.2.2 and C.7.4).

Issue

One commenter contended that the EA for the basalt (Hanford) site should acknowledge the presence of potentially adverse conditions regarding (1) projected major conflicts with environmental requirements and (2) significant adverse environmental impacts that cannot be avoided or mitigated. This contention was based on claims of uncontained hazardous materials and controversy over the discharges of radioactive materials from DOE facilities at Hanford.

Response

The guideline on environmental quality is concerned with significant adverse environmental impacts at the repository site. It does not address the effects of unrelated activities.

Issue

One commenter stated that the DOE has not done the work to determine whether or not significant Yakima Indian cultural or religious resources would be adversely affected, especially in light of previous effects on Gable Mountain. He felt that the fifth potentially adverse condition should be considered present at the Hanford site.

Response

Parts of Gable Mountain have been examined by a reconnaissance-level study that identified Gable Mountain and Gable Butte as having religious significance to local Indian groups. The DOE maintains that site characterization and repository development can be performed at the Hanford site without exerting any significant adverse effects on any significant Native American religious or cultural resources.

Issue

One person felt that the ranking of the Richton site should be lowered because environmental impacts would be experienced by the persons living at the site.

Response

The nearness of the town of Richton has been given due consideration in the evaluation of that site against the guideline on population density and distribution (see Sections C.3.4.2.1 and C.6.1 for comments on that guideline). To consider the population of Richton in evaluations against the guideline on environmental quality would result in double counting.

Issue

Several commenters said that greater emphasis should be placed on the proximity of the Davis Canyon site to the Canyonlands National Park.

Response

The guideline on environmental quality calls for an assessment of effects on any national parks and of irreconcilable conflicts with a park. The final EA for the Davis Canyon site presents such an evaluation for the Canyonlands National Park; the evaluation uses criteria developed by the National Park Service to test for irreconcilable conflicts. (See also Sections C.3.3 and C.7.1.)

Issue

One person said that the comparative evaluations should consider the uncertainties about the ability of the Deaf Smith site to comply with the requirements of the Texas Mine Shaft Act.

Response

The DOE acknowledges that uncertainties about compliance with environmental requirements should be considered in the comparative evaluation. The evaluation of the Deaf Smith site has been revised to address the uncertainty about compliance with the Texas Mine Shaft Act.

Issue

One commenter asked whether the DOE will guarantee protection of the Ogallala aquifer or, if not, how the DOE proposes to mitigate any releases into the Ogallala.

Response

It is the DOE's position that the quality of the environment at the Deaf Smith site can be adequately protected. Sections 4.2.1.4 and 5.2.2 of the Deaf Smith EA address protection of the Ogallala aquifer.

Issue

Several issues were raised about the Davis Canyon site. One commenter stated that air-quality impacts are double counted, being considered both under the environmental quality and the meteorology guidelines. Several commenters questioned the DOE's ability to determine the presence of an irreconcilable conflict with the Canyonlands National Park, since it appears that the DOE is not fully aware of the Park's designated uses. A commenter felt that, since neither favorable condition is present, the Davis Canyon site should possess both corresponding potentially adverse conditions. A commenter agreed that the site has the third potentially adverse condition, but believes it should have the fourth as well. It was noted by one commenter that the Davis Canyon site discussion should include the possibility of critical habitat. A commenter noted that the findings for the Davis Canyon site under

the first and the third disqualifying conditions were based on insufficient data and questioned the statement that repository-related activities will be conducted within the park.

Response

The only evaluation of air-quality impacts occurs under the environmental quality guideline. The meteorology guideline is concerned primarily with radiological safety; it addresses only those meteorological conditions and phenomena that affect the transport of radioactive material to offsite areas.

The DOE has expanded the evaluation of Canyonlands National Park and possible impacts throughout Sections 4.2 and 5.2, with summaries presented in Sections 4.4.1 and 5.5.1. The results of the evaluations show that there will be no irreconcilable conflict with the uses of the park.

The guideline did not intend for the pairs of first and second conditions to be reciprocal. Each pair delineates a possible range for that condition. Therefore it is possible to not have either condition. For example, on the second set the favorable condition is not present because it cannot be projected that impacts will be mitigated to insignificant levels. The corresponding potentially adverse condition is not present, however, because it is projected that significant impacts can be mitigated to acceptable levels.

Because of potential effects on the Newspaper Rock State Historical Monument, the evaluation of the Davis Canyon site was revised to state that the fourth potentially adverse condition is present. A summary of possible critical habitats was added to the comparative evaluation, but the finding for the sixth potentially adverse condition was not changed.

The evaluation of potential effects on the Canyonlands National Park has been revised and expanded, but the finding that the site is not disqualified (see Section 6.2.1.6.4) was not changed. It remains the DOE's position that no repository-related activities will need to be conducted in the Park.

The DOE considers the revised comparative evaluation to place an appropriate emphasis on the proximity of the Davis Canyon site to Canyonlands National Park. This evaluation is supported by Sections 4.4.1 and 5.5.1, which have been added to the EA for the Davis Canyon site.

C.3.4.2.2.2 Socioeconomic impacts

Issue

One commenter stated that, in evaluating the sites on Federal land, acceptance by the local population at present should not be weighted too highly because the acceptance must persist for 1,000 to 10,000 years.

Response

Acceptance by the local population is not directly considered in the comparative evaluation of sites because it is not included in the siting guidelines. Public acceptance, however, may affect the degree of conflict between old and new residents and can be used as an indicator of social impacts. In this light, the DOE does consider public acceptance as a contributing factor to the potential for social impacts. The long duration of the repository is acknowledged by the siting guidelines, which assign primary importance to postclosure conditions.

Issue

One commenter expressed concern over the choice of Hanford as a site for characterization, saying that whether a repository would help to "stabilize general economic conditions" is not as important as the long-term safety of the site. The commenter stated that the Columbia River, which borders on the Hanford Site, is used for irrigation and that site characterization at Hanford could adversely affect the agricultural economies of the States of Washington and Oregon.

Response

In order to be considered for a repository, a site must meet the qualifying conditions of all the siting guidelines. Failure to meet even one condition will disqualify the site. The objective of the guidelines is to ensure that any site selected for a repository will meet all the regulatory requirements for the protection of the health and safety of the public and the quality of the environment. The ability to meet these requirements will have to be demonstrated to the satisfaction of the Nuclear Regulatory Commission, which will issue the authorization to construct the repository.

The DOE does not expect that site characterization for the Hanford site would adversely affect agriculture in the State of Washington or Oregon. Since no radioactive waste would be accepted at the site during this phase, there is no potential for radioactivity to enter the Columbia River through ground-water seepage.

Issue

One commenter suggested that the comparative evaluation of the Deaf Smith and the Richton sites against the guideline on socioeconomic impacts should rank Richton lower. This commenter stated that Deaf Smith's ranking was based on impacts to agriculture, but that we currently have more agricultural land in production than needed. Another commenter suggested that ranking the Deaf Smith site higher than Davis Canyon on socioeconomic impacts was arbitrary because the discussion states that in-migration requiring mitigation will occur at both sites and that effects on agriculture, a major sector of the economy of Deaf Smith County, are possible. Two commenters objected that the DOE had failed to consider any of the most important socioeconomic impacts.

Response

Chapter 7 of the final EAs presents a revised discussion of the comparative evaluation against the socioeconomics guideline, including the reasons the Richton Dome site is believed to be slightly more favorable in terms of socioeconomic impacts than the Deaf Smith site and why it is expected that socioeconomic impacts would be most severe at the Davis Canyon site. For example, Chapter 7 explains why the potential for effects on community services is greater at the Richton Dome site than at the Deaf Smith site and why in-migration would exert more severe effects at Davis Canyon site than at Deaf Smith. Chapter 7 also discusses the agricultural industry near the Deaf Smith site as an important primary sector of the economy that supports significant employment and business sales. The DOE does not believe that the evaluation of potential socioeconomic impacts at the Deaf Smith site can be based on the amount of agricultural land in production in the United States.

The guideline on socioeconomics addresses the most significant impacts that may be induced by a repository. The favorable and potentially adverse conditions of that guideline were widely reviewed by the States, affected Indian Tribes, Federal agencies, and the public during the consultation process for the guidelines.

Issue

Many commenters objected that the 1980 data presented in the draft EA for the Davis Canyon site are out of date and lead to a misrepresentation of the potential socioeconomic impacts of locating a repository in the area. One commenter stated that housing is available in the area, the vacancy rate being 15 to 20 percent. Other persons said that the current unemployment rate reported by the Utah Department of Unemployment Security is 23 percent whereas the draft EA reports 7 percent. Another commenter noted that the area has an abundance of water to sell and that the sewage-treatment plant was built to accommodate an increase in populations, but the area has recently experienced a decrease in population. Similarly, several other parties noted that, whereas in 1980 the area's population was booming, the area is losing population. Others explained that Grand and San Juan Counties had experience in handling "boom" conditions and had successfully handled two uranium and one oil boom. Many commenters pointed out that the testimony at the public hearings in Utah and Texas showed that some residents of southeastern Utah feel that the socioeconomic impacts would be both favorable and manageable, while the residents of the Texas Panhandle believe that the socioeconomic impacts on the town of Vega and the general agricultural economy would be dramatic and severe. All of these commenters, therefore, suggested that the Davis Canyon site should be ranked higher on the socioeconomics guideline and at least above the Deaf Smith site.

Response

Having considered and evaluated the comments and the information included in them, the DOE has revised the discussion of milling operations in the area of the Davis Canyon site. The recent suspension of mining and milling operations in the area has caused local socioeconomic conditions to change, with currently greater housing availability, higher unemployment rates, lower

school enrollments, lower per capita incomes, and greater out-migration. Section 3.6 of the EA for Davis Canyon has been updated in regard to information on housing, personal income, unemployment rates, school enrollment, and the total population.

The DOE, however, does not believe that the Davis Canyon site should be considered more favorable than the Deaf Smith site for socioeconomic. Davis Canyon is still the only site where the analysis predicts significant repository-related impacts on community services, housing supply, and local government agencies in the affected area (see the evaluations of the sites against the first favorable and the first potentially adverse conditions of the socioeconomic guideline).

Issue

One commenter asked the DOE to clarify the first full paragraph on page 7-84. This paragraph, which discusses potentially adverse conditions for socioeconomic, states that "at Davis Canyon, water requirements are also not expected to adversely affect future development; however, this judgment is preliminary, as there is some uncertainty about potential short-term disruption of the area water supply during repository construction at this site." The commenter asked whether this statement implied disruptions of ground water at the site.

Response

The statement does not imply disruptions of ground-water systems at the site. The judgment is preliminary because it depends on the completion of two new reservoirs in the Blanding and Monticello areas. The San Juan Planning Council expects to build these two new reservoirs to take care of economic development needs and is willing to sell or lease part of its appropriations.

Issue

One commenter asked how the repository's effect on the High Plains aquifer in Texas would change if farmers move to dry-land crops or significant reductions in water use.

Response

Trends toward dry-farming could make the relative impact of withdrawing water for repository-related uses much more severe. The final EA does consider this trend and the potential for relatively more severe effects on water rights as well as consequent effects on future development near the Deaf Smith site.

Issue

One commenter recommended that the DOE use the disqualifying condition for the socioeconomic guideline to disqualify the Deaf Smith site; this disqualifying condition pertains to adverse impacts on water quality or quantity. The same commenter stated that, even if the DOE proceeded to rank the five nominated sites, it should not rank the Deaf Smith site as a preferred site.

Response

Because the DOE can mitigate or compensate for the adverse impacts on water quality and quantity, the Deaf Smith site is not disqualified on the basis of the socioeconomics guideline. The need to acquire water rights that could affect future development in the area was considered in the comparative evaluation of the five nominated sites against the socioeconomics guideline. The selection of preferred sites, however, depends on a comparative evaluation of the nominated sites against all of the siting guidelines.

C.3.4.2.2.3 Transportation

Issue

Several commenters stated that certain factors were not adequately accounted for in the relative ranking of the sites. Examples of such factors are cost, the emergency-response capabilities of affected States, and weather hazards. One commenter alleged that only distance was considered.

Response

All of the factors in the transportation guideline were considered during the comparative evaluation of sites. These factors include, but are not limited to, those mentioned by the commenters: cost, emergency-response capabilities, weather hazards, and distance. The evaluations of the favorable and potentially adverse conditions for each site in Section 6.2.1.8 of the final EAs discuss the information used to reach the findings on the guideline conditions.

Issue

Commenters noted that the draft EAs do not state what weight was given to the various conditions of the transportation guideline. It was also suggested that certain favorable conditions, such as cost and risk, should be weighted more heavily than others. These commenters contended that the DOE had stated publicly that national cost and risk would be weighted at half the total transportation ranking, but no similar statement is contained in published documents.

Response

The DOE agrees that national cost and risk should be weighted more heavily than the other factors in the transportation guideline. In the draft EA, the DOE considered national cost and risk (favorable condition 5 of the transportation guideline) to be weighted at 50 percent of the total importance of that guideline. A detailed explanation of the process used to evaluate the transportation conditions of the nominated sites for recommendation is contained in the multiattribute utility analysis of the nominated sites.

Issue

Several commenters expressed disagreement with the finding made by the DOE on the transportation-guideline conditions. They felt that, on the basis of the data presented, several of the findings for the favorable and potentially adverse conditions were unjustified. One commenter questioned that only the Richton site received a finding of "present" on favorable condition 5 (national cost and risk), and not Deaf Smith and Davis Canyon as well. Also noted were inconsistencies in the data for the various sites.

Response

Several of the findings for the favorable and potentially adverse conditions of the transportation guideline have been revised in the final EAs. These revisions are based on responses to public comments, additional data, and additional analyses. To ensure consistency among the sites for the guideline-condition findings, a common set of criteria was applied. The DOE believes that all the findings reported under the transportation guideline in the final EAs are valid at this stage of the site-selection process. The rationale for each finding for each condition is presented in Section 6.2.1.8 of the final EAs.

Some of the favorable and potentially adverse conditions require a comparison among sites, and hence only one site can receive a finding of "present." These conditions are so noted in Section 6.2.1.8 of the final EAs. For example, favorable condition 5 contains the phrase "which are significantly lower than those for comparable siting options"; for this condition, only one site--the site with the lowest costs and risks--can receive the finding of "present." It should be noted, however, that in the comparative evaluation of sites all available data for each site for each guideline condition were considered.

C.3.4.2.3 Ease and cost of siting, construction, and closure

Issue

A commenter questioned why the DOE did not rank the sites with respect to the system guideline on the ease and cost of siting, construction, operation, and closure. The commenter argued that a "ballpark" figure would be useful and implied that the DOE avoided this because the result would be unfavorable to the Hanford site.

Response

As explained in this appendix and in the EAs, only preliminary assessments of performance against the system guidelines are possible at present (i.e., before site characterization), and the DOE feels that the results of such preliminary assessments would be inappropriate as bases for site-selection decisions.

Issue

Another commenter pointed out that the way that the EAs report costs makes ranking the sites on this basis difficult. The use of reference cases does not allow the site-specific construction and lifetime costs to be considered. The commenter was critical of the DOE's estimates of uncertainty, pointing out that cost overruns on some nuclear projects have exceeded 100 percent.

Response

The cost estimates in the EAs were based on the estimates of the total-system lifecycle costs that the DOE prepares annually each year for submittal to Congress as part of the fee-adequacy report. The repository is not comparable to nuclear power plants, some of which have indeed experienced large cost overruns. Furthermore, the DOE is financially accountable to Congress, and the expenditures of the repository program are audited by the General Accounting Office.

C.3.4.2.3.1 Surface characteristics

Issue

Some commenters felt that the interpretation of the potentially adverse condition of the guideline on surface characteristics was inconsistent in the various EAs and that the sites that are subject to potential flooding were not evaluated equitably: the Hanford, Yucca Mountain, and Richton sites were given credit for flood protection through engineering measures, whereas the Davis Canyon, Lavender, Cypress Creek, and Vacherie sites were not given credit for flood protection.

Response

The DOE has decided that flood protection through engineering measures cannot be considered in evaluations against the potentially adverse condition of this guideline because by allowing credit for such flood protection the DOE would eliminate a discriminating condition for this guideline. As a result, the Hanford, Yucca Mountain, and Richton sites were given a finding of "present" for this condition.

Issue

Some commenters pointed out that the Davis Canyon site was penalized in two guidelines (transportation and surface characteristics) for the rugged terrain that would be traversed by the access road and railroad. This penalty could be avoided by locating the surface facilities eastward in the flats away from the cliffs.

Response

Each site must be evaluated against every guideline regardless of any apparent duplication of penalties for site conditions. The Davis Canyon site

contains rugged terrain; therefore, the favorable condition is not present. If the site is characterized, the plans for the layout of the surface facilities could be changed.

C.3.4.2.3.2 Rock characteristics

Issue

One commenter asked why the Hanford site was ranked lower on preclosure rock characteristics than the Deaf Smith and the Yucca Mountain sites.

Response

Since more exploration activity has occurred at the Hanford site than at the other sites, more data have been collected. Some of these data indicate that there are more conditions posing potential problems at this site than at the other sites. The conditions underground will not be adequately sampled until exploratory shafts have been sunk and underground excavations have been made at all sites.

Issue

One commenter asked whether a change in the buffer zone at Richton could change the degree of flexibility available at Richton and even require the use of a two-level design.

Response

Chapter 6 of the EA for the Richton Dome site has been revised to identify the assumptions and measurements made in claiming sufficient flexibility in preclosure rock characteristics. Several changes (not just the size of the buffer zone) could require the use of a two-level design at the Richton site.

Issue

One commenter questioned the Hanford site's being given a finding of "not present" for potentially adverse conditions 2 and 3.

Response

Chapter 6 of the EA for the Hanford site has been revised to explain the basis for these findings.

Issue

One commenter took issue with the small difference in rating between the Deaf Smith and the Davis Canyon sites for both preclosure flexibility and for ease of operation.

Response

Flexibility is only one of eight conditions considered in evaluating the sites on preclosure rock characteristics.

Issue

One commenter felt that the potential for high-pressure water inflow in regions of fractured rock will require "innovative engineering" and incur high costs at the Hanford site.

Response

The measures that would be required to mitigate these conditions are routinely used in mining. They are explained in Section 6.3.3.2.6 of the final EA for Hanford.

C.3.4.2.3.3 Hydrology

Issue

Several commenters questioned the appropriateness of the relative ranking of the five sites on the preclosure guideline on hydrology. One comment noted that the importance of the complexity of ground-water-control measures should not be equated with the potential for flooding or the availability of water. Another stated that the potentially adverse condition of ground-water conditions requiring complex engineering measures that are beyond reasonably available technology is present at Hanford, and therefore this site should be disqualified or heavily penalized in the relative ranking. A few comments stated that the relative rankings of Deaf Smith and Hanford were too favorable and should not be equal to those of Davis Canyon and Richton.

Response

As explained in Chapter 7 of the final EAs, the complexity of ground-water-control measures is indeed considered more important than the potential for flooding and the availability of water. The DOE does not agree, however, that the potentially adverse condition for the hydrology guideline is present at the Hanford site. The design features and construction techniques that would be used to minimize ground-water inflow into shafts and drifts at the Hanford site are based on mining experience under saturated conditions. The range of ground-water inflow conditions that are expected at Hanford can be accommodated with conventional design and construction methods; requirements for engineering measures beyond reasonably available technology are not expected. However, the relative complexity of ground-water-control measures at Hanford, as compared with the other sites, was taken into account.

Issue

One commenter noted that the Davis Canyon site was not correctly ranked on the hydrology guideline. Davis Canyon has enough flat land above the floodplain for construction and, unlike the other salt sites, has no large aquifers that require freezing for shaft sinking.

Response

The DOE agrees that, unlike the other two salt sites, the Davis Canyon site has no aquifers that require freezing for shaft sinking because only minor aquifers are present above the host rock. This favorable attribute was considered in the comparative evaluation of sites against the hydrology guideline. However, the location of the surface facilities of the repository is dictated by the need to mitigate visual aesthetic impacts to an acceptable level. Therefore, the DOE does not have the option of locating a repository at the Davis Canyon site on flat land above the floodplain.

Issue

One commenter felt that the finding for favorable condition 3, the availability of water required for repository construction, operation, and closure, should be changed to "not present" for the Davis Canyon site. The estimated water requirements for the project do not include the water needed for mitigation measures, such as site revegetation and water sprays to suppress dust. Moreover, purchasing existing water rights would foreclose uses dependent on existing water rights and would adversely affect new development in the area.

Response

The DOE has revised the table on repository characteristics in Chapter 5 of the final EA for the Davis Canyon site to clarify the water-resource requirements for the repository. The DOE acknowledges that withdrawal from the Colorado River, if this resource is used, would contribute to the increasing demand on the region's sparse water resources.

Issue

One commenter asked what preliminary data indicate that at the Deaf Smith site adequate quantities of water can be obtained from the Dockum Group.

Response

Well yields in the vicinity of the Deaf Smith site are in the range of 400 to 900 gallons per minute.

Issue

One comment noted that Yucca Mountain is not as favorable as the text suggests and that the difference between Yucca Mountain and the other sites is not substantial.

Response

With respect to the Yucca Mountain site, the ability to locate the repository in the unsaturated zone, where minimal measures for ground-water control will be required, minimal potential for flooding, and an ample supply of water at the site for repository siting, construction, operation, and closure are favorable for this site. It is not clear from the comment what features of the Yucca Mountain site were considered adverse by the commenter with respect to the favorable ranking on the hydrology guideline.

C.3.4.2.3.4 Tectonics

Issue

A number of commenters expressed concern that the DOE has not adequately considered all information in ranking sites on the preclosure guideline on tectonics.

Response

The comparative evaluations of sites in the draft EAs were based on the information available for the qualifying, favorable, and potentially adverse conditions as they influence the potential for ground motion and fault displacement. The final EAs more explicitly discuss the expected effects of earthquake ground motion and fault displacement for each site; the discussion is based on the evaluations.

Issue

Some parties questioned the evaluation of the Yucca Mountain site, particularly with respect to the potential effects of nearby faults and in-situ stress, the derivation of ground-motion estimates, and the potential use of NRC criteria for nuclear reactors (10 CFR Part 100, Appendix A).

Response

As discussed in Chapter 7 of the final EA, there are uncertainties about potential ground motion and the time of the last movement on faults near the site. However, these uncertainties are not so large as to preclude the findings that must be made at this stage of the site-selection process. The data needed for higher-level findings will be collected during site characterization.

The NRC has said that (see page 103 of the NRC comments on the draft EA for Yucca Mountain) "at the present time, it is premature to state that the design requirements for nuclear power plants are the same as those required for a waste repository. The DOE should consider stating at this time that the design requirements of structures important to safety will comply with 10 CFR 60 and appropriate EPA regulations." The DOE agrees and has never intended or stated that reactor criteria would or should be used. The DOE is developing an approach to determining the appropriate earthquake inputs for repository design. An annotated outline of this approach was sent to the NRC for comment on June 20, 1985.

No quantitative statements about earthquake probability and magnitude can be made at present on the basis of stress data. In deriving estimates of potential ground motion for Yucca Mountain, the DOE did not ignore the nearby faults, but did not explicitly consider each fault because the magnitude and the probability of earthquakes on these are not known. The DOE's judgments are based on the data base for strong ground motion and on the type and levels of ground motion that other facilities have been designed for.

C.3.4.3 Decision method

The method used to identify the preferred sites for recommendation, described in Section 7.4 and Appendix B of the draft EAs, elicited many comments. As already mentioned in the introduction to Section C.3.4, the DOE, in response to these comments, developed a more formal decision-aiding methodology that was reviewed by the National Academy of Sciences. A detailed description of this methodology is presented in the multiattribute utility analysis of the nominated sites, which also shows how the methodology was applied in terms of the siting guidelines. Thus, comments on the methodology applied in the draft EAs, the process used for identifying preferred sites, and the choice of preferred sites are not addressed here; only summaries of the various issues that were raised in these comments are presented in order to show the concerns of the commenters.

Among the comments was an objection to the statement in Section 7.1.2 of the draft EAs that "disqualifying conditions did not enter directly into the comparison of sites." This happened because the disqualifying conditions could not be used to discriminate between sites. Each of the potentially acceptable sites was evaluated against the disqualifying conditions (see Section 2.3 of the EAs), and no disqualifying conditions were found at any site. Had a disqualifying condition been found at any site, that site would have been removed from further consideration and would not have included in the evaluations of Chapter 7.

Many commenters said that the importance of individual guidelines in a group of guidelines should not be equal, and some suggested specific guidelines that should be considered more important than others in the same group. Some suggested that the importance of specific guidance should vary from site to site. These suggestions contradict the provisions of the implementation guidelines, which specify the relative importance to be assigned to each group of guidelines and state that, within a group, all guidelines are of equal importance.

The issues that were raised in the comments on the decision method are summarized below.

- The evaluation process described in Chapter 7 of the draft EAs is arbitrary and confusing.
- There is little correlation between the findings reported in Chapter 6 and the rankings in Chapter 7.

- The methodology is unsatisfactory, inadequate, undocumented, and biased. The averaging and the pairwise comparison methods are not satisfactory because the spread in rankings is artificially determined; the utility estimation method can be valid for comparisons against the preclosure guidelines but is not adequate for assessing postclosure performance.
- Aggregation procedures are valid only if the guidelines are complete and not redundant, but some guidelines are redundant (i.e., population is considered in the guidelines on population density and distribution, meteorology, environmental quality, socioeconomics, and transportation).
- The aggregation of rankings compounds the subjectivity of the application of the guidelines.
- Alternative decision methodologies might result in the identification of different sites as preferred for characterization.
- The methodology of comparison should be highlighted as a stand-alone issue.
- A sensitivity analysis should be performed and documented.
- The DOE should find a site adequate under the postclosure guidelines before considering its rank under preclosure guidelines.
- The aggregate ranking does not consider interactions among major factors.
- The weighting used for the various conditions of each guideline is not explained; hence the basis for the score on each guideline is not clear and cannot be replicated. Furthermore, if all conditions are of equal weight, then any one condition is not very important.
- The weighting of the postclosure guidelines with respect to the preclosure guidelines is too low and not justified.
- Because three postclosure guidelines cannot be used to discriminate among sites (climatic changes, erosion, and site ownership and control), the inclusion of these guidelines in the aggregate rankings reduces the weight assigned to the other postclosure guidelines.
- The weighting of 35:33:32 for the three groups of preclosure guidelines assigns similar weights to the three groups, contradicting the requirement of the implementation guidelines that the three groups be assigned a specified order of importance.
- Because the weighting was adopted without rulemaking proceedings, its use violates the public participation and rulemaking requirements of the Act, the DOE Organization Act, and the Administrative Procedures Act.

- Because the application of the methodology is contingent on the professional qualification and experience of the members of the evaluation team, the DOE should provide such information about every team member.

The DOE carefully considered these issues in the development and application of the decision-aiding methodology.

C.3.4.4 Miscellaneous comments on the nomination and recommendation process

The DOE received many comments that addressed various aspects of the process of site nomination and recommendation and the results reported in Chapter 7 of the draft EAs. Many of these comments approved of the sites identified as preferred for recommendation; one party submitted an independent evaluation that supported the choice of sites reported in Section 7.4. Many other commenters, however, disagreed with the sites identified as preferred. As already explained, the DOE developed a formal decision-aiding methodology for the ranking of sites. The results will be presented in the multiattribute utility analysis of the nominated sites and the recommendation of candidate sites, which are being issued separately.

Summarized and answered below are various other issues raised in comments on the nomination and recommendation process.

Issue

Some commenters said that four of the potentially acceptable sites should not have been excluded from the comparative evaluation in Chapter 7 because the exclusion of the four sites might have altered the outcome of the site rankings. Some parties also asked what happens to the four potentially acceptable sites that were not evaluated in Chapter 7.

Response

Section 112(b)(1)(E) of the Act requires each EA to include a reasonable comparative evaluation of the nominated site against the other sites and locations that have been considered. The siting guidelines (Section 960.3-2-2-3) require that the nominated site be evaluated against all other such sites. In this context "such sites" has been taken to mean other nominated sites. Therefore the comparative evaluation of sites against the guidelines considers the five sites proposed for nomination.

It is not true that the four remaining site have been excluded from a comparative evaluation against other potentially acceptable sites. As specified by the siting guidelines (Section 960.3-2-2-1), the selection of the preferred site in each geohydrologic setting that contains multiple sites was based on a comparative evaluation of the sites in that basin (see Section 2.4 of the EAs for the Davis Canyon, Deaf Smith, and Richton Dome sites).

The four sites not evaluated in Chapter 7 are not being recommended for characterization. They could, however, be considered again in the first-repository program if none of the characterized sites is accepted for repository development. They could also be considered in the second-repository program.

Issue

Commenters stated that the DOE should use the guidelines that do not require site characterization in selecting the preferred sites for characterization because the data are more available and more reliable. If this approach had been used, the rankings of the salt sites would have been different.

Response

The Act, in Section 112(b)(E)(i), requires that the sites be evaluated against all of the siting guidelines. Furthermore, many of the guidelines that require data from site characterization for the demonstration of compliance pertain to postclosure conditions that would affect the long-term safety of the repository.

Issue

A commenter applauded the DOE's use of conservative assumptions for preliminary performance assessments of the repository system and for present evaluations of potential environmental impacts, but suggested that the DOE should emphasize that actual repository performance at all sites is likely to be better than predicted because of these conservative assumptions. Commenters also noted that there are inconsistencies in the application of conservatism throughout the EAs.

Response

In its evaluations, the DOE used, where necessary, assumptions that approximate the characteristics or conditions considered to exist or expected to exist in the future at a site. These assumptions are realistic but conservative enough to underestimate the potential for a site to meet the qualifying condition of a guideline. The results of the analyses indicate that all of the sites are likely to meet the performance requirements. Given the limitations and uncertainty in the available information, statements that actual performance is likely to be better than predicted would be inappropriate. The DOE has attempted in the final EAs to ensure reasonable comparability among the sites in the degree of conservatism applied to similar analyses, such as ground-water-travel times.

Issue

Several commenters felt that nonconservative positions were taken when evaluating the sites against the guidelines in spite of a statement in Section 7.1.2 to the contrary. One commenter stated that a conservative assumption stated in Chapter 7, involving the vertical ground-water-travel time, was not implemented for the Davis Canyon site.

Response

The DOE feels that it has used conservative assumptions where insufficient data were available. It should be borne in mind, however, that at this stage in the site-selection process (i.e., nomination for site characterization) the qualifying and disqualifying conditions in the

guidelines need only meet the tests that evidence does not support a finding that the site is disqualified or does not support a finding that the site is not likely to meet the qualifying condition.

Regarding the specific comment, the conservative assumption stated in Chapter 7 involves a time of vertical travel through the interbeds in the evaporite sequence. Chapter 6 does not indicate that anything other than zero was used in estimating travel time through the interbeds when the total travel time through the evaporite sequence was estimated.

Issue

Commenters were concerned because the DOE did not rank the sites on the system guidelines. Some suggested that the DOE delay ranking the sites until enough data for performance assessments are available and repository technology is more developed.

Response

The DOE described the basis for site evaluations in Section 960.3-1-5 of the guidelines. This section indicates that comparisons between and among sites shall be based on the system guidelines to the extent practicable, and, if the evidence is not adequate to substantiate such comparisons on the basis of the system guidelines, then the comparisons shall be based on the groups of technical guidelines. As discussed in the EAs, the results of preliminary evaluations based on the system guidelines were presented in the EAs, but the objective was to demonstrate the status of capability at this point in the program, not to provide the basis for recommending sites for characterization.

The information needed to develop system performance assessments with sufficient confidence to use them for applying the system guidelines can be gathered only during site characterization. This fact, together with the schedule mandated by Congress for repository development, makes it imperative that the sites to be characterized be chosen expeditiously.

Consistent with the Act, the applicable NRC regulations in 10 CFR Part 60, and the DOE's siting guidelines, the DOE believes that it is appropriate and prudent to proceed with site characterization in order to obtain the information needed for selecting one site for development as a repository, advancing the designs of the repository and the waste package, and completing a license application to the NRC.

Issue

Some commenters criticized the data bases for the analyses presented in the EAs.

Response

The DOE has met the intent of the Act to use available information to recommend sites for characterization (see Section 112(b)(3)) and has been consistent with the guidelines in making the findings required for nomination and recommendation (10 CFR Part 960, Appendix III).

Issue

Several commenters expressed concern over differences in the data bases for different sites.

Response

The information available for the various sites is admittedly nonuniform in accuracy and extent. However, it meets the requirements of the Act and of the siting guidelines for this stage of the site-selection process. The detailed data needed for later decisions will be collected during site characterization.

Issue

One commenter stated that the DOE does not have sufficient data to compare the Deaf Smith site with the other four nominated sites. The commenter cited a lack of site-specific data in many technical areas.

Response

The DOE recognizes that the data used in comparing the sites are not uniform. However, the DOE feels the data are sufficient to choose the sites for nomination and recommendation for site characterization; meet the requirements of the Act and of the siting guidelines.

Issue

One commenter remarked that site selection for characterization is pointed toward ease of public acceptance rather than the technical quality of the site. The commenter pointed to the proximity of DOE facilities to two of the sites as evidence that prior public acceptance of DOE installations was a major consideration.

Response

The process to be followed in recommending sites for characterization is specified in the Act. Included in that process is evaluation against the siting guidelines. In this evaluation, each site must be shown likely to meet all of the technical guidelines. Public acceptance is not directly considered. (It is considered indirectly as part of evaluations against the socioeconomic guideline). The proximity of DOE installations to two of the sites is, at least in part, a consequence of a Congressional mandate to search for sites on Federal lands dedicated to nuclear activities. That search led to the Hanford and the Yucca Mountain sites.

Issue

One commenter said that, whereas the Act requires a comparative evaluation in an EA for each nominated site, Chapter 7 compares only five sites. Therefore, only those five can be among the sites finally nominated. The commenter said that to nominate any other site would require new draft EAs or EA supplements for that site and new comparative evaluations.

Response

While Chapter 7 only compares five sites, the comparisons of sites within each geohydrologic setting, when taken together with Chapter 7, provide a comparison of all nine sites. The procedure of comparing sites in each geohydrologic setting to identify sites for nomination and then performing a comparative evaluation of the nominated sites follows the requirements of the siting guidelines, Section 960.3. New draft EAs will not be necessary unless there is a change in the preferred sites within a geohydrologic setting.

Issue

One commenter noted that no worst-case analyses were done for the sites, but courts have ruled that such analyses are required for demonstrating compliance with the National Environmental Policy Act.

Response

The EAs for geologic repositories are prepared under the statutory requirements of the Nuclear Waste Policy Act rather than the National Environmental Policy Act.

Issue

Several commenters suggested considerations that should be given the greatest importance in site evaluations. One said that the potential for harm to the Canyonlands National Park outweighs all other considerations. Another felt that safety is the most important criterion, followed by cost. Another commenter listed geologic stability, absence of ground-water intrusion, simple and regular transportation routes, and the ability to maintain repository integrity in spite of social upheaval as most important.

Response

The siting guidelines require that primary consideration be given to the postclosure guidelines. These include guidelines devoted to safety (postclosure), geologic stability, ground water (geohydrology), and long-term repository integrity. Furthermore, the preclosure guidelines are divided into three groups: radiological safety; environment, socioeconomics, and transportation; and EAs and cost of siting construction, operation, and closure. Those groups are specified to be in decreasing order of importance as listed above. It can be seen that the siting guidelines provide considerable constraint in the weighing, or at least in ranking the importance of, different factors used in evaluating and comparing sites.

Issue

One commenter felt that Chapter 7 did not explain how the evaluation of the favorable and potentially adverse conditions in the guidelines were related to the rankings given the sites.

Response

The approach used in the comparative evaluation of sites in Chapter 7 of the draft EAs was explained in Section 7.1.2, which discussed, among other things, the relationship between the favorable and potentially adverse conditions and the site rankings. It explained that the favorable and potentially adverse conditions, considered on balance and in relation to the qualifying condition, constitute the basis for ranking the sites.

Issue

One commenter suggested that all of the sites be characterized.

Response

Because of its high cost, the characterization of all nine sites would be an imprudent and unnecessary use of the funds collected from utility ratepayers.

Issue

A number of commenters stated that the waste should be disposed of at its point of origin and that the DOE should weigh regional considerations in siting the repository. Approximately 80 percent of the waste to be stored in a West Coast repository is generated east of the Mississippi, yet no States in the east are being considered for a repository.

Response

Among the nine sites found to be potentially acceptable for the first repository, and the five sites nominated as suitable for characterization is Richton Dome, which is in the State of Mississippi. In addition, the DOE is investigating potential repository sites in the north-central, northeastern, and southeastern regions. The study is investigating crystalline rocks of the eastern Appalachian region, but it was not sufficiently advanced to allow a crystalline-rock site to be included in the site-selection process for the first repository. The crystalline-rock program will be part of the effort to select a site for the second repository.

The Act requires consideration of regionality in selecting the second repository. Therefore, if the first repository is located in the west, the second repository may be located in a region closer to eastern nuclear power plants. However, it is important to remember that all sectors of the society benefit from nuclear power, either directly or indirectly, through the distribution of electrical power and decreases in the consumption of foreign and domestic oil. Therefore, the disposal of radioactive waste is a national problem. Although a State may not have a nuclear power plant within its boundaries, it is very likely that the State is, or will be in the future, consuming electricity produced by nuclear power plants outside the State. The paramount consideration in siting the repository is public health and safety, which cannot be sacrificed solely to ensure a regional distribution of repositories. If all host rocks and sites in the eastern United States were found unsuitable, then no repositories would be sited there.

Issue

Commenters were critical of the ability of DOE officials to make unbiased decisions. Some stated that political issues interfered with the site selection process. Specific concerns were stated as follows:

- Secretary Hodel's statements in Texas during the Congressional election race of Phillip Graham may have influenced site-selection decisions.
- The EAs were released one month after the election, rather than before, when they would have been a campaign issue. The commenter alleged that the schedule is being driven by politics.
- Political pressure may be brought to bear on the DOE to change the ranking of nominated sites. Several commenters felt that the residents of small towns and sparsely populated regions near the nominated sites do not have enough political clout to affect the choice of sites.
- Political and socioeconomic considerations should not outweigh safety and environmental considerations. Many commenters stated that the choice of Hanford was influenced by economic conditions in the region, and one commenter suggested that the government may be considering paying off the WPPSS bond in exchange for the State of Washington's agreement to locate the repository at Hanford. Other commenters stated that both the Yucca Mountain and the Hanford sites were recommended for characterization because, as federally owned sites, these would be less public opposition to these sites.

Response

Recognizing that the selection of a geologic repository should not be subject to political pressure, Congress specifically directed the DOE to issue guidelines to be used in selecting sites for a repository and specified the process to be used in site selections. The nomination and recommendation of sites for characterization were based on evaluation of the sites against the guidelines.

Former Secretary of Energy Donald Hodel did campaign in Texas on behalf of Representative Phillip Graham during the Congressional election of 1984. During that campaign, Secretary Hodel expressed his personal view that Mr. Graham would effectively represent Texans in the repository-development process. However, Secretary Hodel's participation in the 1984 campaign did not influence the evaluation of the potentially acceptable sites in the EAs. The identification of the Deaf Smith County as a preferred site for characterization was a technical decision that was not influenced by political considerations in view of the widespread opposition to a repository in Texas.

The collection and analysis of data for nine draft EAs was a complex and time-consuming process. The schedule was driven by the requirement of the Act for the DOE to prepare environmental assessments that include specific evaluations and analyses; the timing of the election had no influence on the schedule.

The DOE released the draft EAs for public comment and held briefings and hearings in the affected States. The DOE carefully considered the issues raised by individuals, public interest groups, States and Indian Tribes, and other Federal agencies submitted in writing or as testimony in the hearings. The DOE is confident that all citizens had ample opportunity to comment on the EAs. Any change in the rankings of the nominated sites would be due to additional data leading to changes in guidelines findings, and not to political pressure.

The guidelines are structured to ensure that the protection of health and safety is heavily weighted in selecting sites for characterization. In no way do the economic conditions in an area override considerations of health and safety.

The Hanford site's close proximity to the WPPSS project has no influence on its nomination or recommendation for site characterization. The WPPSS program is an entirely separate program, and there has been no "tradeoff" agreement with the State of Washington.

While the DOE did initially look at Yucca Mountain and Hanford sites as part of its program to screen Federally owned sites, this is not the basis for nominating or recommending these sites for characterization. Each of these sites has been evaluated against the guidelines and has been found suitable for site characterization.

Issue

Some commenters observed that the draft EAs do not prove that the DOE has chosen the best sites for nomination and characterization. One commenter requested that the DOE repeat the ranking process for the nine potentially acceptable sites after site characterization completed, to make sure that the three sites characterized are the best sites.

Response

It is not necessary to choose the best sites for nomination and characterization; it is necessary to choose sites that are likely to meet all applicable regulatory requirements for the protection of public health and safety and would allow the geologic repository program to proceed in an expeditious and cost-effective manner.

REFERENCES FOR SECTION C.3

- American Physical Society, 1978. "Report to the American Physical Society by the Study Group on Nuclear Fuel Cycles and Waste Management," in Reviews of Modern Physics, Vol. 50, No. 1, Part II.
- Brunton, G. D., and W. C. McClain, 1977. Geological Criteria for Radioactive Waste Repositories, Y/OWI/TM-47, Office of Waste Isolation, Union Carbide Corporation, Oak Ridge, Tenn.
- Christiansen, R. L., and P. W. Lipman, 1965. "Geologic Map of the Topopah Spring NW Quadrangle, Nye County, Nevada," U.S. Geological Survey Quadrangle Map GQ-444, scale 1:24,000, Washington, D.C.
- Comptroller General of the United States, 1979. The Nation's Nuclear Waste--Proposals for Organization and Siting, EMD-79-77, General Accounting Office, Washington, D.C.
- DOE (U.S. Department of Energy), 1980. Final Environmental Impact Statement--Waste Isolation Pilot Plant, DOE/EIS-0026, Washington, D.C.
- DOE (U.S. Department of Energy), 1981. Site Performance Criteria, National Waste Terminal Storage Program, NWTS-33(2), Office of Nuclear Waste Isolation, Columbus, Ohio.
- DOE (U.S. Department of Energy), 1982. Program Objectives, Functional Requirements, and System Performance Criteria, National Waste Terminal Storage Program, NWTS-33(1), Office of Nuclear Waste Isolation, Columbus, Ohio.
- DOE (U.S. Department of Energy), 1983. Record of Responses to Public Comments on Proposed General Guidelines for Recommendation of Sites for Nuclear Waste Repositories, DOE/RW-0001, Washington, D.C.
- DOE (U.S. Department of Energy), 1984. "General Guidelines for the Recommendation of Sites for the Nuclear Waste Repositories," Title 10, Code of Federal Regulations, Part 960, Federal Register, Vol. 49, No. 236, p. 47714.
- DOE (U.S. Department of Energy), 1985. Mission Plan for the Civilian Radioactive Waste Management Program, DOE/RW-10005, Washington, D.C.
- EPA (U.S. Environmental Protection Agency), 1977. "Environmental Protection Standards for Nuclear Power Operations, Title 40, Code of Federal Regulations, Part 190, Federal Register, Vol. 42, p. 2860.
- EPA (U.S. Environmental Protection Agency), 1982. "Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," Title 40, Code of Federal Regulations, Part 191, Federal Register, Vol. 47, p. 58196.

- EPA (U.S. Environmental Protection Agency), 1985. "Environmental Standards for the Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes," Final Rule, Title 40, Code of Federal Regulations, Part 191, Federal Register, Vol. 50, p. 38066.
- House of Representatives, 1979. Congressional Record--House, October 18, 1979, H9367.
- IAEA (International Atomic Energy Agency), 1977. Site Selection Factors for Repositories of Solid High-Level and Alpha-Bearing Wastes in Geologic Formations, Technical Report 177, Vienna, Austria.
- Lipman, P. W., and E. J. McKay, 1965. "Geologic Map of the Topopah Spring SW Quadrangle, Nye County, Nevada," U.S. Geological Survey Quadrangle Map GQ-439, scale 1:24,000, Washington, D.C.
- NAS-NRC (National Academy of Sciences-National Research Council), 1957. The Disposal of Radioactive Waste on Land, Report of the Committee on Waste Disposal, Division of Earth Sciences, Publication 519, Washington, D.C.
- NAS-NRC (National Academy of Sciences-National Research Council), 1970. Disposal of Solid Radioactive Wastes in Bedded Salt Deposits, Committee on Radioactive Waste Management, Washington, D.C.
- NAS-NRC (National Academy of Sciences-National Research Council), 1978. Geological Criteria for Repositories of High-Level Radioactive Waste.
- NRC (Nuclear Regulatory Commission), 1960. "Standards for Protection Against Radiation," Title 10, Code of Federal Regulations, Part 20, Federal Register, Vol. 25, p. 10914.
- NRC (Nuclear Regulatory Commission), 1980. "Advance Notice of Rulemaking on Technical Criteria for Regulating Geologic Disposal of High-Level Radioactive Waste," Title 10, Code of Federal Regulations, Part 60.
- NRC (U.S. Nuclear Regulatory Commission), 1983. "Disposal of High-Level Radioactive Wastes in Geologic Repositories--Technical Criteria," Final Rule, Title 10, Code of Federal Regulations, Part 60, Federal Register, Vol. 48, p. 28194.
- Sinnock, S., and J. A. Fernandez, 1982. Summary and Conclusions of the NNWSI Area-to-Location Screening Activity, NVO-247, Nevada Operations Office, U.S. Department of Energy, Las Vegas.
- Sinnock, S., Y. T. Lin, and J. P. Brannen, 1984. Preliminary Bounds on the Expected Postclosure performance of the Yucca Mountain Repository Site, Southern Nevada, SAND84-1492, Sandia National Laboratories, Albuquerque, N. Mex.
- Snyder, D. B., and H. W. Oliver, 1981. Preliminary Results of Gravity Investigations of the Calico Hills, Nevada Test Site, Nye County, Nevada, USGA-OFR-81-101, Open-File Report, U.S. Geological Survey, Denver, Colo.

Swadley, W. C., D. L. Hoover, and J. N. Rosholt, 1984. Preliminary Report on Late Cenozoic Faulting and Stratigraphy in the Vicinity of Yucca Mountain, Nye County, Nevada, USGS-OFR-84-788, Open-File Report, U.S. Geological Survey, Denver, Colo.

C.4 DATA BASE, PROPOSED ACTIVITIES, REPOSITORY DESIGN

This section addresses comments on the accuracy or adequacy of baseline information about the repository system, site characterization activities, and the site itself, that is used to evaluate site suitability and the impacts of developing the site. It includes almost all comments on Chapter 3 and on sections 4.1, 4.3, and 5.1 of the Environmental Assessment.

C.4.1 BASELINE CONDITIONS AT THE SITE

This category introduces subsequent discussion regarding baseline conditions at the site. General comments will be dealt with here; specific comments are addressed in later sections. One comment received in this category stated that fault activity, volcanism, and hydrothermal activity, ground-water travel-time calculations, free drainage of host rock, ground-water chemistry of the unsaturated zone, and other hydrologic and geochemical issues suggested that there may be significant problems in licensing because all of the issues are related directly to the isolation capability of the site. It was stated that these baseline conditions are adverse to the isolation capability of the site and cannot adequately protect the environment or the health and safety of the public. It was also suggested that Section 3.1 be revised to clearly state that Yucca Mountain is not on the Nevada Test Site.

Response

Analyses addressing the above topics in Chapter 6 of the Environmental Assessment (EA) show that no present evidence suggests that the Yucca Mountain site will not meet isolation requirements. It should be noted that the U.S. Department of Energy has taken the position that varying degrees of confidence are appropriate at different steps in the site selection process. Appendix III of 10 CFR Part 960 (1985) defines the findings for both qualifying and disqualifying conditions that are required at the time of selection of potentially acceptable sites, at nomination and recommendation of a site as suitable for characterization, and when repository site selection is made. The recommendation as suitable for site characterization is to be based on "... available evidence, evaluations, and resultant findings for the guidelines ..." (10 CFR 960.3-2-2-5, 1985).

During site characterization, additional site data, laboratory studies, and mathematical modeling will address the list of concerns cited in this comment, and extensive interactions with the Nuclear Regulatory Commission and the State of Nevada will help to establish when the degree of information is approaching that which will satisfy the appropriate regulations.

Section 3.1 of the EA accurately portrays Yucca Mountain's location as being immediately adjacent to the Nevada Test Site.

C.4.1.1 Geologic conditions

This category addresses 67 comments and questions on the accuracy or adequacy of the baseline geologic conditions at the Yucca Mountain site. Because of the large number of comments received in this category, and the variety of subjects that the category covers, it has been divided into five issues, as follows: (1) Regional Stratigraphy and Structure, (2) Site Stratigraphy and Structure, (3) Seismicity, (4) Mining and Mineral Resources, and (5) Miscellaneous.

Issue: Regional stratigraphy and structure

Twenty-two questions were asked relating to this issue. Many commenters contended that the draft Environmental Assessment (EA) did not adequately discuss either the regional fault zones in Nevada and southeastern California, specifically the Walker Lane and Las Vegas shear zones, or the structural deformation near these zones that has been triggered by nuclear explosions. A few commenters stated that the relationship between fault length and earthquake magnitude is a relatively reliable indicator of the expected size of future earthquakes. Statements in the draft EA were questioned regarding Quaternary fault displacements within 20 kilometers (12 miles) of Yucca Mountain as being represented by "... a few very small degraded scarps less than a meter or so in height." Also questioned was the statement that no "unequivocal" offsets younger than about 40,000 years old have been identified along faults near the site.

Several commenters questioned conclusions that volcanic and tectonic activity at Yucca Mountain and other parts of the Great Basin have decreased over the past 10 million years. Some commenters stated that the Basin and Range is geologically the most unstable region in the United States. Finally, the statement in the draft EA that most cores of mountain ranges are composed of granite and gneiss more than a billion years old was challenged by one commenter.

Response

A more detailed discussion of the fault systems in southern Nevada (particularly the left-lateral offsets throughout this region) has been added to the final EA. The intent of Chapter 3, however, is to provide the reader with a synopsis of the geologic setting of the region in which Yucca Mountain lies. Chapter 6 contains the details from which the descriptions in Chapter 3 were derived.

Many of the comments received, such as requests for more information on the regional stress regime, will be addressed during site characterization. Present information, however, indicates that explosion-induced aftershocks are all within about 14 kilometers (9 miles) of the detonation, whereas Yucca Mountain is more than 40 kilometers (25 miles) from the nearest underground tests. Figures contained in the draft EA have been updated on the basis of the most recent fault map of the Yucca Mountain area. This map, prepared by Scott and Bonk (1984), was unavailable when the draft EA was prepared.

It is true that the relationship between fault length and earthquake magnitude has been demonstrated for some earthquakes in the United States for which historic information exists. However, determining fault length for poorly exposed or relatively old faults is a subjective process and could lead to erroneous estimates of future earthquake magnitudes.

It is true that Quaternary displacements along the Bare Mountain Fault at distances greater than 20 kilometers (12 miles) from the site exceed 1 meter (3 feet). Although the statement in the draft EA is accurate, it could be misleading and has therefore been modified in the final EA. Several other text revisions in the final EA regarding fault displacements have been made on the basis of documents that were prepared concurrently with the draft EA. The statement in the draft EA regarding no "unequivocal" fault offsets younger than 40,000 years has been modified in the final EA to read "Where age constraints have been inferred from radiometric dating and from stratigraphic correlations of faulted and unfaulted deposits at a trenched site, no offset younger than about 40,000 years has been demonstrated. Holocene offset has not been demonstrated in the study area nor can it be ruled out." In addition, recently available but unevaluated thermoluminescence dates may indicate on the order of 1 to 10 centimeters (0.39 to 3.9 inches) of fault displacement in eastern Crater Flat more recently than 6,000 years ago (Dudley, 1985).

The text of the draft EA states clearly in several places that volcanism and tectonism have continued in south-central Nevada during the past 10 million years, but at a reduced rate compared to pre-10 million years ago. Many geologists have concluded that during the past 10 million years, volcanic and tectonic activity have gradually shifted toward the east and west margins of the Great Basin. Viewed as a whole, it cannot be denied that the Basin and Range is one of the most tectonically active regions in the United States, although parts of the Basin and Range, such as the Yucca Mountain region, have probably remained relatively stable for many millions of years.

The paragraph in the draft EA describing the core of mountain ranges and the age and extent of crystalline rocks has been modified in the final EA.

Issue: Site stratigraphy and structure

Sixteen comments were made regarding this issue. Most of the commenters stated that the discussion in the draft EA of the site geology omitted many topics such as a discussion of the northeast-trending faults at the site and slickensides found in a core at the site; conflicting data on the geologic history and stability of the site; the fractured nature of the rocks overlying the potential host rock in regard to possible venting of gases from the repository; the possible presence of low-angle detachment faults beneath Yucca Mountain; the degree of certainty associated with estimated fault displacements at the site; and the definition of a "moderately sized fault" as applied to the Ghost Dance Fault.

Other comments concerned inaccuracies in the description of the genesis of tuff at the site, and noted that the most recent references on calderas and caldera-forming eruptions were not used. Finally, a few commenters

claimed that the thicknesses reported in the draft EA for some formations were inaccurately reported from source references, and that Figure 2-3a (Schematic cross sections portraying the geologic complexity surrounding Yucca Mountain) in the draft EA should show the caldera in Crater Flat.

Response

The final EA contains the most current information on faults that may affect the construction and operation of a repository at Yucca Mountain. The source of this information is a map that was published by the U.S. Geological Survey (USGS) at the same time that the draft EA was issued (Scott and Bonk, 1984).

It is true that volcanism and faulting have continued at or near Yucca Mountain during the past 11 million years. The conclusion that the site is relatively stable on the basis of field evidence, however, is not inconsistent with the sentence above. Field evidence reported by Rogers et al. (1983) indicates that faults at Yucca Mountain have not had significant movement in at least the last 500,000 years, although the orientation of certain faults suggests that slip in the present-day stress regime is possible. Site characterization studies to be conducted at Yucca Mountain will investigate why faults have been stable for such a long period of time, and what the likelihood is that these faults will become active in the future.

The venting of gases described by one commenter has on occasion occurred shortly after nuclear explosions. Because a repository at Yucca Mountain would be located in the unsaturated zone, the possibility of vapor transport of waste elements exists. Only the noble gases such as xenon, krypton, or radon; carbon as carbon dioxide; tritium as H₂ gas or as water vapor; or iodine as I₂ vapor are possible waste elements that can be transported as gases or vapors. The aqueous phase in the unsaturated zone, however, can retard the movement of some of these waste elements because they are soluble in liquid water. Fractures in the rock above the repository horizon should have no bearing on the release of gaseous radionuclides from the repository principally because the waste will be sealed inside stainless steel waste disposal containers for hundreds of years. After about 300 years, most of the gaseous radionuclides will have decayed to nonradioactive products. This subject will be the object of intensive study during site characterization.

The possibility that low-angle detachment faults occur beneath Yucca Mountain will be investigated during site characterization. Because of the widespread occurrence of these structures in the Basin and Range, it would not be surprising if they were detected below Yucca Mountain.

The description of the Ghost Dance Fault has been modified in the final EA to reflect information that became available concurrently with the release of the draft EA. In brief, the Ghost Dance Fault dips steeply to the west, and has about 25 meters (82 feet) of displacement (USGS, 1984).

The description of the genesis of tuff and calderas has been modified on the basis of references suggested by the commenter.

Errors in the thicknesses of stratigraphic units have been corrected in the final EA. Illustration of an inferred caldera in Crater Flat on the cross section in Figure 2-3a (Schematic cross sections portraying the complexity surrounding Yucca Mountain) in the draft EA is inappropriate because the position, depth, and lateral extent of the Crater Flat Caldera are unknown. Illustration of an inferred caldera in the plan-view map on Figure 3-3 (Southern end of southern Nevada volcanic field showing location of calderas in the vicinity of Yucca Mountain) of the draft EA is shown with a question mark, indicating the uncertainties described above.

Issue: Seismicity

Fifteen questions were asked relating to this issue. Several commenters stated that seismic activity along the Pahranaagat Shear Zone, and the Mine Mountain, Rock Valley, and Frenchman Flat fault zones (including focal depths), should be discussed in the final EA. Commenters questioned the U.S. Department of Energy (DOE) assumption that faults at Yucca Mountain are inactive and that the peak ground acceleration at the site is most likely to be 0.4g. A few commenters asked how the Walker Lane and Las Vegas shear zones could impact the project. Several commenters asked why the site was considered to be outside the bounds of the southern Nevada East-West Seismic Belt, and at the same time was included in a zone of "major seismic risk" on a map published by the USGS (1984). Finally, a few commenters questioned whether the design of structures at Yucca Mountain could withstand the maximum estimated earthquake in this area, and requested a discussion of what would happen to the surface and subsurface facilities in the event of a large earthquake. One commenter questioned the purpose of the dots on Figure 3-9 (Historical seismicity in the western United States) of the draft EA.

Response

The fault and shear zones mentioned in the comment are chiefly north-east trending, left-lateral fault zones of Tertiary age. In the preliminary calculation of maximum ground accelerations at Yucca Mountain from an earthquake, the fault zones noted in the comments were considered. However, the greatest impact on the site was predicted for the Bare Mountain Fault, which is approximately 6 kilometers (4 miles) closer to Yucca Mountain than the closest of the above-mentioned faults (USGS, 1984). Information on focal depths for recent earthquakes in this region is contained in a report by the USGS (1984).

Calculation of 0.4g as the probable peak acceleration at the site under the assumption that faults in the immediate vicinity of Yucca Mountain are not active is explained in the USGS (1984) report. This calculation required a listing of faults that were thought to present the greatest hazard to the site for which a reliable fault length could be estimated. Then, assuming a full-length rupture of these faults, the likely maximum magnitude for the earthquake was estimated from empirical relationships between fault length and earthquake magnitude. Peak accelerations at the site due to each event then were estimated using attenuation curves and the shortest distance to the site. This is the analysis that resulted in identification of the Bare Mountain Fault, as noted earlier in this section. Although current thinking

is that some faults in the immediate vicinity of Yucca Mountain are oriented so that slip is possible in the present stress field, the confidence in fault lengths is not sufficient to estimate magnitudes at this time. See Section C.8.4 and EA Section 6.3.3.4.5 for a description of the procedure to be followed to establish seismic risk for repository design purposes.

Possible earthquakes associated with the Walker Lane and Las Vegas shear zones will be evaluated quantitatively during site characterization. Additional information on regional and local seismicity from USGS (1984) has been added to Section 3.2.3 of the final EA. Carr (1984) suggests that activity along these zones has slowed considerably in the southern Great Basin during the past 10 to 14 million years.

It is true that the draft EA did not specify why Yucca Mountain was placed outside the southern Nevada East-West Seismic Belt. The placement of this boundary is very subjective and it has been removed from Figure 3-9 (Historical seismicity in the western United States) in the final EA. Calculations of maximum accelerations do not depend on a precise location of this boundary. The assignment by the USGS (1984) of this part of Nevada to a "major seismic risk area" represents a broad analysis of overall seismic hazards in the United States, including regions of very limited seismicity. The seismic hazards of small areas within broad high-risk areas also may be lower, as the data for Yucca Mountain thus far indicate.

The design of a repository at Yucca Mountain will require extensive studies and reviews with the Nuclear Regulatory Commission (NRC) to determine the appropriate seismic-design requirements for facilities in this region. The NRC has not yet written standards for the design of geologic repositories with regard to seismic considerations. Analyses of potential effects on pre-closure repository operation and postclosure repository performance from earthquakes or faulting will be conducted during site characterization. The reader is also referred to Section C.8.4 for further discussions of tectonics considerations.

Figure 3-9 of the draft EA and the accompanying description have been modified to explain the dots, which indicate the centers of previous seismic activity.

Issue: Mining and mineral resources

Seven comments were made relating to this issue. Several commenters noted that mineral exploration has been banned at the Nevada Test Site (NTS) for the past 30 years. They indicated that an adequate evaluation of the mineral resources potential could, therefore, not be made solely with a literature review of past exploration and mining activities, such as Bell and Larson (1982). These commenters suggested that geochemical surveys should be conducted and that additional references should be cited in the EA. One commenter argued that there are insufficient data to conclude that Yucca Mountain does not contain commercially attractive geothermal resources. Finally, a few commenters pointed out that the Bare Mountain district, west of Yucca Mountain, contains the largest fluorite mine in Nevada, and that the gold reserve estimates for the Stirling-Panama mine reported in the draft EA are five times too small.

Response

The DOE is aware of the large mineral deposits west of the site in the Bare Mountain district. On the basis of current resource-accumulation models and the information currently available for Yucca Mountain, the site has a low potential for metallic mineral resources. This conclusion is based on the following information:

1. Mineral inventories were conducted by literature review (Bell and Larson, 1982) and by combined literature review and field investigation (Quade and Tingley, 1983). The results indicated that there is no evidence of past mining activity at Yucca Mountain nor any evidence of existing economic mineralization. A number of drill holes at and near the site support the conclusion of no economic mineralization. Results also indicated that there are no economically significant non-metallic mineral deposits located at Yucca Mountain.
2. Field exploration and geologic mapping was conducted by the USGS (Christiansen and Lipman, 1965; Lipman and McKay, 1965; Scott and Bonk, 1984) for Yucca Mountain and surrounding areas. No evidence of economic mineralization was reported or mapped.
3. Exploratory boreholes at and near the Yucca Mountain site have been drilled. Cores and cuttings derived from those boreholes are routinely analyzed by geochemical methods for the Nevada Nuclear Waste Storage Investigations (NNWSI) Project. No mineralization has been found of economic importance. A sample from drill hole USW G-1 taken at 1,072 meters (3,515 feet) below the surface showed "... an abrupt increase in the intensity of alteration, presumably caused by hydrothermal solutions ..." (Spengler et al., 1981). An analysis of the sample showed that it contained 0.64 ounce per ton silver and 0.02 ounce per ton gold (reported as parts per million in the reference). These concentrations are not economical at the surface, let alone at a depth of 550 meters (1,800 feet) below the water table.

Drill holes at Yucca Mountain are up to 1,829 meters (6,000 feet) deep. Thermal gradients measured in these boreholes suggest that economically attractive (emphasis added) high-temperature waters are unlikely to occur at Yucca Mountain. Furthermore, geothermal systems that have some potential for development generally are associated with siliceous magmas (or their volcanic products) that are less than 2 million years old. The caldera systems at and near Yucca Mountain are between 11 and 15 million years old.

The final EA has been modified to acknowledge that widespread fluorite mineralization in the Bare Mountain district is judged to be of local significance (Bell and Larson, 1982). A reference supporting the comment that gold reserves at the Stirling-Panama mine are about 10,000 pounds has not been found; the final EA has been changed to read: "Reserves have not been reported by the mine operators of the Stirling-Panama mine, but Bell and Larson (1982) estimate ore reserves in excess of 100,000 tons at a grade of about 0.3 ounces of gold per ton of rock."

Issue: Miscellaneous

Seven comments were assigned to this issue. One commenter stated that there are substantial, though unstated, uncertainties in the quantitative models used in the draft EA to evaluate the suitability of the site, as well as uncertainties in the geotechnical data upon which these models rely. Not identifying these uncertainties, contend the commenters, leads to overly optimistic findings relative to the guidelines. Another commenter stated that heat-induced dehydration of zeolites was not discussed in Chapter 3 of the draft EA. A discussion of soil conditions was requested by one commenter, who argued that wind and water erosion are, in part, a function of soil type. Several commenters found typographical errors and errors in conversion from the English to the metric system. Finally, one commenter requested that a letter from URS/John A. Blume and Associates to Science Applications International Corporation, regarding the design and construction of nuclear facilities in tectonically active areas, be included in the references for the EA, and that a copy of the letter be made available to the State of Nevada for its review.

Response

A more complete consideration of uncertainties in geologic models and the information used to develop these models has been included in the final EA. In some cases where reasoned judgment and opinions were used, the text has been modified to indicate the subjectivity of the interpretations and the uncertainty of the opinions. It is noted, however, that by making conservative assumptions at several points in an analysis, the conservatism may in fact be multiplied several times, resulting in an overly pessimistic or unrealistic finding in regard to the suitability of the site for a waste repository.

Possible heat-induced dehydration of zeolites is described in Section 6.3.1.2 (Geochemistry). Chapter 3 discusses only the baseline geologic conditions at the site, not the effects that a repository may have on the rock.

Because of the arid climate and resultant low water availability in southern Nevada, soil development in this region has been limited. During site characterization, however, soil conditions will be studied for the purposes of siting the surface facilities and eventual reclamation. Studies to determine the potential effects of wind and water erosion will also be performed.

All errors pointed out by reviewers (typographical and conversions from the English to the metric system) have been corrected in the final EA. The letter referred to by the comment (from John A. Blume and Associates to Science Applications International Corporation) is not a reference and is therefore not included in the final EA. However, this letter has been made available to the State of Nevada.

C.4.1.2 Hydrologic conditions

Comments addressing hydrologic conditions were assigned to the categories of: (1) Surface Water, (2) Ground Water, and (3) Current Use, and are addressed below.

C.4.1.2.1 Surface water

This category addresses four comments on the accuracy or adequacy of the baseline surface-water conditions at the Yucca Mountain site. The comments were assigned to two issues: (1) Floods and Flood-plains and (2) Clarifications.

Issue: Floods and flood-plains

Two commenters stated that sheet wash and channel runoff can cause considerable damage to surface and subsurface facilities in the desert southwest and that these processes should be considered during siting of surface and subsurface facilities at Yucca Mountain.

Response

It is true that sheet wash and channel runoff can be expected during severe storms at Yucca Mountain. Each will be considered in the siting and design of the exploratory shaft and the repository. The maximum probable flood expected in this area will be determined during site characterization; this is the design flood to which American National Standards Institute standards will be applied in order that the repository and associated facilities may comply with safety standards as recommended by the Nuclear Regulatory Commission in Regulatory Guide 4.17 (NRC, 1982) or other requirements as established. Due to the potential for sheet wash, the potentially adverse condition related to flooding of the surface and underground facilities (Section 6.3.3.1) has been changed to present.

Issue: Clarifications

Two comments were made on this issue. One commenter argued that statements pertaining to internal drainage in the Great Basin are incorrect and cited the Colorado River as an example of external drainage. Also questioned were statements in the draft Environmental Assessment (EA) about the Great Basin's "limited agricultural potential." Finally, one commenter suggested that Figure 3-11 (Drainage basins in the Yucca Mountain area showing direction of flow of surface water) of the draft EA could be made clearer by minor editorial and drafting modifications.

Response

The Colorado River drains part of the Basin and Range province. Yucca Mountain, however, lies within the Great Basin, a segment of the Basin and Range defined as having internal surface drainage.

The potential for agricultural development in Nevada may be large assuming that sufficient amounts of water are applied to the land. It is true that crop yields for some crops in parts of Nevada have been large. However, because of Nevada's overall arid climate and relatively poor soil conditions, agricultural production has not been significant compared to many other parts of the nation.

The final EA includes the changes suggested for Figure 3-11 in Section 3.3.1 of the draft EA.

C.4.1.2.2 Ground water

This category addresses the accuracy or adequacy of the baseline ground-water conditions at the Yucca Mountain site. The 36 comments received were assigned to the following issues: (1) Direction of Ground-water Flow, (2) Ground-water Travel Time, (3) Recharge at the Site, (4) Ground-water Supply and Availability, and (5) Miscellaneous.

Issue: Direction of ground-water flow

Thirteen comments were made on this issue. Several asked the U.S. Department of Energy (DOE) to discuss in more detail ground-water movement through and between aquifers, along fault zones, and through interstitial pores. One commenter stated that fracture flow in the welded-tuff and lava-flow aquifers requires that zeolites be present along these fractures to retard migration of radionuclides; otherwise, bedded tuff would be more advantageous to use as a host rock.

Several of the commenters stated that there is an extreme lack of information about ground-water movement in the Basin and Range, especially the delineation of ground-water basins in southern Nevada and the relationship among these basins, the deep carbonate aquifer beneath Yucca Mountain, and the springs at Ash Meadows and Death Valley.

One commenter asked that the DOE discuss more fully the likelihood of discovering minor aquifers in the vicinity of the site and their relation to other aquifers in the area. Information was also requested regarding aquifer size, recharge rates, and production potential of all regional aquifers.

Other commenters requested that the DOE discuss vertical mixing among aquifers, in view of the possibility that the deep carbonate aquifer could be used as a water source in the future. Information was also requested on the potential to contaminate water in Well J-13 which could be the water source for the repository.

Finally, one commenter requested that the distance between recharge and discharge points be stated in the discussion in Section 2.1 of the draft Environmental Assessment (EA).

Response

The discussion of ground-water movement along faults at Yucca Mountain (Section 6.3.1.1) has been modified to be consistent with the exact wording in Montazer and Wilson (1984). Studies to date indicate that ground water beneath Yucca Mountain flows to the southeast and south and discharges at Alkali Flat, and possibly near Furnace Creek in Death Valley. This ground-water basin, referred to as the Alkali Flat-Furnace Creek Ranch ground-water basin, is thought to be separate from the Ash Meadows ground-water basin which supplies water to Ash Meadows.

The unit evaluation report (Johnstone et al., 1984) established that both zeolitized and non-zeolitized rock units considered as candidates for a potential host rock would be suitable. However, the greater distance of the Topopah Spring Member from the water table gives it an advantage in terms of travel time. It is also clear that the presence of zeolitized rock units below the repository horizon is an advantage when flow paths are likely to be oriented vertically downward.

Because hydraulic head pressure is higher in the carbonate aquifer than in overlying tuffaceous rocks (at least in Well UE-25p#1), water from the tuff aquifer cannot enter the carbonate aquifer. It is also stressed that the repository is above the water table. Much additional work will be conducted during site characterization to investigate if other aquifer areas occur. That fact, and the estimated ground-water travel time from the repository to the water table (even assuming it does occur; Section 6.3.1.1.5), would preclude contamination of water in Well J-13.

Minor aquifers or perched water tables do occur in the Yucca Mountain region. The water would be expected to drain rapidly during excavation. Moreover, it is highly unlikely that large aquifers remain undiscovered in and near the Nevada Test Site because of the extensive drilling programs that have been conducted in this region during the past several decades. A thorough summary of the known regional hydrology is presented by Waddell et al. (1984).

Approximate distances between recharge and discharge points can be estimated from Figure 2-5 (Location of Yucca Mountain site with respect to the basins of the Death Valley ground-water system), where the ground-water basins are illustrated schematically.

Issue: Ground-water travel time

Two comments were received on this issue. One commenter suggested that rapid water flow along fractures near the repository to wells in the region (if it occurs) could be determined by tritium injection and later water analysis. Another commenter suggested a modification to the executive summary in regard to ground-water travel time.

Response

Some tritium analyses have been conducted (Benson et al., 1983) and more will be conducted during site characterization using samples from well water and from any perched water zones found during construction of the exploratory shaft. Tritium injection plans remain to be finalized.

The Executive Summary has been revised to accurately reflect the information in the final EA.

Issue: Recharge at the site

Thirteen comments were received on this issue. Many commenters questioned the annual recharge rate at Yucca Mountain by noting that the available data base is inadequate to support the DOE estimated percolation of 1 millimeter (0.04 inch) per year. Some of these comments suggested that the uncertainty of these estimates be stressed in the final EA. Another commenter suggested that recharge along fractured tuffaceous rocks during intense storms could be very high.

Response

The estimate of flux at Yucca Mountain is not a direct measurement, since there is no water removal from drill holes within the unsaturated zone, as explained by Montazer and Wilson (1984). It was derived by measuring the in situ potential gradient and effective permeabilities from core samples and using these to estimate flux. Several tests are planned during site characterization to better understand infiltration and to determine the amount of flux in the host rock. Section 6.3.1.1.5 has been expanded to include a discussion on the range of flux rates that are considered reasonable at Yucca Mountain. In this regard, however, information from Czarnecki (1985), Rush (1970), and specifically Montazer and Wilson (1984) and Montazer et al., (1985) indicate that less than 0.5 millimeter (0.02 inch) per year is currently passing through the proposed repository host rock (the Topopah Spring Member).

Issue: Ground-water supply and availability

Two commenters questioned the production potential of the aquifers in the site area (including the deep carbonate aquifer) by noting that little information is provided on the potential future use of these aquifers for domestic and irrigation resources. Another commenter questioned why the DOE did not evaluate possible reductions in the discharge of water at springs in Ash Meadows that might be caused by repository development at Yucca Mountain.

Response

With regard to production potential, the final EA includes a discussion of the wells that are extracting water from the Alkali Flat-Furnace Creek Ranch ground-water basin. Much of the irrigation in the Amargosa Valley south of Yucca Mountain is provided by springs that discharge along or near faults that bring water from the deep carbonate aquifer to the surface. It does seem possible, however, that exploitation of deep aquifers throughout

Nevada could occur at some point in the future, assuming that the shallow aquifers are eventually depleted. The likelihood that the relatively small Alkali Flat-Furnace Creek Ranch ground-water basin would be exploited for its water will be evaluated during future studies.

With respect to Ash Meadows, it is correct that in Chapter 3 the DOE did not evaluate possible reductions in the discharge of water at springs in Ash Meadows caused by repository development at Yucca Mountain. This is because springs at Ash Meadows discharge from a different aquifer and could not be affected by activities at Yucca Mountain. Section 5.2.2 of the final EA, however, does describe the hydrologic impacts that could be expected from development of a repository at Yucca Mountain. Moreover, as stated in Section 5.2.2, "... the aquifers underlying Yucca Mountain can produce an abundant quantity of ground water for long periods of time without lowering the regional ground-water table ..." (Thordarson, 1983).

Issue: Miscellaneous

Six comments were received on this issue. One commenter stated that much of the information about the Alkali Flat-Furnace Creek Ranch ground-water basin is speculative because hydrologic testing will not begin until the site is already in the characterization stage. Thus, conservative ground water travel times for the site cannot be confidently estimated. Another commenter pointed out errors in the text of Chapter 3 concerning an historical review of ground-water studies in this area. Several commenters found an error in Table 3-3 (Dual classification of Tertiary volcanic rocks at Yucca Mountain) and on the identical Table 6-16 of the draft EA. A last commenter asked that the basins be referred to in terms of the Hydrologic Basins delineated by the State of Nevada Engineer.

Response

A major, regional ground-water study of the Yucca Mountain area has already been completed by Waddell (1982) and a summary of studies is given in Waddell et al. (1984) and the results are included in the EA. Although much has already been learned about the hydrology of Yucca Mountain, much more information will be gathered during site characterization. Ground-water travel times reported in the final EA reflect the range of uncertainty of the available data.

The comment about inconsistencies in the historical review of ground-water studies in this area is partly correct. Yucca Mountain was not placed within the Ash Meadows ground-water basin by Winograd and Thordarson (1975) as stated in the draft EA, but rather in their Oasis Valley-Fortymile Canyon basin. This has been corrected in the final EA. Basin designations were revised by Waddell (1982) and Yucca Mountain was placed in the Alkali Flat-Furnace Creek Ranch ground-water basin.

The reversal of stratigraphic order of the Pah Canyon and Yucca Mountain members in tables 3-3 and 6-16 of the draft EA has been corrected in the final EA. With regard to accurate designation, the one used by Waddell (1982) and Waddell et al. (1984) represents the most recent interpretation by the U.S. Geological Survey.

C.4.1.2.3 Current use

This category addresses comments on the accuracy or adequacy of the baseline conditions in the Yucca Mountain area concerning current water use. The 15 comments were assigned to the following issues: (1) Water Use, (2) Water Demand, and (3) Water Rights.

Issue: Water use

Six questions were asked on this issue. Several commenters stated that the U.S. Department of Energy (DOE) could have estimated water use (irrigation and domestic) in the Amargosa Valley by indirect methods, including LANDSAT images. Other commenters stated that up-to-date figures for water use in the Amargosa Desert ground-water basin (including the acreage under irrigation) are available from the State of Nevada. A few commenters stated that although the draft Environmental Assessment (EA) pointed out that the ground-water table in the Ash Meadows area has declined because of irrigation pumping, there is no discussion of the impact of the declining water table on the DOE proposed water supply for the repository. Moreover, there is no discussion of the impact to local water users from ground-water pumping at Yucca Mountain.

Response

Although various indirect methods for estimating water use in the Amargosa Valley could have been used, a study by the State of Nevada was selected. After the draft EA was prepared, a study of water use in the Amargosa Desert ground-water basin, as designated by the State Engineer, was issued by the Nevada Department of Conservation and Natural Resources (Coache, ca. 1984). The Amargosa Desert ground-water basin, as designated by the State Engineer, draws its water from the Alkali Flat-Furnace Creek Ranch ground-water basin, and from the Ash Meadows ground-water basin. Agricultural water use in the Amargosa Desert designated ground-water basin was estimated to be 9,105 acre-feet in 1983. Industrial, commercial, and quasi-domestic water use was estimated to be 1,070 acre-feet in 1984. From well log data, non-permitted pumping for domestic use is estimated to be 400 acre-feet per year (Coache, ca. 1984). Thus, the estimated water use in the Amargosa Desert designated ground-water basin in 1984 (assuming that agricultural water use was not significantly different from 1983 to 1984) was about 10,575 acre-feet. This information is included in the final EA.

Drawdown of the ground-water table discussed in Chapter 3 refers to the Ash Meadows ground-water basin. On the basis of current information, Yucca Mountain lies within a separate basin referred to as the Alkali Flat-Furnace Creek Ranch ground-water basin. Ground-water pumping at Yucca Mountain is therefore not expected to have any affect on water users in the Ash Meadows basin, nor will water use in the Ash Meadows basin have any affect on the water supply for the repository.

Issue: Water demand

Four questions were received in this area asking that the final EA consider various growth patterns in southern Nevada in terms of future water needs and potential utilization, especially considering that a future Las Vegas could obtain water from the lower carbonate aquifer near Yucca Mountain. Other commenters stated that because specific water requirements for the project were not included in the draft EA, potential impacts such as regional drawdown or contamination to future water supplies cannot be evaluated. Finally, one commenter stated that the title to Section 3.3.3 (Present and projected water use in the area) is misleading because there is no assessment of future water needs in this section.

Response

The ground-water basin in which Yucca Mountain lies is called the Alkali Flat-Furnace Creek Ranch ground-water basin and is relatively small; it ranges from approximately 32 to 64 kilometers (20 to 40 miles) in width and is approximately 161 kilometers (100 miles) long. Ground water discharges from this basin at Alkali Flat and near the Furnace Creek Ranch in Death Valley. All analyses to date indicate that part of the Amargosa Valley is in an adjacent basin known as the Ash Meadows ground-water basin. Ground waters in the two basins are not connected. Development and operation of a repository at Yucca Mountain is not likely to have impact on future developments in the Amargosa Valley. Furthermore, in 1979 the Nevada State Engineer designated, or formally recognized the presence of, the Amargosa Desert Ground-Water Basin (Newman, 1979), which placed issuance of new water permits on a preference basis rather than a prior-appropriation basis (Morros, 1982). Consumptive use of ground water for irrigation was ruled not to be a preferred use in this basin.

It is possible that an expanding population in southern Nevada may eventually exploit other ground-water basins in Nevada. It would be very unlikely, however, that future water needs for the City of Las Vegas would lead to exploitation of a ground-water basin as small as the Alkali Flat-Furnace Creek Ranch ground-water basin when basins that are larger and closer to Las Vegas are available.

Estimates of the water requirements for the repository are included in the final EA. A qualitative evaluation of water use in the Alkali Flat-Furnace Creek Ranch ground-water basin is included in the final EA by comparing the expected water use at the repository with other water users in this area. The DOE retains its preliminary conclusion that ground-water pumping at the repository will not cause a regional drawdown of the water table. This conclusion is based on records for 18 years of pumping of Well J-13, which is the well that is being considered as a possible water source for the repository (see Section 6.3.3.3). Additional studies conducted during site characterization will help predict future water demand in the Alkali Flat-Furnace Creek Ranch ground-water basin.

Issue: Water rights

Six comments were made on this issue. One commenter stated that because Yucca Mountain is not a Congressionally established "reservation," the final EA should contain a discussion of unappropriated water, citing that Nevada law requires the State Engineer to reject new applications for water rights for any purpose where there is no unappropriated water. It was also questioned whether the DOE has the necessary water rights for a repository at Yucca Mountain. Another commenter wanted to know if the DOE currently has water rights from Well J-13, and if so, what the limitations are on these rights.

Response

If it becomes necessary to acquire privately held water rights for the repository, a situation not expected based on available information, the DOE would purchase these rights or begin Federal condemnation proceedings. Such negotiations or proceedings are not expected or planned. Because no existing privately held rights or encumbrances have been identified at the site, the DOE considers that the qualifying condition has been met. Whether superior rights to the water in the same underground source exist with respect to points of extraction outside the Nevada Test Site has not yet been determined.

C.4.1.3 Environmental conditions

Comments addressing environmental conditions were assigned to the categories of (1) Land Use; (2) Ecosystems; (3) Air Quality and Weather; (4) Noise; (5) Aesthetic Resources; (6) Archaeological, Cultural and Historical Resources; and (7) Background Radiation. These subject areas are addressed below.

C.4.1.3.1 Land use

The baseline land-use section of the Environmental Assessment (EA) presents the existing situation in the region with respect to land use. Also presented is a discussion of projected developments in the area, based on available data and information. A number of comments were received in this category, and these have been aggregated to the following issues: (1) Land Withdrawal, (2) Agricultural Concerns, (3) Future Development, and (4) Mineral Resources.

Issue: Land withdrawal

Eleven comments were received on the issue of land withdrawal for the repository and railroad spur. Most commenters questioned the large amount of land to be withdrawn (50,000 acres), and requested information on how such a withdrawal would proceed. Some also asked that the area of land to be

withdrawn be illustrated. The same commenters also requested that the total required acreage for the repository be identified.

Response

The total required controlled acreage for the repository is 24,710 acres. This area includes Bureau of Land Management (BLM), Nevada Test Site, and Air Force lands. The BLM portion, which is the portion that would have to be withdrawn, is approximately 5,000 acres, not 50,000. The EA text has been corrected in several places to reflect this change.

At present a rail corridor through BLM lands is only one of three options being studied for the repository program. If a corridor were to be sited through BLM lands, the land may consist of a simple right-of-way rather than withdrawal of many acres solely for that purpose. Regardless, detailed studies of competing land uses will be done during site characterization and in conjunction with the Environmental Impact Statement process.

Issue: Agricultural concerns

Five comments addressed this issue. Several commenters claimed that the EA neglected to address the effects of the project on prime farmland or on farmlands of statewide importance. Another commenter noted that desert soils are among the most fertile soils and that productivity is limited primarily by the availability of water. Also mentioned was the possibility that Federal activities involving shipments of highly radioactive materials through the State of Nevada could result in the contamination (and therefore loss of use) of large tracts of range or agricultural lands.

Response

The Yucca Mountain site does not contain prime farmland or farmland of statewide importance as defined in the Farmland Protection Policy Act. Possible impacts to lands adjacent to transportation corridors are discussed in Section 5.3.2 of the EA. While it is true that water is the most limiting factor to desert land development, nutrient content of soil is also an important factor in agricultural land development. Since nutrient content at the Yucca Mountain site is low, these lands are not considered conducive to agricultural development.

Issue: Future development

Seven commenters addressed future development concerns, and asked that the EA discuss in greater detail topics such as State and local land-use regulations (regarding incorporation, annexation, zoning, flood plain control), infrastructure planning, construction design, and so on. Two of the commenters also asked that the EA include more information on the timing and size of sub-division developments planned for Ash Meadows and Pahrump Valley. A "future-oriented" water-use analysis related to projected developments was also requested.

Response

It is too early in the planning process to incorporate future developments, such as local subdivision expansion, and infrastructure data because the data will change in the next five years as the Environmental Impact Statement is developed and studies associated with it are implemented. Site characterization and repository activities will comply with all applicable State and local land-use regulations. Further, multiple-use priorities will decrease once the site becomes a controlled area.

Issue: Mineral resources

The discussion of land use for mining activities in the area of the site was considered inadequate by two commenters, since it refers only to the present condition, and does not address the future potential for mineral exploration and extraction.

Response

It is beyond the scope of this EA to predict future mineral exploitation; only the current situation can be described. At present, no economically exploitable resources exist in the Yucca Mountain area. A detailed discussion of the resource potential of the area is presented in Section 6.3.1.8 of the EA.

C.4.1.3.2 Ecosystems

The comments discussed in this category questioned the description of the baseline ecosystem and the description of the floral and faunal communities presented in the draft Environmental Assessment (EA). Five comments were received in this area, and they are subdivided into three issues: (1) Threatened or Endangered Species, (2) Revegetation, and (3) Mixed Transition Plant Association.

Issue: Threatened or endangered species

Three commenters expressed a concern that the threatened and endangered species listing cited in the EA was incomplete. Both the Mojave fishhook cactus and the desert tortoise were given as candidates for addition to such a listing.

Response

Information gathered during a literature review, during intensive site-specific surveys, and through discussions with the U.S. Fish and Wildlife Service indicated that no listed threatened or endangered species occur in the study area, and accordingly, Federal protection under the Endangered Species Act of 1973 (USFWS, 1973) is not appropriate in this area. Both the Mojave fishhook cactus and the desert tortoise are candidates under review but have not yet been officially added to the list of federally protected

species. Should their status change, the DOE will take the appropriate steps required under the Endangered Species Act. The desert tortoise is also a State-protected, "rare" species. The text in Section 3.4.2.3 of the final EA has been revised to indicate the above condition.

Issue: Revegetation

One commenter questioned how much "organic activity" would be contained in topsoil that was disturbed and banked for 25 to 30 years.

Response

Topsoil that is removed during site characterization will not be banked for 25 to 30 years; rather, it will be stored only for the short amount of time that an exploratory hole is in operation (all site characterization activities are to be completed within 4 to 5 years), and then used for the reclamation and restoration of exploratory holes. Longer-term revegetation procedures for the repository will be investigated during site characterization. "Organic activity" of soil may be measured in several ways. All soil, whether disturbed or undisturbed, undergoes aging and chemical transformations. It is not anticipated that soil banking will significantly affect the potential of the banked soil to be used in reclamation activities.

Issue: Mixed transition plant association

One commenter noted that the description of the mixed transition plant community was described only in terms of absent species, and that the description would benefit through the inclusion of dominant species names, general description of the community, and reference to bordering communities and associated transitional zones.

Response

The text of Section 3.4.2.1.4 of the final EA has been changed to provide a more detailed description of this community. However, because of the highly variable nature of the plant association, it is difficult to describe or quantify it in exact terms.

C.4.1.3.3 Air quality and weather

The 13 comments that address this category have been divided into four issues: (1) Meteorological Data Collection, (2) Precipitation and Evapotranspiration, (3) Climate, and (4) Fugitive Dust.

Issue: Meteorological data collection

Four commenters questioned the adequacy of the baseline data base for meteorological and air-quality conditions in and around the proposed repository site. For example, it was felt that not enough information was

provided on diffusion climatology and potential ambient air-quality levels in the area of the Yucca Mountain site. It was further suggested that information on wind speed, wind direction, atmospheric stability, and interference with national ambient air-quality standards be provided. As a consequence, the text of these comments also questioned the evaluation of the effects on air quality from such things as the release of radionuclides.

Response

The baseline evaluation and description of meteorological conditions presented in the draft Environmental Assessment (EA) were based on data from sites around the proposed repository site because site-specific data were not available. The onsite program was initiated by Sandia National Laboratories to aid in the design of heating and air conditioning systems for the surface facilities, not to provide the data required to adequately assess diffusion climatology at the site. Furthermore, the data collected by Sandia were not available in a referenceable form.

The air-quality analysis presented in Chapter 5 of the draft EA specifically excluded radionuclide emissions and their subsequent impacts. Radiological impacts are discussed in sections 5.2.9 (Radiological effects) and 6.4.1 (Preclosure radiological safety assessments) of the draft EA. These impacts, however, are not compared to limits set forth in 40 CFR Part 61 because Subpart H of 40 CFR Part 61 excludes the U.S. Department of Energy facilities that are regulated under 40 CFR Parts 190, 191, or 192. The repository at Yucca Mountain would comply with conditions set forth in 40 CFR Part 191 (Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes, 1985), rather than 40 CFR Part 61.

Environmental documents published subsequent to the EA, such as the Environmental Impact Statement (EIS), will evaluate in detail the impacts associated with the various aspects of development of Yucca Mountain as a repository. At that time, impacts due to waste transportation and commuter traffic and potential interference with attainment of national ambient air-quality standards will be evaluated in greater detail. Presently, the collection of data on transportation routes, transportation modes (truck, train, or both), and several other aspects of the project have not been completed. Additionally, complete onsite meteorological and air quality data will be available at the time the EIS is prepared.

Issue: Precipitation and evapotranspiration

Four commenters questioned the annual average evapotranspiration and precipitation rates presented in the EA, and the statement in the EA that annual precipitation averages one-third of evapotranspiration. Postulated extreme event and antecedent moisture conditions were thought to be more meaningful than average precipitation and evapotranspiration.

Response

Records for Yucca Flat show monthly data as well as annual averages so that variability in moisture conditions can be predicted. For climate and air-quality modeling that will be part of site characterization, additional

site-specific meteorological data will be available, and details of annual variations in precipitation and evapotranspiration will be understood. General understanding of these values for the arid southwestern United States will also be useful for comparing site data and improving predictive capability.

For the draft EA, potential evapotranspiration was estimated by an empirical method (the Thornthwaite method) reviewed in Rosenberg (1974). Potential evapotranspiration for Yucca Mountain has been estimated to be about 0.6 meter (2 feet) per year. No reference was cited for the evapotranspiration value contained in the comment. Estimates in Craig and Robison (1984) suggest 1 to 1.5 meters (3.5 to 5 feet) of potential evapotranspiration. The U.S. Geological Survey, in its comments on the draft EA, states that potential evapotranspiration is between 1.8 and 2.4 meters (6 and 8 feet) per year. Either of these estimates is consistent with the estimates of precipitation that are 20 percent or less of annual potential evapotranspiration as reported at the end of Section 6.3.1.1.3 of the draft EA. These estimates are preliminary and speculative, and the final EA has been revised to reflect this uncertainty. The climatic regime will be studied in more detail during site characterization.

The EA was modified to reflect new studies by Claassen (1983) which suggest that infiltration may be limited to pluvial and near-pluvial conditions and that current recharge is very limited, even at higher elevations.

Issue: Climate

Three commenters addressed the adequacy of the data presented in the draft EA and the validity of the interpretation of that data in accurately assessing long-term climatic effects on the repository. Extrapolation of climatic conditions at Yucca Flat to higher elevations at Yucca Mountain were not considered appropriate.

Response

A review of alternative interpretations of Pleistocene climates has been added to the final EA. An indication of the points for which agreement has been reached, or where there is no consensus among recognized experts, has been included to provide balance to the discussion of paleoclimates. If Yucca Mountain is selected for further consideration as a repository, data needed to fully characterize the diffusion climatology and meteorology of the site will be collected during site characterization.

Issue: Fugitive dust

Two commenters expressed concern that the baseline meteorological and air quality conditions at the site were such that development activities associated with the repository (clearing of land, travel over unpaved roads) would reduce the effectiveness of particulate-control strategies (e.g., the aridity of the area would make watering unpaved roads for dust control impractical).

Response

Although the climate of the area could require that special consideration be given to control strategies proven effective in similar meteorological conditions, the inherent weather conditions would not prevent reasonable, effective particulate control. Watering not only controls the dust as long as the surface is wet, but also helps in compacting loose particles and cementing them into the surface as it dries. It also washes fine particles (which are more likely to be suspended) down into the road surface. Commercially available dust-control chemicals can be mixed with the water to aid in more thorough wetting of the surface and to inhibit particulate emissions.

C.4.1.3.4 Noise

This category concerns the data on existing noise conditions presented in Chapter 3. The one comment received in this category asked whether the ambient noise levels estimated in the draft Environmental Assessment (EA) for rural communities and desert areas will be confirmed.

Response

The only way in which the estimated ambient noise levels presented in the EA can be confirmed is through a monitoring program. The conduct of such a program is outside the scope of activities allowed during the assessment of existing information about Yucca Mountain.

The subject of ambient noise levels will be addressed during the Environmental Impact Statement process, and a decision will be made as to the type and extent of studies to be conducted. If monitoring is deemed necessary, a plan will be developed at that time.

C.4.1.3.5 Aesthetic resources

This category concerns the data on existing aesthetic resources presented in Chapter 3; one comment was received. The commenter questioned if more discussion should be provided on visibility and if a view-shed analysis should be performed.

Response

The final Environmental Assessment was changed to explain that some facilities may be visible from U.S. Highway 95, especially at night when facilities are lighted. Additional visibility and view-shed analyses may be conducted during the Environmental Impact Statement process.

C.4.1.3.6 Archaeological, cultural, and historical resources

This category addresses the baseline description of archaeological, cultural, and historical resources found in the vicinity of the proposed study area of Yucca Mountain. The 15 comments were grouped into the following issues: (1) Sufficiency of Data, (2) Consultation with Other Organizations, (3) Site Comparison, and (4) Bibliography.

Issue: Sufficiency of data

Seven comments were received which pointed to a perceived lack of data in several areas. First, it was felt that the final Environmental Assessment (EA) should reference the planning and procedural steps of legislative mandates in the compliance process and should discuss the results of 1984 test excavations (including methodology and intensity level). This and other comments asked that the significance of the sites and their eligibility for listing on the National Register of Historic Places be presented in the final EA. In a related observation, one commenter suggested that the EA describe all site significance with reference to the Archaeological Element for the Nevada State Historic Preservation Plan (1982). Another commenter was concerned that the Tule Springs Archaeological District was not mentioned in the EA. Finally, it was requested that historic cultural resources be discussed in greater detail.

Response

With respect to the archaeological sites surveyed in the area, a table has been prepared and added to the text of the EA (Section 3.4.6) which lists all sites and their eligibility status. The Tule Springs site is indeed cited in the referenced report, contrary to the commenter's impression.

Field survey methodology and survey intensity have been outlined in specific technical reports and are not considered appropriate for inclusion in the EA. However, Section 3.4.6 of the EA has been amended to reference the Nevada Historic Preservation Plan (1982).

Issue: Consultation with other organizations

Five comments were received under this issue; all addressed or requested that consultation procedures with other organizations be initiated as soon as possible. These organizations are as follows: the National Park Service (Western Region), the Nevada State Historic Preservation Office (SHPO), the Advisory Council for Historic Preservation, and Native American groups. The U.S. Department of Energy (DOE) was asked to coordinate with the State Department of Conservation and Natural Resources on the number of test units to be placed in each site, and on the site survey selection itself.

Response

This concern will be addressed by the establishment of a Programmatic Memorandum of Agreement between the DOE, the Nevada SHPO, and the Advisory Council on Historic Preservation. Such a Memorandum of Agreement will also prevent future disagreements on site selection and site survey procedures. With regard to Native Americans, no affected Indian Tribe has been identified

at the site; however, should such an identification be made, the appropriate Tribal Council will be contacted, advised, and consulted. In addition, archaeological reports prepared under the auspices of this project will, whenever possible, be sent to the National Park Service as requested.

Issue: Site comparison

One commenter noted that the number and types of prehistoric sites in the Yucca Mountain vicinity suggest that the area has experienced more than casual or transient occupation. The commenter requested that the type and quantity of archaeological findings on and near Yucca Mountain be compared with those of other areas of the State.

Response

Yucca Mountain was probably never heavily occupied, as its archaeological record reflects the remains of nomadic hunters and gatherers who rarely stayed very long in any one area. Archaeological site density at Yucca Mountain is greater than that recorded for the Yucca Flat area, situated 48 kilometers (30 miles) northeast of Yucca Mountain (Reno and Pippin, 1985), but is much less than that recorded for the Pahute and Rainier Mesa areas, situated 48 kilometers (30 miles) to the north (Pippin, 1986). Regardless of the specific site density, the archaeological record at Yucca Mountain does have the potential, as outlined in the EA, to address questions important in understanding the prehistory of Nevada.

Issue: Bibliography

Four commenters filed questions regarding the bibliographic record; the first noted that it seems as if very little in the cited literature was derived from historical sources. Another identified a reference that was cited in the text, but not found in the bibliography (Pippin and Zerga, 1983). The last commenter asked that a specific report be cited in the bibliography.

Response

Historical references are noted in Section 3.4.6 of the final EA, and the Pippin and Zerga (1983) reference is included in the final EA bibliography. The last report requested is an unpublished report prepared for the DOE, Nevada Operations Office, by URS/John A. Blume and Associates (Kensler, 1981). It is entitled "Survey of Historic Structures; Southern Nevada and Death Valley." It is important to note that this last report concentrated only on standing historic structures that had been previously recorded and did not involve cultural resource surveys. Other historical assessments of the region are underway. It has been reviewed during preparation of the final EA.

C.4.1.3.7 Background radiation

The comments in this category concern the background radiation data presented in Chapter 3. Seven comments were received. Five commenters noted

that the site may already be unsafe due to radiation in the soil from nuclear weapons testing. Another commenter questioned the definition of background radiation levels. The levels of radioactivity in Yucca Mountain ground water were also questioned.

Response

At present, the Yucca Mountain site is deemed to be uncontaminated from Nevada Test Site (NTS) activities. However, the contribution of NTS activities to the baseline radiation environment will be determined during site characterization. Soil will be tested for contamination. Workers would not be allowed in areas where contamination levels exceed applicable standards unless stringent precautions were used (e.g., protective clothing and monitoring).

In the context used here, radiological background refers to the baseline radiological conditions resulting from all sources (i.e., artificial as well as natural). This includes penetrating radiation from the earth's crust and cosmic sources, primordial radionuclides and their decay products, and radioactivity deposited in the area from previous activities at the NTS or from atmospheric nuclear testing on a global scale.

The level of radioactivity in Yucca Mountain ground water will be determined during site characterization. The general ground-water flow pattern is illustrated in Figure 6-2 (Maps of the Yucca Mountain site) of the draft EA. The flow tends to be toward the south or southeast under Yucca Mountain. No radionuclides other than tritium were present in detectable concentrations in NTS wells. The "other radionuclides" mentioned in the draft EA were measured in wells in New Mexico as part of the Environmental Protection Agency's off-site monitoring program for formerly utilized underground test areas. The text has been revised to specify tritium as the only detectable radionuclide in NTS wells.

C.4.1.4 Transportation

Twenty-seven comments were received in the transportation category and these were divided into the following issues: (1) Highways, (2) Railroads, and (3) Miscellaneous.

Issue: Highways

Ten comments were assigned to this issue. More specific existing and projected local highway data for communities in Clark and Nye counties, regional data for Nevada, and interstate data were requested. Two commenters suggested that the many trucks coming into Nevada would greatly increase the chance for an accident, and asked what provisions had been made for scheduling regular driver stops, and for accommodating unscheduled stops due to weather or other emergency conditions. Another commenter requested more traffic count data for U.S. Highway 93 to Arizona, Interstate 15, and local roads. One commenter asked why Table 3-8 (Traffic service levels and characteristics) was included in the draft Environmental Assessment (EA). In a related comment, it was asked whether project-related studies will consider

the cumulative effect that growth in outlying areas may have on the existing transportation network. Another commenter asked if any consideration had been given to providing access to Yucca Mountain through the northeast side of the Nevada Test Site (NTS), thus allowing more repository and workers to reside in Lincoln County.

Response

The request for more site-specific data will be addressed in the Environmental Impact Statement. Site-specific data will be provided for each proposed and alternative road and rail route. The U.S. Department of Energy (DOE) will comply with all applicable laws, regulations, and codes pertaining to the shipment of radiological and nonradiological materials. A brief overview of such regulations is contained in Appendix A of the final EA. Some additional specific data along postulated regional routes is provided in Chapter 5 of the final EA.

The comments on Chapter 3 concerning impacts and mitigation were addressed in Chapter 5 and Appendix A of the draft EA. Regardless, it must be emphasized that transportation impacts and mitigation will be evaluated in the Environmental Impact Statement. This will include the concern regarding growth in outlying areas and subsequent strain on the existing transportation network.

The trucks that bring waste to Nevada would increase the chance for an accident. Section 5.3.2 of the draft EA provides an accident-risk analysis, based on the methodology described in Appendix A. More traffic count data for local communities, U.S. Highway 93, and Interstate 15 were not provided because Chapter 3 was to focus on areas of potential maximum impact (U.S. Highway 95) to the site. Table 3-8 was included in the draft EA to provide a better description of different service levels and to provide criteria by which to judge the information provided in Table 3-9 (Evening-peak-hour (5-6 p.m.) traffic patterns on U.S. Highway 95, 1982) of the draft EA.

A formal transportation plan will be developed as site characterization and environmental impact studies progress. When final routing is selected, this transportation plan will include information regarding scheduled rest stops, and stops due to unexpected conditions such as weather.

With regard to access through the northeast side of the NTS, such a route would be impossible to establish, since this portion of the NTS is a restricted area which cannot accommodate pass-through traffic.

Issue: Railroads

Fourteen comments were assigned to this issue. A few commenters asked for the location of Dike Siding and the location of the railroad near the Desert National Wildlife Refuge. Several commenters requested more railroad information for such parameters as operation management plans, Federal and State regulations, rail routes, disaster insurance, accident risks, and existing arrangements. Other commenters questioned the extent and adequacy of the tests that the Union Pacific Railroad must meet to be a Class A main line.

Response

A better description of the location of Dike Siding may be found in Section 5.1.1.4.2 of the final EA. Figure 5-2 (Proposed highway and rail access routes to the Yucca Mountain repository) of the draft EA shows the proposed railroad more clearly. The railroad will not cross the Desert National Wildlife Refuge. Therefore, Corn Creek Springs and the Pahrump killifish will not be affected.

More railroad operation, infrastructure, and usage information will be provided in the Environmental Impact Statement. In addition, rail regulations and routing are discussed in Appendix A of the final EA.

The tests resulting in the Union Pacific Railroad main line through Las Vegas being classified as Class A are not relevant to the discussion in Chapter 3. The classification system will be reviewed during the Environmental Impact Statement process.

Issue: Miscellaneous

Three comments were assigned to this issue. One commenter suggested that the draft EA did not fully recognize North Las Vegas. Another requested the written communication from the Union Pacific Railroad noted in Table 3-10 (Recent railroad-traffic patterns) of the draft EA. A third commenter cited a typographical error in the EA text.

Response

The DOE recognizes North Las Vegas as a city but to simplify the many figures, the title "Las Vegas" serves the entire Las Vegas metropolitan area. The written communication from the Union Pacific Railroad noted in Table 3-10 (Recent railroad-traffic patterns) in Section 3.5.2 of the draft EA has been cited in the final EA and included in the references. The typographical error has been corrected.

C.4.1.5 Socioeconomic conditions

The U.S. Department of Energy (DOE) received many comments on the adequacy and accuracy of the draft Environmental Assessment (EA) description of baseline socioeconomic conditions in southern Nevada. Responses to comments on specific issues in the areas of economic conditions, population, community services, and government and fiscal conditions are in sections C.4.1.5.1 through C.4.1.5.5. Twenty-eight general questions were received on the scope and quality of the socioeconomic baseline description. These 28 general comments are grouped into four issues under this section: (1) Overall Approach, (2) Exclusion from Baseline Descriptions, (3) Native Americans, and (4) Statewide Concerns.

Issue: Overall approach

Four commenters felt that the information contained in the draft EA reflected haphazard data collection and generally poor data integration and

analysis. In particular, it was felt that the information provided in Chapter 3 of the EA on background social and economic conditions in Clark County suffered from a lack of detail and analytical depth. References were cited as missing and the way in which specific numbers were developed was unclear. Some information was referenced as having been obtained from newspaper articles, and the feeling was that newspapers should not be used as primary sources of information. Finally, the validity of using various years in the 1980s (rather than census years 1960, 1970, and 1980) to establish a socioeconomic baseline was questioned.

Response

The focus of the socioeconomic data-gathering effort was on information necessary to evaluate the Yucca Mountain site against the socioeconomic-related siting guidelines. Thus, data collection, although not comprehensive, was certainly not haphazard. Also, the purpose of Chapter 3 was to present background data which were used in the actual analyses presented in chapters 4 through 6. The final EA has been revised in a number of places in order to show more clearly how various data were obtained and analyzed. In addition, newspaper references have been deleted in those places where alternative information sources were available. However, newspaper references have been retained in cases in which their main purpose is to help the reader understand a community better.

An advantage of using the decennial census as a data source is that those data constitute an internally consistent and highly credible information base. A major disadvantage of using census data is that they are generally available only every ten years. In preparing the EA, the DOE did not rely solely on census data because timeliness of information is important in understanding the characteristics of a rapidly growing region such as southern Nevada. An evaluation of the requirements for additional socioeconomic data will be an important part of the investigations to be conducted if the Yucca Mountain site is approved for site characterization.

Issue: Exclusion from baseline descriptions

The DOE received 16 comments which pointed out that the draft EA did not discuss socioeconomic conditions in Lincoln County and the City of Caliente, despite the possibility that waste shipments by rail would pass through the county. Also, it was stated, individual communities in Clark County were not described in sufficient detail to enable an accurate portrayal of the county as a whole. For example, the statement that Las Vegas is an "adult community" was used to characterize Clark County, ignoring differences among communities. For example, it was pointed out that the city of North Las Vegas was not identified on any of the EA maps of the area of interest.

Response

Since actual transportation routes have not yet been identified, communities that could be affected by transportation of high-level radioactive waste have not yet been identified. If a repository were located at Yucca Mountain, social and economic impacts would occur in areas where repository-related expenditures would be made and where the immigrating repository-related work force would reside. To the extent that resources are available

at competitive prices, it is expected that the majority of repository-related expenditures would be made in Nye County, where the site is located, and in neighboring Clark County, the major metropolitan area in southern Nevada. The Nevada Test Site (NTS), adjacent to the Yucca Mountain site in Nye County, employs DOE and contractor personnel with skills similar to the construction and mining skills which would be required by the repository work force. Historical settlement patterns of workers at the NTS provide a reasonable indication of where repository workers and their families would settle. Recent settlement patterns of these NTS workers were analyzed using their ZIP codes. The results of this analysis were summarized in Table 5-26 of the final EA. This analysis indicated that most (96 percent) of the NTS workers reported ZIP codes in Nye and Clark counties in 1984. The socioeconomic baseline conditions presented in Section 3.6 of the EA focus on this bicounty area, where almost all of the Yucca Mountain work force would be expected to settle. However, since the data summarized in Table 5-26 of the final EA also indicate that about 1.5 percent of the recent NTS workers reported ZIP codes in other Nevada counties (Douglas, Lander, Lincoln, Lyon, White Pine, and Carson City, a consolidated municipality), the DOE intends to consider a larger geographic area in future studies, if the Yucca Mountain site is approved for site characterization.

As is discussed in Section 6.2.1.7.3 of the draft EA, the favorable conditions of the socioeconomic impacts siting guideline were evaluated at the county level. The first potentially adverse condition (Section 6.2.1.7.4) was evaluated at the community level. As is explained in Section C.7.4 of this Appendix and Section 6.2.1.7.4 of the final EA, population growth rates were used as measures of impacts on community services, housing supply and demand, and the finances of State and local government agencies. Insufficient information was available from published sources to perform detailed community-specific analyses. Information on community services in individual Clark County communities is presented throughout Section 3.6.3. The statement (in Section 3.6.3.1 of the draft EA) that Las Vegas is primarily an adult community was not intended to characterize Clark County as a whole. In order to correct the impression of unwarranted generalization, the statement was deleted from the final EA. Figure 3-21 of the draft EA (Bicounty area surrounding the Yucca Mountain site) was revised to show the location of North Las Vegas.

Further research at the community level would be undertaken if the Yucca Mountain site is approved for site characterization.

Issue: Native Americans

Six comments were received which stated that the document fails to consider potential repository impacts on Native American communities. The commenters suggested that the Moapa River Paiute Reservation and the Las Vegas Paiute Tribe will be directly and significantly impacted by the transportation of waste, both by rail and by road. The draft EA was also thought to be silent regarding the wider range of Native American issues and potential conflicts. A commenter noted that the Western Shoshone continue to claim the land upon which the repository is proposed to be built, and contend that there is no consideration in the EA of present-day Indian concerns such as cultural persistence, quality of life, anthropological issues, and Indian religious freedoms.

Response

Native Americans in southern Nevada have not been certified as "affected" tribes within the meaning of the Nuclear Waste Policy Act (NWPA, 1983). A petition for certification under Section 2(2)(B) of the Nuclear Waste Policy Act was denied the Moapa Band of Paiutes (Frit, 1984). Therefore, Native Americans have not been singled out for special analysis in the EA.

In preparing the draft EA, the DOE was aware of Shoshone claims to the land upon which the repository is proposed to be built. However, the land claim issue was not addressed in the EA because of the Federal Government's position that the Shoshone had no legal right to the land. This position was sustained by a recent U.S. Supreme Court decision which effectively extinguished the Western Shoshone claim of aboriginal title to much of Nevada, including the Yucca Mountain site (United States v. Dann and Dann, February 1985). Two additional comments that voiced similar concerns regarding Native Americans were included in Section C.4.1.5.4.

American Indian reservations, being relatively distant from the Yucca Mountain site, are not expected to be affected significantly by the immigration of repository-related workers and their dependents. The EA has been revised to include more detail regarding the number of American Indians residing on reservations in the bicoounty area and the location of these reservations relative to the Yucca Mountain site. Specific note was made in Section 5.4.4.2 of the draft EA of the potential for impacts on Native American cultures from transportation activities. If the Yucca Mountain site is approved for site characterization, this aspect will receive appropriately detailed treatment in research to be performed during the Environmental Impact Statement process. In addition, the potential impacts of the repository project on Native Americans who live outside of reservations (as well as on other cultural groups in southern Nevada) would be the subject of detailed, community-level data gathering and analysis if the Yucca Mountain site is approved for site characterization.

Issue: Statewide concerns

Two commenters suggested that it may be useful to define the entire State as the "site" for the purpose of socioeconomic analyses. Broad, statewide conditions which should be described include the overall character of the State economy, the relationship of various sectors of the social and economic fabric of the State to counterpart components at the county and local levels, and the relationship of State government and finances to local and county governments. Social and economic analyses pertaining to areas of the State outside the bicoounty area were thought by some commenters to be missing entirely from the draft EA.

Response

One of the functions of the EA is to support the evaluation of the siting guidelines. In neither of the guidelines which address population and other socioeconomic issues (10 CFR 960.5-2-1 and 10 CFR 960.5-2-6) is there a requirement to evaluate impacts at the level of a state. Indeed, for the

qualifying condition, favorable conditions, and potentially adverse conditions under the guideline on Socioeconomic Impacts (10 CFR 960.5-2-6), the DOE is to address potential impacts on and in "the affected area," which has been defined as Clark and Nye counties (as noted previously, in the issue regarding exclusion from baseline description, the analysis focused on those two counties, where about 96 percent of the repository-related workers and dependents are expected to reside). The State would, however, be an important unit of analysis in future investigation of socioeconomic impacts, if the Yucca Mountain site is approved for site characterization.

C.4.1.5.1 Population density and distribution

Three comments addressed population density and distribution. One commenter requested more detailed information to assess the validity and accuracy of the population forecasts presented in the Environmental Assessment (EA). Another stated that a more thorough discussion of the reasons for the recent growth of Nye County population and projections of future growth are necessary. One comment was received which requested more information on average commuting distance, modes of travel during commuting, average hours per day spent in commuting, and commuting information for other (i.e., non-Federal employment).

Response

It is true that an understanding of the reasons for recent and forecast population growth will be important to the future and more detailed assessment of social and economic impacts of locating a repository at Yucca Mountain if the Yucca Mountain site is approved for site characterization. It is not true that such a discussion is necessary to the analysis appearing in the EA. The Nye County population forecast presented in Section 3.6.2.2, Table 3-15 (Population of Nye County 1970-2000) of the final EA, is the most recent available forecast for that county. It was developed in 1984 by the Bureau of Business and Economic Research (University of Nevada, Reno) for the State of Nevada. That forecast will be out of date by the time that an Environmental Impact Statement would be prepared for the Yucca Mountain site. Thus future studies will necessarily address the reasons for growth and projected growth in the area. More information on the population forecasts appearing in Chapter 3 of the EA may be requested from the Nevada Office of Community Services.

Inclusion of more detailed information on commuting patterns would not contribute significantly to the analyses described in chapters 4 through 6. Additional research on worker settlement patterns would, however, be conducted if the Yucca Mountain site is approved for site characterization.

C.4.1.5.2 Economic Conditions

Twenty-seven comments addressed economic conditions. Responses were divided into six issues: (1) General Employment, (2) Nye County Employment, (3) Tables 3-11 and 3-12 of the draft EA, (4) Industrial Employment Sector Percentages, (5) Clark County Employment Growth Rates, and (6) Miscellaneous.

Issue: General employment

Two commenters asked for a reference date for the reported employment of 121,000 persons in the hotel, gaming, and recreation sector. Secondly, it was questioned why mining was not included under "other key employers" in Section 3.6.1 of the draft Environmental Assessment (EA), even though the mining industry makes a significant dollar contribution to the State of Nevada.

Response

The EA has been revised to show that direct wage and salary employment in the hotel, gaming, and recreation industry in Nevada was about 120,000 in 1983.

The mining sector was not mentioned in the discussion of key employers since it has the smallest number of employees of any sector in Nevada (State of Nevada, ESD, 1984). However, Section 3.6.1 of the final EA has been revised to discuss the importance of the mining industry to the State economy. Mining activities are important in the analysis of the employment impacts of the repository discussed in Chapter 5.

Issue: Nye County employment

Eight comments were assigned to this issue. Four commenters noted that Section 3.6.1.1 of the draft EA says that there were 7,508 workers in Nye County, while Nevada Employment Security Department (ESD) records place 1982 employment at 8,640 jobs. Furthermore, they noted that the EA states that 80 percent of the industrial employment was in mining, service, or government while ESD records show 87.6 percent. Three commenters also noted that the EA characterizes construction as a "large employer" in Nye County, while according to ESD administrative data, construction ranked seventh and represented 1.3 percent of industrial employment in the County in 1983. Three commenters noted that employment data for Nye County are presented for various years; this was considered confusing. Lastly, one of these commenters felt that the EA should describe historical Nye County agricultural employment in greater detail.

Response

The EA was revised, using the ESD data, to indicate that 89 percent of the 8,630 nonagricultural wage and salary jobs in Nye County in 1983 were in the mining industry, service industry, and civilian government. Since 1983 is the most recent year for which ESD data are available for both Clark and Nye counties, the EA was revised to show 1983 ESD data wherever the most recent values for wage and salary employment are discussed.

While employment in the construction sector is small, the construction sector is nevertheless important in the analysis of the employment impacts of a repository. Furthermore, according to ESD data, construction employment in Nye County has fluctuated considerably, and has represented as much as 5 percent of the total wage and salary employment in recent years (State of Nevada, OCS, 1985).

With respect to the confusing presentation of Nye County employment data, the EA was revised to clarify that ESD nonagricultural wage and salary employment data are used to show actual Nye County employment in 1980 and 1983 and that Bureau of Economic Analysis (BEA) OBERS data were used for employment projections. (See Table 3-12 of the final EA.)

The U.S. Department of Energy (DOE) felt that the provision of greater detail concerning historical agricultural employment in Nye County would not contribute to or affect the impact analyses presented in chapters 4 through 6.

Issue: Tables 3-11 and 3-12 of the draft EA

Seven comments were assigned to this issue. Some commenters indicated that it was unclear whether the data in tables 3-11 (Employment in selected industries in Nye County, 1978-2000) and 3-12 (Employment in selected industries in Clark County, 1978-2000) of the draft EA are supposed to estimate the number of persons employed by industry or the number of jobs provided by employers, since these are different concepts. The DOE was asked to clarify the EA definition of employment. The comment compared total 1978 Nye and Clark county employment, as shown in tables 3-11 and 3-12 of the draft EA, with ESD administrative data and concluded that there was a 46.7-percent discrepancy for Nye County and a 13.9-percent discrepancy for Clark County. It was felt, on the basis of this comparison, that the data in the two tables were questionable.

Response

Section 3.6.1 of the EA was revised to clarify that two sources of employment data are shown in the EA, and to discuss their differences and the reasons for using both. Briefly, where the text of the final EA presents totals or the percentage distribution in selected industries for 1980 and 1983, wage and salary employment data developed by the Nevada Employment Security Department (ESD) are used. These data are a count of the number of jobs. Since ESD does not produce long-term employment projections, data from the U.S. Bureau of Economic Analysis' OBERS projections were used to develop the projections appearing in tables 3-12 and 3-13 of the final EA. These data represent the number of persons employed. A new section was added to the final EA (Section 3.6.1.3) to discuss the methodology used to develop tables 3-12 and 3-13 of the final EA.

The total number of persons employed has been deleted from tables 3-12 and 3-13 of the final EA (tables 3-11 and 3-12 of the draft EA).

Issue: Industrial employment sector percentages

Three commenters identified minor discrepancies between reported Clark County employment percentages and industrial employment percentages according to the ESD administrative data. One of these commenters gave the following

percentage distribution of industrial employment for Clark County, taken from the State of Nevada Employment Security Department:

Mining	0.2%	F.I.R.E.	4.7%
Construction	6.4%	Service	47.2%
Manufacturing	3.1%	Hotel, Gaming, Recreation	31.7%
T.C.P.U.	6.0%	Government	11.7%
Trade	20.1%		

Response

Section 3.6.1.2 of the final EA was revised to show the percentage distribution using 1983 ESD values for wage and salary employment (State of Nevada, ESD, 1984). The new percentages are

<u>Sector</u>	<u>Percentage of Total Jobs</u>
Service	49
Trade	20
Government	12
Transportation and Public Utilities	6
Construction	5
Mining	0.1

Issue: Clark County employment growth rates

Two commenters stated that the Clark County 1978-1985 employment growth rates presented in Table 3-12 (Employment in selected industries in Clark County, 1978-2000) of the draft EA will be difficult to achieve. Furthermore, it was felt by both commenters that the draft EA projection of 370,221 persons employed in 1990 is significantly greater than the ESD forecast of 327,000 jobs.

Response

The primary purpose of Table 3-12 in the draft EA was to show employment projections for primary sectors. For this reason, the total shown in that table has been deleted from the final EA (Table 3-13). Some of the differences between ESD data and OBERS data used to develop tables 3-12 (of the draft EA) and 3-13 (of the final EA) are discussed in Section 3.6.1 of the final EA. Additionally, a discussion of the methodology used to develop Table 3-13 of the final EA appears in Section 3.6.1.3., a new section of the final EA.

Issue: Miscellaneous

Five comments were categorized into the miscellaneous issue. These are described in the following text.

In the second paragraph of Section 3.6.1 of the draft EA, Nevada real personal income is projected to grow at an average annual rate of 4.8 percent. The DOE was asked to present the method used to obtain this value.

One commenter noted that the written communication from L. Ryan, Director, State Office of Community Services, cited in Section 3.6.1.1 of the EA should be added to the reference section.

One commenter requested that the EA include a more detailed description of the method used to develop the baseline employment forecasts presented in Table 3-11 (Employment in selected industries in Nye County, 1978-2000) of the draft EA.

Two commenters considered baseline data concerning labor and materials markets to be inadequate. Increases in demand for these resources could cause price increases or supply delays, and it was noted that the EA does not discuss elasticity of supply in these markets. It was suggested that the DOE use examples from studies of "boom towns" to show whether "these local inflation conditions" would appear in the area surrounding the Yucca Mountain site.

Response

Section 3.6.1 of the draft EA was revised to discuss the method used to calculate the real personal income growth rate. As a result of using updated population information (DOC, 1985), this growth rate was revised to 4.6 percent in the final EA.

The EA was revised to include two letters from L. Ryan in the references for Chapter 3; they are cited as Ryan, 1984a and 1984b, when they both appear in the same chapter as references.

The final EA presents a more detailed description of the method used to develop the baseline employment projections for Nye County, in Section 3.6.1.3.

The possibility that increases in demand for labor and materials could cause price increases or supply delays will be the subject of more detailed investigations to be conducted if the Yucca Mountain site is approved for site characterization. Elasticity of supply could be one of the topics for research. Possible impacts on labor and materials markets could include changes in the level of activity in those markets, changes in quality of service, and changes in price levels associated with repository-related activities. However, "boom town" examples may not be relevant for the entire affected area and, given the planning and mitigation procedures provided in the Nuclear Waste Policy Act (NWPA, 1983), boom town conditions may not necessarily arise. (See Section C.4.1.5.4 of this Appendix.)

C.4.1.5.3 Community services

The U.S. Department of Energy (DOE) received 24 comments regarding the draft Environmental Assessment (EA) description of baseline community services in the affected area. The discussions within the draft EA addressing community services consisted of assessments of housing, education, water supply, sewage treatment, solid waste, energy utilities, public safety services, medical services, and library facilities. Before discussing particular issues raised by these comments, it is necessary to outline the rationale for the approach taken in preparing Section 3.6.3 of the draft EA.

Two of the main purposes of the EA are to make intersite comparisons and to identify potential impacts. To make the most effective use of its resources, the DOE conducted a coarse screening so that detailed studies would not be performed on sites which ultimately would not be chosen for site characterization. Two measures were used in the Yucca Mountain EA to evaluate potential impacts on community services: (1) total population growth rates with the repository and (2) existence of major potential impacts on delivery of community services, housing supply, and local government finances.

In evaluating the Yucca Mountain site against the Socioeconomic Impacts Guideline (10 CFR 960.5-2-6), favorable condition 1 was considered to be present as long as the annual county population growth rate in the affected area with the repository was forecast to be less than that experienced historically in the area. Potentially adverse condition 1 was evaluated by considering estimated community population growth rates with the repository and qualitative information on the ability of service providers to furnish the incremental levels of services and housing required by the repository-related immigrants. The maximum one-year growth rate of the total population (i.e., baseline population plus estimated repository-related population) of each community in the affected area was used as an indicator of the potential for impacts on housing and community services, since these depend directly or indirectly on population. The qualitative information was obtained primarily from published sources and discussions with major service providers in the biconcounty area.

By limiting the analysis of these favorable and potentially adverse conditions to these measures, the DOE was able to use readily available information and avoid the false impression of precision which would result from the combination of a more sophisticated analytical approach with insufficient data. Therefore, the information presented in Section 3.6.3 of the EA was limited to that which was readily available. The extensive primary research which would be necessary for a thorough evaluation of existing services and projection of future service needs, and which will be conducted in future site investigations, was therefore beyond the scope of the EA investigation. However, published information was used, whenever possible, to gain insights into the adequacy of existing services and to provide background information on individual communities. Finally, an analysis of the settlement patterns of recent Nevada Test Site (NTS) workers indicates that relatively few repository workers and dependents would be expected to

settle outside of Nye County, Indian Springs, and the Las Vegas urban area (see Table 5-26 of the final EA). Therefore, extensive background information on other rural Clark County communities was not necessary for this preliminary analysis.

Sections 3.6.3, 5.4.3, and 6.2.1.7.4 of the final EA have been revised to incorporate the foregoing discussion.

The comments and responses have been grouped into 10 issues: (1) State Services, (2) Housing Information, (3) Education, (4) Water Supplies, (5) Waste-Water Treatment and Disposal, (6) Public Safety, (7) Solid Waste, (8) Energy in Nye County, (9) Radioactive Emergency Response, and (10) Miscellaneous.

Issue: State services

Three commenters asked that the EA examine services provided by the State of Nevada which directly affect local governments and local communities.

Response

Section 3.6.3.8 of the final EA has been revised to include a brief description of social services provided by various levels of government, including the State of Nevada. Detailed information on other services provided by the State of Nevada were not necessary, as explained in the introduction to this section, for the type of analysis performed.

Issue: Housing information

Three comments were assigned to this issue. Two commenters pointed out that the Center for Business and Economics Research (CBER) at the University of Nevada, Las Vegas has more recent data on housing in Clark County. One requested that recent housing vacancy information and reasons why the Nye County housing vacancy rate was 17.9 percent in 1980 be presented. Another commenter described "housing" as a complex integration of many key sectors; and suggested it is affected not only by existing supply and demand but also by extraneous variables as diverse as the behavior of interest rates and the ability of local contractors to hire workers and obtain materials at reasonable costs. The commenter suggested that the financial and building industry underpinnings of "housing" in the affected area should be examined in great detail.

Response

The data mentioned by the commenters were requested from the CBER. However, the information provided did not update the housing characteristics data presented in the draft EA. Neither data on recent housing vacancy rates in Nye County nor reasons why the vacancy rate was 17.9 percent in 1980 were available from published sources during preparation of the draft EA. This type of information will be sought as part of research planned if the Yucca Mountain site is approved for site characterization.

Housing is indeed a "... complex integration of many key sectors of area activity." To assess the effects of repository development on housing at the county or community levels would require a depth of analysis which was outside the scope of the EA. Because a comprehensive housing analysis was not available, the types of detailed information identified in this comment were not presented in the community services background section of the EA. Additional research on housing in the affected area will be undertaken if the Yucca Mountain site is approved for site characterization.

Issue: Education

The DOE received three comments on the level of detail provided in the description of educational services. Commenters noted that schools per 1,000 residents is not a useful basis for comparison of capacity. It was suggested that considerably more detailed information on schools in each community (e.g., extent of overcrowding, busing requirements, student-teacher ratios, maintenance requirements, financing) should be provided in the EA.

Response

Numbers of schools, teachers, and other services per 1,000 population were presented in order to be able to perform a preliminary analysis of community service impacts in a consistent way for several types of services and for the two counties. The shortcomings of this approach are recognized; indeed a caveat on the comparison of the educational ratios for Nye and Clark counties is made in Section 3.6.3.2 of the final EA. While detailed information on classroom space, special education space, common areas, and other as yet unmet needs is certainly relevant to an analysis of the ability of local school districts to accommodate increased demand for educational services, it was felt that the information presented was suitable for the preliminary evaluation approach described above.

Issue: Water supplies

Two comments were received on this issue. One commenter stated that a much more in-depth evaluation of water capacity by source and location and use by demand segment in Nye County is required. Another commenter noted that the information provided in Chapter 3 of the draft EA does not indicate that a water-well inventory was attempted.

Response

The DOE agrees that a more thorough review of water supply and demand in southern Nye County is required in order to gain a complete understanding of potential impacts of repository-induced population growth in the area. Information available from published sources was, however, sufficient to reach the preliminary conclusion that water supplies would be sufficient, given solution of some existing problems. The analysis presented in Section 3.6.3.3 of the draft EA showed that if the present trend of conversion of land use in the Pahrump Valley from irrigated agriculture to residential development continues, then the valley-fill aquifer can support up to about 16,900 people without a decline in usable storage. The situation in the

Amargosa Valley, whose ground-water basin has been designated by the State Engineer, is less clear. Although the basin is over-appropriated, actual irrigation water use is less than half of the sustained yield (see Section 3.3.3 of the final EA). If agricultural development remains limited, then there would be considerable opportunity for expansion of domestic and quasi-municipal uses, which would have the highest preference; conversion of agricultural land use to residential as in Pahrump would improve the water supply situation further. Beatty's water supply problems are discussed in Section 3.6.3.3 of the EA. If new high-quality water sources are not found for that community, then its growth potential could be limited. Section 3.6.3.3 of the EA has been revised to incorporate new information about Amargosa Valley, including water-well information for those portions of the Amargosa Desert ground-water basin designated by the State Engineer.

Issue: Waste-water treatment and disposal

Four comments were assigned to this issue. Information on waste-water disposal regulations or planning guidelines for Nye County was requested. It was asked if existing sewage treatment facilities are at, or close to, capacity. An estimate was requested of the impact of projected future growth in the various areas on the adequacy of treatment systems. An explanation was requested of how local governments finance improvements and/or additions to sewage facilities.

Two commenters pointed out that the Boulder City, Clark County, and Las Vegas waste-water treatment plant capacity data presented in Table 3-21 of the draft EA are inaccurate, and that the "Peak Demand" column does not make any sense. Facilities in 12 additional communities in Clark, Nye, and Lincoln counties should be included in the table.

Response

Waste-water disposal regulations and/or planning guidelines provide indirect evidence of a county's ability to absorb future population growth. However, the method used to evaluate favorable condition 1 of the socio-economic impacts guideline (see sections 3.6.3 and 6.2.1.7.3 of the final EA) precluded the necessity of examining local regulations in detail.

Peak load and capacity of major waste-water treatment facilities in Clark County are compared in Table 3-21 of the draft EA (Table 3-22 of the final EA). On the basis of new information (Walker, 1985) the EA was revised to state that the waste-water treatment capacity of the Beatty Water and Sanitation District has been reached. Information on the capacity and load on other systems in Nye County is unavailable from published sources. Section 3.6.3.4 of the draft EA has been revised to include more information on the capacity of waste-water treatment systems in Clark County. Information on local government measures for financing community services improvements was not necessary for the level of analysis conducted for the EA. This topic will be explored if the Yucca Mountain site is approved for site characterization.

The plant capacity figure for Boulder City in the draft EA was incorrect; it was obtained from a reference (Nevada Development Authority, 1984) which contained the erroneous value of 2.0 million gallons per day.

Table 3-21 of the draft EA (Table 3-22 of the final EA) has been revised to show a capacity of 1.8 million gallons per day. The capacity for the City of Las Vegas waste-water treatment plant is correct as shown, as verified in a letter from the City of Las Vegas (Donovan, 1984). A new reference for the capacity of the Clark County plant (which is correct as shown) has been added (Brown and Caldwell and Culp/Wesner/Culp, 1980).

Table 3-21 was also revised to show that Henderson uses a different type of waste-water treatment process than was reported in the draft EA. The heading "Peak Demand" was changed to "Peak Load."

Given the community services evaluation approach described in the introduction to this section, it was not necessary to include descriptions of the waste-water treatment system in each community in the affected area. As discussed in Section C.4.1.5 of this Appendix, Lincoln County was excluded from the analysis because the focus was on the areas in which most (i.e., 96 percent) the repository-related work force would likely settle.

Issue: Public safety

Three comments were assigned to this issue. Two commenters requested additional information on public safety services in Nye County, including station capacity, jail facilities, number of marked and unmarked cars, and communication and dispatch services. Another commenter pointed out that detention facilities are currently overcrowded and could be impacted by the influx of people. Increases in crime rates are a likely occurrence if population growth exceeds employment growth. Additional information on fire protection was requested, including numbers of fire departments, number and location of stations, personnel, fire ratings, condition of stations and equipment, number of incidents responded to, response time, and emergency medical services provided by fire departments. It was stated that the EA should contain standards of adequacy for rural and urban police and fire operations.

Response

Detailed information on police services in Nye County was unavailable from published sources during preparation of the draft EA. Furthermore, the level of detail requested in this comment is not necessary for the evaluation approach described in the introduction to this section.

The inadequacy of some of the detention facilities in Clark County was mentioned in Section 3.6.3.7 of the draft EA. Information on the extent of overcrowding of detention facilities in other parts of the affected area was unavailable from published sources during preparation of the draft EA. Similarly, available information was insufficient to support a judgment of whether "Increases in crime rates are a likely occurrence if population growth exceeds employment growth."

Detailed information on fire protection and emergency medical services was unavailable from published sources during preparation of the EA. Furthermore, details of the nature requested were not necessary for the evaluation approach described in the introduction to this section.

The main reason for not comparing community services levels with standards is presented under the "Miscellaneous" issue. There are several other reasons why use of national or regional police and fire protection standards was deemed inappropriate. In the Las Vegas urban area, the large visitor population makes problematical the use of standards derived from studies of cities without such a large tourism component. Also, an unknown number of private security officers are employed by the hotels and casinos in the Las Vegas area. Thus it is difficult to relate protective service levels to national data. In rural areas, especially in Nye County, per capita standards may also be inappropriate, given the large distances which must be covered by police and fire services.

Issue: Solid waste

One commenter requested additional information on the capacity and number of years remaining in expected landfill life, materials accepted at landfills, and methods of disposing of hazardous waste materials.

Response

Information on landfill capacity in Nye County was unavailable from published sources during preparation of the draft EA. This information would be obtained in future investigations if the Yucca Mountain site is approved for site characterization. Consideration of materials accepted at the landfills and the method of disposing of hazardous waste materials is not directly relevant in considering the impact of future population growth on community services.

Issue: Energy in Nye County

One commenter pointed out that the energy utility information provided in Section 3.6.3.6 of the draft EA does not give details on suppliers, capacity, and use in Nye County. This information, plus information on generation, transmission, distribution, and service facilities and capacity should be provided.

Response

Table 3-22 (Energy distributors in Nye and Clark counties) of the draft EA (Table 3-23 of the final EA) reports that the principal supplier of electrical energy to the communities of Nye County nearest the Yucca Mountain site is the Colorado River Commission. The utility which distributes the electricity is the Valley Electrical Association. Information on capacity and use in Nye County was not available from published sources. The remainder of the information requested by this commenter was not necessary for the evaluation approach described in the introduction to this section. However, the EA was revised to specify more clearly the service area of the Sierra Pacific Power Company and to show that Mount Wheeler Power supplies electricity to northwest Nye County.

Issue: Radioactive emergency response

Two commenters felt that the EA should provide more information on the capability of local police, fire, and medical care facilities to handle emergencies involving radioactive exposure.

Response

Published information on emergency services and special trauma and burn treatment facilities in Clark and Nye counties was unavailable during preparation of the draft EA. In addition no estimates of the number of emergency cases involving radiation exposure have been developed. It is therefore unreasonable at this point to assess the demands upon protective services and existing and proposed medical facilities by accidents of this nature. Further research into both the demand for emergency services and medical treatment of radiological accident cases and the proposed means for handling them will be conducted if the Yucca Mountain site is approved for site characterization.

Issue: Miscellaneous

Two commenters felt that the EA should not only express community service conditions quantitatively, but should also draw substantiated conclusions as to the adequacy of these conditions as they currently exist. The same observer reflected that no treatment of community services for Clark County can be considered adequate unless it specifically addresses the effects that massive numbers of tourists have on the type, level, adequacy, and overall status of each service category.

Response

In preparing the EA, comparison of levels of various services with national or regional standards was considered. It was decided, however, not to use these types of standards. Actual average historical service levels (in the form of per capita ratios) reveal citizen preferences; they implicitly take into account community judgment as to the adequacy of services. It is true that an analysis at the margin (i.e., of the additional services required by each additional member of the community) would be preferable. However, sufficient data for such an analysis were not available. More detailed investigations, to be undertaken if the Yucca Mountain site is approved for site characterization, will include consultation with communities to ascertain appropriate measures of service levels. Nevertheless, qualitative statements about the adequacy of water supply, public safety, medical, and recreation services are presented in final EA sections 3.6.3.3, 3.6.3.7, 3.6.3.8, and 3.6.3.10, respectively. Because the issue of the capability of State, county, and local service agencies to accommodate repository-related population growth is so important, detailed research in this area will also be conducted if the Yucca Mountain site is approved for site characterization.

The effects of large numbers of tourists on the ability of local agencies to provide community services are discussed briefly in sections 3.6.3.7 and 3.6.3.8 of the final EA. Further research in this area will be conducted if the Yucca Mountain site is approved for site characterization.

C.4.1.5.4 Social conditions

The U.S. Department of Energy (DOE) received 19 comments on sections of the Environmental Assessment (EA) devoted to background sociocultural characteristics in the affected area. From these, the following seven issues were identified: (1) Nye County Homogeneity, (2) Worker Settlement Patterns, (3) Urban Culture, (4) Social Organization and Structure, (5) Indian Tribes, (6) Boom-Bust Communities, and (7) Attitudes and Perceptions.

Issue: Nye County homogeneity

One commenter stated that the description of the population of Nye County as "fairly homogeneous" may be somewhat misleading and that in actuality (when the data are disaggregated) there are significant racial divisions. This commenter believed that a more useful approach would be to describe each community in terms of its unique ethnic, age, sex, racial, and even religious composition.

A second commenter questioned whether it was consistent to describe the population as "fairly homogeneous" if there were also relatively high numbers of Native Americans and if half of some areas are Hispanic.

Response

The statement regarding the homogeneity of Nye County population was based upon the aggregate data presented in Table 3-24 of the draft EA, Table 3-26 in the final EA (Comparison of selected social characteristics by region). The table shows that the Nye County population for 1980 was classified by the U.S. Department of Commerce, Bureau of the Census (DOC, 1983), as 100% rural and 92% white; both percentages were higher than the average for the United States, Mountain States, Western States, the State of Nevada, and Clark County.

The approach suggested by the first commenter would be useful. Data were, in fact, disaggregated, as much as possible, in the discussion of individual communities located close to the site (see section 3.6.4.1.1). However, only limited community-level information is available at this time. Additional community-level primary data will be sought if the Yucca Mountain site is approved for site characterization.

The description of Nye County as "fairly homogeneous" is not inconsistent when read in context. As noted above, the statement regarding the homogeneity of Nye County population was based upon aggregate data (presented in Table 3-26 of the final EA). These data also show relatively less variation in racial composition (with the exception of Native Americans, as noted) in Nye County than in other areas included in the table. The statement regarding the Hispanic population did not draw on the county-level data presented in the table and was attributed to only one small community within the county (the Town of Amargosa Valley; see section 3.6.4.1.1 of the draft and final EA).

Issue: Worker settlement patterns

Two comments were received relative to worker settlement patterns. It was stated that according to Section 3.6.4.1.1 of the draft EA, "... immigrants would be most likely to settle in those rural communities that provide services and amenities." Other variables, such as distance from the work site and the fit between the immigrating workers and the racial, ethnic, religious, and economic composition of the community, were considered by these commenters to be of equal or greater influence.

Response

The DOE agrees that worker settlement patterns are a product of many factors in addition to levels of community services and amenities. The sentence in question has been deleted from the final EA.

Issue: Urban Culture

The five comments assigned to this issue address three topics: description of urban culture, alleged cultural bias of the investigators, and influence of tourism.

Description of urban culture. Although the DOE says in Section 3.6.4.2 of the draft EA that "... the rich diversity of cultures and lifestyles exhibited in Nye and Clark counties is outlined in the following section ...", the actual discussion of the issue consists only of broad generalizations, according to two commenters. In particular, the attempt to describe the "urban culture" of Clark County in one short paragraph in the draft EA was considered inadequate.

Response. The two subsections on rural and urban cultures (3.6.4.2.1 and 3.6.4.2.2, respectively) contain more than generalizations. Insufficient material was available from published sources to provide more detail and depth. However, the data presented in Section 3.6.4.2, along with those presented in Table 3-24 (Comparison of selected social characteristics by region) of the draft EA (Table 3-26 of the final EA), are adequate for the purpose for which they were intended. The purpose of Section 3.6.4.2.2 (Urban culture) was not to present a detailed portrait of urban culture, but rather to provide a basis for assessing the likely cultural compatibility of immigrant workers and existing residents. As is emphasized in Section 5.4.4 of the EA, the assessment does not claim to be anything other than preliminary at this stage. At a minimum, there is an adequate basis for making the preliminary assertions that (1) considerable diversity of cultures exists in the affected area and (2) immigrating workers are likely to be able to select a compatible cultural environment.

Alleged cultural bias of the investigators. One commenter objected to the cited conclusion by Adams, and Gottlieb and Wiley in the draft EA that "... all citizens must reach some accommodation between gaming and other cultural values." The commenters claim that this reflects the cultural bias of the investigators rather than the reality of the attitudes and beliefs of those citizens who live in a community where gaming is legal, socially acceptable, and almost excessively regulated.

Another commenter stated that those associated with gaming and tourism are not necessarily transients, but are generally part of the "more settled population groups." They stated that Section 3.6.4.2.2 of the draft EA was obviously written by someone not familiar with the area.

Response. In the absence of primary data gathering and analysis (which would permit exploration of deeply felt attitudes and beliefs), the DOE was limited to documentation of the overt part of the culture and to published statements concerning cultural values. Documentation was deliberately selected from regional and local sources in order to avoid the possibility of cultural bias. Section 3.6.4.2.2 of the EA has been revised to delete the reference to Gottlieb and Wiley. References in that section have been limited to Nevada sources.

The statement to which the second comment refers is, "A basic division, however, may be discerned between the life styles of the transients (associated with gaming and tourism) and relatively more settled population groups." The reviewers evidently interpreted "transients" to mean local employees in the gaming and tourism sectors. This was not the intention of this statement. Not all of those associated with gaming and tourism are necessarily transients. However, the 12.5 million visitors who stayed an average of 4.3 nights in 1984 (Las Vegas Review-Journal et al., 1985) could certainly be classified as transients (i.e., persons who are passing through or by a place with a brief stay or sojourn). The EA has been revised to exclude the word "transients".

Influence of tourism. Statements in Section 3.6.4.2 of the draft EA suggested to one reviewer that there is a basic division between people who work in gaming and people in other occupations. This commenter noted that a more significant impact resulting from gaming is the large influx of tourists and that the EA should focus on the influences of tourism, including its importance to the social, cultural, and economic fabric of the community.

Response. The DOE did not intend to suggest that there is a basic division between people who work in gaming and other Clark County residents. It is true that many people who work in gaming-related capacities also hold other jobs. The basic division is between persons who are settled members of the community and those who are "passing through." The "two faces" of Las Vegas which are noted in Section 3.6.4.2.2 of the draft and final EA are part of its uniqueness. The influences of tourism and gaming are closely interwoven. Section 3.6.4.2.2 of the EA has been revised to clarify the two major aspects of the Clark County culture: The image of Las Vegas as the "Entertainment Capital of the World," and the cultural diversity that exists.

Issue: Social organization and structure

The five comments assigned to this issue address four topics: social organization and dynamics, imbalance in the description of Las Vegas, comparison between Nye County and Clark County, and influence of tourism.

Social organization and dynamics. It was stated that sections 3.6.4.1.1 and 3.6.4.1.2 of the draft EA contain no description of the dynamic interplay of relationships that characterize each community and make it unique. According to two commenters the EA should examine the social organization and structure of each jurisdiction, with special attention given to those communities, or even neighborhoods, where prospective repository workers are most likely to settle.

Response. The types of information and analyses requested by these commenters are more appropriate to an Environmental Impact Statement than to an Environmental Assessment. In the absence of community-level primary data gathering and analysis, it is not possible to provide the type of portrait requested. Additional primary data gathering and analysis to be undertaken as part of the Environmental Impact Statement (EIS) process, if the Yucca Mountain site is approved for site characterization, should permit a more detailed treatment of social organization.

Imbalance in the description of Las Vegas. One commenter expressed the opinion that the statements made about Clark County in Section 3.6.4.1.2 of the draft EA should be balanced by a discussion regarding the "normal community" aspect of Las Vegas.

Response. The discussion requested by the commenter is in Section 3.6.4.2.2 of the draft EA.

Comparison between Nye County and Clark County. One commenter stated that comparisons between Nye and Clark counties are worthless. This same commenter felt that the draft EA discussion of rural social organization and structure (first paragraph, Section 3.6.4.1.1) is self-serving, and that operating from a small population base it is easy to show rapid growth and low social problems.

Response. The paragraph in question was not intended to be self-serving; it is more appropriately viewed as one part of an entire section which points out differences between the urban and rural sections of the affected area. This section of the final EA has been revised to include a caveat regarding the small numbers and the small population base in Nye County.

Influence of tourism. The comment was made that statistics presented in Section 3.6.4.1.2 of the draft EA should reflect the influence of tourists.

Response. Section 3.6.4.1.2 has been revised to include the statement that certain social indicators such as rates of divorce, homicide, and crime are inflated by the large number of nonresidents. Suicide rates for Clark and Nye counties were calculated from data on suicide by county of residence, and therefore are not inflated.

Issue: Indian Tribes

One commenter felt that little information on Indian Tribes was provided in the draft EA. A second commenter, noting that the Shoshone people continue to claim the land on which the repository is proposed to be built,

emphasized that an understanding of their culture and its reverence for the land would be essential if conflict between repository interests and Indian interests and culture is to be avoided.

Response

As was discussed in Section C.4.1.5 of this Appendix, Native Americans in southern Nevada have not been singled out for special analysis in the EA because they have not been certified as "affected" tribes within the meaning of Section 2(2)(B) of the Nuclear Waste Policy Act of 1982 (NWPA, 1983). A petition of certification under Section 2(2)(B) was specifically denied the Moapa Band of Paiutes (Frit, 1984). Therefore, Native Americans have been addressed in the EA in a manner similar to other cultural units in the affected area.

Furthermore, American Indian reservations, being relatively distant from the Yucca Mountain site, are not expected to be affected significantly by the immigration of repository-related workers and their dependents. The final EA has been revised to include more detail regarding the number of American Indians residing in the bicoounty area and their location relative to the Yucca Mountain site. Specific note was made (in Section 5.4.4.2 of the draft EA) of the potential for impacts on Native American cultures from transportation activities. This discussion has been expanded further in the final EA. When actual transportation routes are identified, additional research on this subject will be undertaken. In addition, the potential impacts of the repository project on Native Americans who live both on and off reservations (as well as other cultural groups in southern Nevada) would be included in the more detailed, community-level data gathering and analysis to be conducted if the Yucca Mountain site is approved for site characterization.

In preparing the draft EA, the DOE was aware of the Shoshone claims to the land upon which the repository is proposed to be built. However, the land claim issue was not addressed in the EA because of the Federal Government position that the Shoshone had no legal right to the land. This position was sustained by a recent U.S. Supreme Court decision which effectively extinguished the Western Shoshone claim of aboriginal title to much of Nevada, including the Yucca Mountain Site (United States v. Dann and Dann, 1985). Awareness of Native American (including Shoshone) reverence for the land is indicated in the wording and references of Section 5.4.4.2 of the final EA. As noted in the preceding paragraph, the potential for impacts on Native American culture, as on other cultures in the affected area, will be assessed during the detailed community-level data gathering and analysis to be conducted if the Yucca Mountain site is approved for site characterization.

Issue: Boom-bust communities

The comment assigned to this issue addresses two topics: boom-bust cycles, and community-specific examination of rural culture.

Boom-bust cycles. One commenter suggested that since the effects of boom-bust economic cycles have had such major impacts on rural communities in

Nevada, a fairly comprehensive discussion of the extensive literature on boom-bust communities in the West might be very appropriate in section 3.6.4.2.1 of the EA.

Response. A comprehensive review of the boom-bust literature was not considered appropriate for the EA because (1) the boom-bust literature, which has been undergoing revision (see Murdock et al., 1985; and Wilkinson et al., 1982), is not relevant for the entire affected area and (2) a focus on boom-bust literature presupposes that the repository would also cause boom-bust conditions, which is by no means certain given the planning and mitigation procedures provided in the Nuclear Waste Policy Act (NWPA, 1983). Nevertheless, several references were identified in the draft EA so that the reader could pursue additional material if desired. An additional reference (Murdock et al., 1985) has been included in the final EA. Together, the references cited in Section 3.6.4.1 of the final EA provide a comprehensive overview of the early boom-bust literature and more recent thinking in the field.

Community-specific examination of rural culture. One commenter felt that to be useful, an examination of the characteristics of rural culture should be community-specific, so that the key elements of unique cultural manifestations in each community and the potential for repository impacts can be examined.

Response. While it is true that it would be more meaningful to address community-specific cultural characteristics, insufficient information was available from published sources during EA preparation to provide the community specificity, detail, and depth called for by this comment. This kind of detailed data will be sought during studies undertaken if the Yucca Mountain site is approved for site characterization.

Issue: Attitudes and perceptions

The two topics in this issue concern the incomplete survey data in Section 3.6.4.4 of the draft EA and the need to study attitudes towards the repository on a statewide basis.

Incomplete survey data. One commenter stated that according to the survey cited in Section 3.6.4.4 of the draft EA, a majority of those surveyed opposed the idea of locating a repository "... on the Test Site in southern Nevada ..." and 6 percent were undecided. Since the 6-percent figure is known for those undecided, it was asked why the figure for those opposed was not expressed in terms of a percentage. The commenter also asked whether respondent answers would have been even less favorable if they had known that only part of the proposed repository site is actually on the Nevada Test site (NTS).

Response. The final EA has been revised to summarize all the percentages as follows:

Strongly favor	6.4%
Favor	23.9%
Oppose	26.7%
Strongly oppose	37.4%
Undecided/don't know	5.6%

The complete survey responses are included with all the other EA references on file for public viewing (UNLV, 1984). It is not appropriate for the DOE to speculate on the respondents' answers under alternative hypothetical situations.

Attitude surveys. A final commenter felt that attitudes toward the repository should be gathered on a statewide and interstate basis, since to identify one or two counties as the only recipients of major impacts is misleading at best.

Response. As noted in Section C.4.1.5 of this Appendix, none of the siting guidelines which address socioeconomic issues requires evaluation of impacts at the level of a State. For the qualifying condition, favorable conditions, and potentially adverse conditions under the Guideline on Socioeconomic Impacts (10 CFR 960.5-2-6), the DOE is to address potential impacts on and in "the affected area," which is defined as Clark and Nye counties. Historical settlement patterns of workers at the NTS, adjacent to the proposed repository site, indicate that most (96 percent) of the repository related population could be expected to settle in these two counties. It is expected that studies undertaken in preparation for the EIS would encompass a larger geographic area, as appropriate, based on the EIS scoping process, if the Yucca Mountain site is approved for site characterization.

C.4.1.5.5 Government and fiscal conditions

The U.S. Department of Energy (DOE) received four comments on the draft Environmental Assessment (EA) presentation of background information on government and fiscal conditions in the affected area. These have been grouped into two issues: (1) Additional Data and (2) Effects of 1983 Legislation.

Issue: Additional data

Three commenters thought that although the draft EA does contain some data on government services and revenues by source, baseline data needed to conduct an analysis of fiscal impacts to State and local governments as a result of the repository were insufficient, even as a starting point.

Response

It is true that a broad base of information is required on the fiscal conditions of potentially affected jurisdictions in order to assess financial impacts. This information would be acquired during studies conducted

concurrently with site characterization and form the basis of analyses appearing in the Environmental Impact Statement, if the Yucca Mountain site is approved for site characterization. The information presented in Section 3.6.5 of the draft EA is a starting point; it identifies the government entities most likely to be affected by a Yucca Mountain repository and the sources of revenues that are important to those entities.

Issue: Effects of 1983 legislation

One commenter asked that the EA provide some mention of the impact that the 1983 legislative changes have had on local governments, saying that revenues are far less prevalent than before 1983.

Response

The 1983 State Legislature made some adjustments in the State property tax laws. However, it is not believed that these changes would affect the results of the socioeconomic impact analysis. Detailed analyses of government fiscal structures will be undertaken during site investigations to be conducted if the Yucca Mountain site is approved for site characterization.

C.4.2 ACTIVITIES PROPOSED FOR SITE CHARACTERIZATION

This category addresses comments and questions received on the site-characterization activities proposed for Yucca Mountain. It does not include, however, questions on the environmental and socioeconomic impacts from these activities (see sections C.7.2 and C.7.4 of this document). Specific questions regarding site characterization field studies and the exploratory shaft are answered in the following subsections. Seven general comments were received on this subject and they are answered below. One commenter asked how the equipment used during site characterization will be moved to and from the site and how it will be stored, and another asked that the Environmental Assessment (EA) include a discussion of California State regulations regarding equipment use and construction activities. Another commenter suggested that site characterization should be conducted with great care because the preferred depth of emplacement 300 meters (984 feet) may not accommodate all the waste. A fourth commenter stated that the standard operating practices identified in the EA should include provisions for storing and managing hazardous materials such as waste oil and solvents from the maintenance of heavy equipment. The last two commenters addressed site characterization studies in general (including geochemical surveys), saying that these tests should be completed prior to completion of the Environmental Impact Statement in order that their results may be evaluated by the appropriate reviewing agencies.

Response

Equipment will be moved to and from the site by conventional methods (e.g., by the motor power of each piece of equipment or on flat-bed trucks). The equipment will be stored, used, and removed in a conventional manner. The amount of equipment is insignificant compared to that which will be used

during repository construction and operations. Federal regulations are included in the specifications that dictate the design of all systems in the exploratory shaft facility. California Mine Safety Orders are referenced because they have been historically used on the Nevada Test Site (NTS) and are judged to be sufficient to meet all applicable Federal regulations. The California Mine Safety Orders are also specified in U.S Department of Energy Order 5480.1A (DOE, 1981) and 5480.4 (DOE, 1984). In addition, the Nevada mining regulations incorporate the Federal regulations by reference.

The favorable condition regarding adequate host-rock flexibility was not claimed for the site, since only site characterization activities can result in a clear definition of the three-dimensional variability in rock properties. The data will allow the DOE to position the repository to enhance waste containment and isolation.

The standard operating practices used on the NTS for storing and managing materials such as waste oil and solvents will be used by the contractor during the construction of the exploratory shaft facility. These substances will not be disposed of on the ground at Yucca Mountain.

While geochemical surveys and field activities have been included under the category of "Exploratory Drilling" (Section 4.1.1.1 of the final EA), the overall site characterization activities described in Section 4.1.3 of the final EA will result in considerable data that will be used to prepare the Environmental Impact Statement. It will not be possible to complete all activities scheduled for site characterization before the Environmental Impact Statement is released. Therefore, monitoring will continue beyond release of the Environmental Impact Statement and interim data and technical reports will be published so the appropriate reviewing agencies can have access to the results.

C.4.2.1 Field studies

This category contains all questions and comments on the adequacy and accuracy of the field studies proposed for site characterization. Seven comments were received on this subject. One commenter asked for the locations of boreholes that would be drilled at the site to map the water table. Other commenters stated that although geologic and nongeologic data will be collected during site characterization, only the plans for collecting geologic data are presented in the draft Environmental Assessment (EA), and a fourth specifically requested that ground motion studies be not only continued, but also expanded. It was also requested that a detailed site characterization plan be released after the final EA is published, and reviewed by the Nuclear Regulatory Commission (NRC) to assure that key licensing issues will be addressed. In a related comment, a sixth commenter suggested that further drilling studies be conducted to assure that no pressurized brine pockets, water, or toxic gases are present in the repository horizon. Lastly, it was suggested that an independent contractor, responsible to the State of Nevada,

monitor all site characterization activities in order to cross-check and validate the U.S. Department of Energy and U.S. Geological Survey studies and results.

Response

About twenty new exploratory holes will be drilled during site characterization. The exact locations of each drill site will be included in the Site Characterization Plan (SCP) which will be issued after the final EA has been published if Yucca Mountain is recommended for site characterization. Further ground motion studies are also planned.

The nongeologic data to be gathered during site characterization will be described in two separate documents. These documents will address environmental and socioeconomic subjects. The EA is not an appropriate document for a thorough description of data-gathering activities planned during site characterization.

After the EA is published, a very detailed plan for site characterization will be released if the Yucca Mountain site is recommended. The NRC along with the State and other members of the public will review this plan to assure that key licensing issues have been identified in the SCP, and to assure that the plans for testing provided in the SCP will result in information that will help resolve licensing issues. However, State of Nevada monitoring of site characterization activities must occur at the discretion of State authorities.

C.4.2.2 Exploratory shaft

This category includes 27 comments on the construction, operation, and decommissioning of the exploratory shaft, related surface facilities, and the tests that are planned from the exploratory shaft. Because of the variety of subjects that are covered by this category, it has been divided into four issues: (1) Exploratory Shaft Facility, (2) Potential Contamination, (3) Tracer Studies, and (4) Miscellaneous.

Issue: Exploratory shaft facility

Six comments were received on this issue. A better explanation was requested of why the faults shown on lithologic logs were not shown on cross sections in the draft Environmental Assessment (EA). Also requested were the dimensions of the underground facility. Another commenter suggested using long drifts and small-diameter holes during site characterization. Other recommendations were that design of the exploratory shaft should take into consideration the Probable Maximum Flood rather than a 100-year flood. Finally, one commenter wanted to know how much time would be required to construct the facility.

Response

The scale of the cross sections in the EA, such as Figure 5-5 (East-west cross section of the proposed Yucca Mountain repository) of the draft EA, are

too small to illustrate faults observed in cores, since the ratios needed to illustrate these would be on the order of 1:1,250. Furthermore, these faults may not intersect the surface, and thus would not be included on maps that show surface locations of faults.

The exact dimensions of the underground openings are not known at this time because the Exploratory Shaft Test Plan has not been completed. The relative magnitude of the openings, however, can be estimated from Figure 4-1 (Three-dimensional illustration of the exploratory shaft facility) in the final EA.

The technical feasibility of using long-hole drilling techniques with air as the drilling fluid is of concern to the Nevada Nuclear Waste Storage Investigations (NNWSI) Project. Expansion of the drifts to obtain necessary site characterization data is being considered.

The U.S. Department of Energy (DOE) agrees that it will consider the Probable Maximum Flood rather than only the 100-year flood. This has been indicated in the final EA.

In Section 4.1.2.1 of the draft EA it states that the surface facility should take 6 to 7 months to complete, and the underground facility an estimated 23 months to complete.

Issue: Potential contamination

Nine comments were received on this issue. Two commenters requested information about the quantity and content of liquid effluents that might percolate into the alluvium from the sewage lagoon and the rock-storage area and potentially interfere with planned hydrologic tests. The commenters also suggested that liners be used to reduce this potential infiltration and recommended that all sewage be disposed of to the east or west of the site. Environmental impacts of the proposed design were requested. It was also asked whether the design included a 100-year storm specification. Another commenter stated that the requirements of the Nuclear Waste Policy Act in regard to the use of radioactive materials should be described in the EA. Finally, one commenter suggested that the draft EA was inconsistent by stating that radioactive materials would not be used for testing during site characterization and then stating that radioactive tracer materials would be used.

Response

Even though the quantity of effluents in the seepage fields probably would not interfere with testing in the exploratory shaft, a decision has been made to extend the sewer line off the repository block. The sewer-lagoon concept has been abandoned in favor of a septic tank and drain field. Discharge from the septic system will be sufficiently above the water table that there will be no impact to ground water. The design of the exploratory shaft facility will be modified to remove the sewage to drain fields to the east of the proposed repository block. Mine refuse water will be removed from the site, and disposed of in the lined rock-storage pile. Finally, the details of the storm-runoff drainage design around the exploratory shaft facility site are being modified. However, it was not intended that the

containment structures receive or contain storm runoff except from the local area of the pad and muck pile.

Water added to control fugitive dust will be tagged with sodium bromide so that its presence in the underground can be identified. The rock-storage pile will be located to the east of the repository block, and will be lined and bermed to minimize potential discharge to the ground water or surrounding land.

The use of radioisotopes for tracer studies and radioactive sources for well logging are discussed in Section 4.1.1.1 of the final EA. The radioactive tracers to be used have short half-lives (from several hours to tens of days), and thus will completely decay within a short period of time (from a few days to a few months depending on the isotope). The well-logging sources are retrievable. This type of testing is commonly performed throughout the United States for exploration of oil, gas, and mineral deposits. No prototype tracer testing involving containers that hold radioactive wastes is currently planned.

Issue: Tracer studies

Five comments were received, all dealing with the chemical and tracer studies planned to be conducted at the exploratory shaft facility site. It was recommended that all vadose water should be collected and analyzed, and that this analysis be included in the final EA. Other commenters opposed the use of water at any time during excavation or drilling of the unsaturated zone, claiming that the tagging of water can differentiate from in situ water in terms of identification only, not in terms of quantity. The use of sodium bromide as a tracer was questioned by all commenters in this area.

Response

No appreciable vadose water is encountered during drilling and attempts to extract pore water have been largely unsuccessful. Considerable effort is being planned to study any vadose zone water that can be obtained during exploratory shaft facility construction testing rather than attempting studies for inclusion in the final EA. This will include collecting water from any observed inflows during shaft construction, and collecting large rock samples for pore water analysis. Although likely to be minor, water seeps in the shaft will be collected by embedding "weep tubes" into the rock at the source of the seepage and collecting this water before it reaches the shaft sump. These studies will be carried out during site characterization. Safety considerations require that some construction water be used for dust control, however, such usage will be held to a minimum.

Sodium bromide will be added to all exploratory shaft facility construction water. Sodium bromide was chosen as a tracer after laboratory testing indicated that neither ion was sorbed by samples of Yucca Mountain rocks. This tracer is also different from that used during surface drilling of USW G-4 so that the source of possible contamination can be determined. It is expected that even with the employment of carefully controlled procedures to minimize water usage during construction, construction water will gain access to seepages in excavations. It is anticipated that large block samples of uncontaminated rock can be obtained for pore water analysis. The

purpose of the tracer is to enable potential contamination to be observed and documented.

Issue: Miscellaneous

Six comments were assigned to this issue. Two commenters wanted to know what the potential alternatives were to decommissioning the exploratory shaft if Yucca Mountain is found to be unsuitable for a repository and what mitigation measures would be followed to ensure habitat restoration. Two other commenters questioned how Coyote Wash was selected as the site for the exploratory shaft. One commenter wanted to know why the DOE does not expect to find perched water during construction of the exploratory shaft, and another questioned the amount of water to be used during construction.

Response

The the Nuclear Waste Policy Act of 1982 (NWPAct) states that if the site is not selected for development of a repository, then reclamation and mitigation, as required by NWPAct, will occur. All requirements for shaft and borehole sealing will be met. Alternative uses could become part of reclamation or mitigation activities, although no information is available at this time.

The site-selection process for the exploratory shaft location is documented in Bertram (1984), "NNWSI Exploratory Shaft Site and Construction Method Recommendation Report" (SAND84-1003). The site selected in Coyote Wash was the preferred site of the five that were considered.

Water used for compaction of the fill for the site pad construction will be tagged, but the amount to be used is not expected to be excessive. It is also expected to remain near the surface.

The water encountered in drill hole USW UZ-1 contained constituents of drilling fluid, and therefore water introduced to the host rock by drilling of a nearby hole, USW G-1, had probably drained laterally and become temporarily trapped. The DOE acknowledges that perched water zones may occur, although evidence to date suggests very little water will be encountered in drill holes.

C.4.2.3 Other activities

No comments were received in this category.

C.4.2.4 Alternative activities

No comments were received in this category.

C.4.3 THE REPOSITORY

This issue includes 101 comments and questions concerning the design, construction, operation, and decommissioning of a repository at Yucca Mountain. Eight issues were identified within this category: (1) Design and Construction of Surface and Subsurface Facilities; (2) Alternative Repository Designs; (3) Transport of Men, Materials, and Waste; (4) Waste Form, Content, and Packaging; (5) Repository Operations, Waste Emplacement, and Waste Retrieval; (6) Material, Energy, and Labor Requirements; (7) Compatibility with Non-repository Operations; and (8) Miscellaneous.

Section 5.1 of the final Environmental Assessment (EA) has been rewritten to describe the case of the two-stage repository as developed in MacDougall (1985), which has been revised to include more background data. Manpower, material, and costs are based on the vertical waste emplacement case.

Issue: Design and construction of surface and subsurface facilities

Thirty-three comments were received on this issue. Because of the variety of subjects within this issue, it has been separated further into topics which address land resources, site data, transportation, flood control measures, and repository design.

Land resources. Reviewers wanted to know the boundaries of the land that would be withdrawn if Yucca Mountain were selected as a repository site and the number of acres that would be disturbed. Also requested was an estimate of the volume of rock that would be affected by the repository. Another questioner indicated that the western flank of Yucca Mountain does not allow for lateral expansion of the repository block, but if lateral expansion to the west did occur, access to the environment could occur along a fault.

Response. Figure 3-1 (Location of Yucca Mountain site in southern Nevada) shows the location of the site. If Yucca Mountain is selected, approximately 5,000 acres of public land administered by the Bureau of Land Management (BLM) would be withdrawn from public access. The area is labeled "BLM Land" in the lower-left corner of the enlarged area shown on Figure 3-1 (Location of Yucca Mountain site in southern Nevada). As shown on Table 5-7 (Highway, bridge, and railroad construction materials), 150 acres would be cleared for the main surface complex, 1,200 acres would be cleared for the rail spur, and 195 acres would be cleared for the highway.

The underground area of the repository will be 1,520 acres, although many rock pillars and walls will remain. The "volume envelope" is estimated to be about 45 meters thick. The current room design for vertical emplacement is 15 feet wide by 21.5 feet high.

The commenter is correct in that expansion of the repository to the west is not planned; but it is not precluded yet, since the available data are insufficient to reach a conclusion. Areas of probable expansion are to the north and northeast. The emplacement horizons is at least 200 meters (656 feet) below the land surface in all areas.

Site data. A few comments concerned the relation between engineering measures and the natural conditions at the site. One commenter believed that the DOE was building a case to use engineered barriers to overcome natural deficiencies at the site. Another commenter stated that the draft EA was inconsistent in stating in Section 5.1.1.3 that perched water might be found during excavation of the repository and stating in Section 4.1.2.4 that perched water is unlikely. It was also asserted that the DOE had not described in sufficient detail how the access ramp to the repository would be constructed in areas where it would cross faults and joints. Several commenters requested information on the various techniques for mining tuff and information was requested on the size of surface structures and their cost. Another commenter stated that the mined zeolitic tuff could be hazardous to the general public and should be carefully controlled. Finally, one commenter wanted to know how thick the walls of the repository would be.

Response. Regulations issued by the DOE and the Nuclear Regulatory Commission (NRC) require that a system of engineered barriers be used in a repository to supplement the natural barriers to radionuclide transport. Section 6.4.2.1.1 of the final EA has been expanded to discuss in more detail the engineered barriers.

The two statements regarding perched water are not inconsistent; it is unlikely that significant amounts of perched water will be found during construction of the exploratory shaft or the repository, but the possibility cannot be completely ruled out that some perched water may be encountered.

A variety of techniques will be used to ensure that all underground openings remain stable. The standard procedure, which is widely used at the Nevada Test Site (NTS), is to use rock bolts and wire mesh. If stability becomes a problem in areas where underground openings pass through fault planes, other construction materials would be used, such as (1) shot-crete (a concrete mixture sprayed over the wire mesh), (2) structural steel, and (3) poured concrete formed in place. A monitoring system will provide data on underground opening integrity through a performance confirmation program.

The specific mining technique to be used will depend on the results of site characterization, although current information indicates that excavation is feasible using either a drill-blast-mucking technique or a continuous mechanical miner.

Design of the surface facilities is preliminary and will not be detailed until the license application design is complete. The relative size of the facilities is described in Section 5.1 of the EA. Preliminary cost estimates are provided in Section 5.4.1.3 and Table 5-44 (Preliminary cost estimate for the Yucca Mountain repository assuming vertical emplacement) of the final EA.

Zeolites included in the muck pile may require more controls than are required for other rocks to be mined at Yucca Mountain. However, materials particularly high in zeolitic content, such as the Calico Hills tuff underlying the host rock, are not expected to be mined during repository development.

There are no man-made walls in the repository design that would encompass the underground opening where the wastes will be stored. The walls of

the repository are the rock formations comprising Yucca Mountain. The rock pillars that provide support for the underground openings will be a minimum of 30 meters (approximately 100 feet) wide for vertical waste emplacement and 414 meters (1,360 feet) wide for horizontal waste emplacement depending upon which method is finally selected.

Transportation. Several comments concerned the rail spur and the access road that would be constructed if Yucca Mountain were chosen as a waste site. The commenters wanted to know about the exact route of the rail spur, as well as information on heavy hauls, safety, and the construction process. Another commenter suggested that a highway be constructed along the rail route to divert truck traffic around (north of) Las Vegas. Finally, a commenter wanted to know why the DOE plans a 14-meter (46-foot)-wide access road considering that most roads in Nevada are less than 12 meters (40 feet) wide.

Response. The rail spur would be constructed on public lands administered by the Federal Government, except for the federally withdrawn lands of the NTS and the privately owned land in the vicinity of Dike Siding. The spur would originate at Dike Siding, an existing Union Pacific transshipment facility located about 18 kilometers (11 miles) northeast of Las Vegas. The single-track route would extend about 161 kilometers (100 miles) northwest to Yucca Mountain paralleling the north side of U.S. Highway 95. It would lie south of the southern boundary of the Desert National Wildlife Range and enter the NTS south of Mercury. The track would bypass the towns of Indian Springs and Cactus Springs and the Indian Springs U.S. Air Force facilities. No final decision has been made on the use of this route, but this is the route that has been considered in the EA.

Information about heavy hauls, safety, and the construction process cannot be fully determined until route selection has been finalized.

Construction of a highway that would parallel the rail spur and bypass Las Vegas has not been considered at this time but neither has the option been eliminated.

Finally, the access road from the Town of Amargosa Valley to the site is presently conceived as having a 30-meter (100-foot) right-of-way. The right-of-way will be fenced, but controlled public access to the site--perhaps to a visitor center--will be allowed. The actual design of the roadway, however, has not been initiated. Therefore, statements concerning "minimum safe widths" of roadways are not appropriate at this time.

Flood control measures. Several comments concerned run-off and potential flooding at the site. One commenter stated that proper management of flood waters is essential to avoid infiltration into the ground water. Another commenter argued that the DOE should not have tried to demonstrate that flooding at the site could be mitigated because the guidelines address the potential for flooding, not whether the DOE can mitigate flooding. One commenter stated that run-off at the site should be considered contaminated and disposed of in an approved manner. A few commenters requested information about the berm that would be used to retain run-off and leachates from the rock-storage pile, and stated that such a discussion was required because it was included in Chapter 4 for the exploratory shaft. A few commenters expressed concern about seepage of effluents into the subsurface from the

sewage lagoon and rock-storage pile. It was stated that all natural waste containment structures should be lined and monitored. Finally, one commenter stated that the DOE should evaluate the effects that floods would have on surface facilities, bridges, and rail lines in the Yucca Mountain area.

Response. Design of the surface facilities will be based on the Probable Maximum Floods determined in accordance with ANSI/ANS 2.8-1981. Surface facilities will be protected from floods by constructing channels and/or dikes to divert run-off away from (and safely through) the site, and by constructing facilities above flood plains. There is no reason to consider run-off at the site as contaminated because run-off will consist solely of surface water flow. Site preparation will provide for appropriate run-off diversion and control of erosion. The actual design of the surface facilities will be completed during the license application design study after detailed topographic maps become available. All sewage lagoon and rock-storage structures will be lined and monitored although the designs are conceptual at this time. Final designs will address seepage into the subsurface. A statement to this effect has been added to Section 5.1 of the final EA.

The DOE does not claim credit in the guidelines for flood protection by engineering measures. Flood-control structures will nevertheless be constructed at the site to control sheet wash.

It is true that no discussion was included in Chapter 5 on a berm, nor on the possible environmental impacts of run-off from the rock-storage pile. There is currently no specific design of a rock-storage berm for the repository, although its design will comply with all applicable State and Federal environmental requirements.

Finally, the draft EA acknowledges the influence that flood potential has on the design of all surface facilities at and near the site. Additional site-specific information bearing on the design of the repository will be gathered during site characterization.

Repository design. A few commenters asked why the descriptions of surface facilities, shafts, and other components of the repository were not consistent among the EAs and asked that the DOE provide an explanation of these differences. A few commenters wanted to know how the basic assumptions regarding the design, construction, and operation of the repository have changed and what effect these changes could have on the environmental assessment. Another commenter argued that because the repository design is not final, the extrapolation that future design standards can be met is faulty. Another reviewer stated that permits will be necessary for the planned fuel storage facilities depicted in Figure 5-4 (Preliminary site plan for the main surface facilities complex at Yucca Mountain) of the draft EA.

Response. The differences in the descriptions among the EAs reflect site-specific design differences due to such things as differences in surface topography, subsurface access and layout, rock type, and waste-transportation needs at each site.

The basic assumptions about the repository that have changed since issuance of the draft EA are: (1) commercial high-level reprocessing wastes will

not currently be disposed of at the repository; therefore, the waste inventory will consist of spent fuel and a small amount of defense high-level waste; and (2) the concept of the two-stage repository. Each of these new topics is addressed in Section 5.1 of the final EA. However, future acceptance of commercial high-level waste will not be precluded.

The final design of the repository will meet all regulations and standards in effect at the time of licensing. If design standards existing at the time are not met, a license to operate the repository can not be granted by the NRC.

Figure 5-4 in the draft EA (which depicts fuel storage facilities) is a conceptual model of a preliminary plan. The configuration depicted is not necessarily the final design. In this regard, all necessary permits will be obtained.

Issue: Alternative repository designs

Twelve comments were received on this issue. Most comments concerned a lack of information in the EA about alternative designs (particularly a two-stage repository, monitored retrievable storage (MRS), vertical versus horizontal waste emplacement, and backfilling) and their effects on the physical and socioeconomic environments.

Response

The final EA indicates that a two-stage repository as described in the two-stage repository report (MacDougall, 1985) has been fully discussed along with other options in Section 5.1 of the EA. Ramp access is an option for the repository, and Chapter 5 has been rewritten to reflect this; however, vertical shaft access has not been precluded. Chapter 5 also provides a comparison of vertical and horizontal emplacement of waste. Present information indicates that all impacts will be greatest for vertical emplacement, so the EA is conservative. A study has yet to be made to determine the preferred method. However, the choice of an access method is an issue of safety and operating efficiency and will be resolved as part of the conceptual design effort; it is not pertinent to the siting guidelines. The only activity for the two-stage repository approach that is different from the approach described in the draft EA is the construction of the small Stage 1 waste-handling building. Operation of this facility will have negligible health and safety impacts.

The possibility of fuel consolidation elsewhere (e.g., a MRS facility) is under consideration, but has not been resolved. Analyses in the EA have assumed that these operations will be performed onsite, and it is therefore conservative with respect to environmental and socioeconomic assessments of the Yucca Mountain site. Section 141 of the Nuclear Waste Policy Act directs the DOE to study the need for, and the feasibility of, construction of MRS facilities for spent fuel and high-level waste (NWPA, 1983). It also directs the DOE to submit to Congress a proposal that establishes a program for the siting, construction, and operation of MRS facilities.

The initial DOE plans for a MRS facility, as reflected in the April 1984 draft Mission Plan (DOE, 1984), consisted of a MRS facility to provide backup storage capability should there be significant delays in the availability of a geologic repository. In this case, the DOE planned to propose to build and operate a MRS facility to store spent fuel until the repository was ready to receive it. As soon as the repository became available, the spent fuel stored at reactor sites was to be shipped to the repository for packaging and disposal. When the repository had sufficiently reduced the spent-fuel backlog at the reactors, the MRS facility was to ship its spent fuel, packaged in sealed waste disposal containers, to the repository for any additional preparation that might be necessary and for disposal.

The DOE has carefully reanalyzed the provisions of the Nuclear Waste Policy Act (NWPA, 1983) and of the programmatic options in the June 1985 Mission Plan (DOE, 1985) and is currently evaluating an integrated waste management system that consists of both storage and disposal components. A MRS facility is the part of the integrated system that would perform most, if not all, of the waste-preparation functions before emplacement in a repository.

Therefore, the MRS facility in the integrated waste-management system does not have the same role as the MRS facility studied in the past or described in the draft Mission Plan (DOE, 1984). Its primary function is waste preparation for emplacement in a geologic repository. Its role in providing backup storage is secondary, although it could provide temporary backup storage if the startup of the repository is delayed. Locating the waste-preparation functions (i.e., spent-fuel consolidation and packaging) in an integral MRS facility would, to that extent, simplify the design, construction, and operation of the repository facilities. By providing a processing and storage capacity between waste acceptance from the utilities and emplacement in a repository, the MRS facility would help maintain better and more consistent control over the flow of waste from reactor to repository. An integral MRS facility would also provide a hub for the logistics of managing spent-fuel transportation, cask-fleet operations, and cask-fleet servicing. By shipping consolidated fuel to the repository, possibly in dedicated trains, the number of cross-country shipments could be significantly reduced.

Studies conducted during the summer of 1985 to support the January 1986 proposal are intended to define more precisely the waste preparation functions which would be performed by a MRS facility in an integrated waste management system. Qualitatively, the environmental impacts discussed in this EA encompass those for a repository design coupled with a MRS facility, if Congress authorizes a MRS facility. This is due to the fact that the repository concepts evaluated in the present EA include those surface facilities which would be part of the MRS facility if the MRS facility is constructed separately.

Appendix A of this EA presents general background information on transportation topics and issues. A description of a transportation system which integrates the MRS facility into the waste management system was used to

estimate the impacts of transportation costs and risks. This new analysis does not replace the analysis for the reference case but rather is presented in addition to it. The reference case and the MRS transportation analysis is found in Section 3.5 of the final EA.

The description of the backfill option has been clarified in Section 5.1.3 of the final EA. However, sealing the repository (as opposed to back-filling) is a conservative assumption with regard to the severity of environmental impacts.

Finally, Table 5-12 (Comparison between the two-stage repository concept and the preliminary repository concept for the Yucca Mountain site) of the draft EA is now Table 5-1 and has been expanded in the final EA to show a comparison of the two repository design concepts (two-stage design and current design) in terms of socioeconomic, transportation, and environmental impacts.

Issue: Transport of men, materials, and waste

Three comments were received on this issue. Several commenters asked if the routing noted in the draft EA (U.S. Highway 95) would influence the number of shipments to the repository, and which routes would be used to ship construction materials to the site. Other commenters asked about the nuclear waste receipt rate in regard to trucks and trains waiting to be unloaded because of ill-defined "repository acceptance standards." An error was noted in Table 5-11 (Spent fuel waste receipts by year, metric tons uranium equivalent) of the draft EA concerning the number and rate of spent-fuel shipments.

Response

As noted in Section 5.1 of the draft EA, the number of shipments for a given waste disposal container quantity will be determined by the carrier-type (rail or truck) selected, not the route.

The routes used by trucks and trains hauling construction materials for highway construction to the site will depend on their point of origin.

Receipt rate and repository acceptance standards for the waste have been described in more detail in the final EA. The receipt rate indicated in the draft EA on Table 5-11 (Spent fuel waste receipts by year, metric tons uranium equivalent) has been corrected in Table 5-3 of the final EA.

Issue: Waste form, content, and packaging

Twelve comments were received on this issue. Two topics were identified: waste storage and waste disposal container design.

Waste storage. Several commenters stated that defense and transuranic wastes were discussed inconsistently throughout the EA. Comments also focused on whether liquid wastes, fuel rods, and wastes from Three Mile Island would be included in the repository. Two commenters stated that the total amount of waste stored at the repository could be more than 70,000 metric tons of uranium (MTU) and that the possibility of a MRS facility

should be discussed. Another commenter stated that the health, safety, and thermal-loading implications of emplacing 5-year-old fuel (rather than 10-year-old fuel) in the repository should be discussed.

Response. Various sections of the draft EA have been rewritten to include defense wastes. The EA did not consider the disposal of transuranic wastes in the repository, except to the extent that defense high-level wastes can be considered transuranic waste. Spent fuel will be the primary waste material placed in the repository. Other waste types referred to in the EA are site-generated waste (e.g., contaminated tools and clothing) and possibly a small amount of vitrified defense waste. There are no plans to accept waste from Three Mile Island.

In the EA the repository design assumes that a maximum of 70,000 MTU will be emplaced, which is consistent with the DOE interpretation of the Nuclear Waste Policy Act (NWPA, 1983). Furthermore, after the construction of a second repository, there would be no need to increase the capacity of the first repository. However, the Nuclear Waste Policy Act will allow expansion if for some reason it is necessary.

The "Standard Contract for Disposal of Spent Nuclear Fuel and/or High Level Radioactive Waste" (10 CFR Part 961) establishes the contractual terms and conditions under which the DOE will make available nuclear waste disposal services to the owners and generators of spent nuclear fuel and high-level radioactive waste as provided in Section 302 of the Nuclear Waste Policy Act. The contract designates spent fuel aged as little as 5 years out of reactor as standard spent fuel. The Standard Contract (10 CFR Part 961) and the Mission Plan (DOE, 1985) both specify that the DOE will accept fuel for disposal on an "oldest first" basis. Therefore, for most of the first repository receiving and emplacement period, the average age will be greater than 10 years with an estimated 5 to 10 percent aged as little as 5 years. The current EA reference design is based on 10-year-old fuel.

The DOE has not yet conducted studies to assess the impact of accommodating this amount of 5-year-old waste. These studies will be performed during the license application design phase of the repository design process. At this point, the DOE believes that the incremental impacts on the environment due to any received 5-year-old waste will be minor. The impacts will be due to higher thermal and radiation levels and can be accommodated by changes in operating procedures and by increased shielding.

Also, if the MRS facility is approved by Congress, it may be desirable to age the 5-year-old fuel at the MRS facility prior to disposing of it in the repository. An analysis of aging will be performed in conjunction with the studies discussed above, if the MRS facility is approved by Congress. The MRS facility is discussed in the issue entitled "Alternative Repository Designs."

Waste disposal container design. Several commenters requested a better explanation of "high-integrity package," and for the distinction between "canisters," "casks," and "packages." A few commenters stated that there are many unanswered questions about the waste disposal containers, and one commenter asked if the conclusions about the repository would change if the life span of the waste packages is less than 300 years.

Response. The final EA contains a better explanation of waste disposal containers, casks, and packages. High-integrity packages are packages that will contain wastes for at least 300 years. The casks used to transport waste to the repository will be licensed by the NRC. Waste disposal containers used at the repository will be designed to safely contain wastes. This design will be based on tests already in progress.

The waste package is one element of a multiple barrier system designed to provide waste containment. However, if the life span of the waste packages is estimated to be less than 300 years, a redesign of the package would be required.

Issue: Repository operations, waste emplacement, and waste retrieval

Thirteen comments were received on this issue, and separated into two topics: waste acceptance and waste retrieval.

Waste acceptance. Many questions were asked about the standards by which waste will be accepted and emplaced at the repository and the remedial actions that would be taken if the waste was unacceptable. Questions were asked about how the repository will handle a peak of shipments caused by such things as weather-delayed trucks arriving at the same time, and what would be the health and safety effects from such delays. One reviewer wanted to know where the electricity will be purchased to operate the repository and what would happen if there was a power outage. Other reviewers wanted more information about the heliport planned for the repository, including: the number and frequency of flights; whether the stability of subsurface openings will be monitored during operation of the repository; and whether the Air Force would provide security for the repository.

Response. The waste-receiving facility provides the interface between incoming waste shipments and the hot-cell facility in which the waste is placed in waste disposal containers. The waste-emplacement rate of 3,000 MTU per year is an average rate. To allow for variations in receipt rate, unloading facilities will be designed to accept waste at a higher rate. In addition, onsite storage of 150 MTU of waste will be provided for the Stage 1 facility, plus 750 more for the Stage 2 facility to accommodate variations in the shipping rate caused by such things as weather-delayed trucks arriving at the same time. A waste package is suitable for emplacement if the closure weld is sound, the package is not physically damaged, and the outer surface is free of radioactive contamination.

Vehicles waiting to be unloaded will contain waste in licensed shipping casks and could rarely be contaminated. If they were contaminated, washing would be the preferred method of decontamination. The wash water could then be decontaminated, through such means as centrifuging, and re-used as appropriate. Solids extracted from the water could then be packaged in drums and put in the repository.

The incoming waste must meet certain acceptance standards in terms of external radiation and mechanical compatibility with waste-handling equipment. Radiation levels will be checked and certified prior to shipment from a reactor and then recertified at the repository. The most likely cause for a waste shipment not meeting acceptance standards is mechanical damage to

the cask fittings during transit. Detection of additional radiation would not necessarily be associated with such damage, but repairs would be required prior to unloading the transport cask.

Studies are currently being done by the DOE for all participants at the NTS and their future power needs. It appears that power is available for NTS expansion, including the repository, from the Nevada Power Company and the Valley Co-op. In case of power disruptions, the repository will be equipped with stand-by generators to provide power to safety-related equipment.

An analysis of helicopter traffic into and from the repository will be considered for the final safety analysis or the Environmental Impact Statement. The aircraft impact-analysis conducted for the safety analysis provides a bounding case for the EA.

Monitoring, maintenance, and inspection of the underground openings would be a normal part of repository operations. Sensors will monitor opening stability, temperature, and radiological and nonradiological air quality. Monitoring of emplacement boreholes will include measurements of temperature, radiation levels, and sidewall conditions.

Security services at the repository will be provided by a private contractor.

Waste retrieval. Additional information was requested about waste retrieval, such as an analysis of a worst-case accident. Also mentioned was a concern that the waste would not be retrievable for more than 50 years after emplacement. One commenter wanted to know where the wastes would be stored if they were retrieved.

Response. The position of the Office of Civilian Radioactive Waste Management (OCRWM) Program on the issue of retrievability is that the repository be designed, constructed, and operated so that the capability to retrieve the previously emplaced waste packages is retained for up to 50 years after the first waste is emplaced in the repository, unless a longer or shorter time period is specified by the Secretary (DOE) and approved by the NRC. This condition will be maintained until the satisfactory completion of a performance confirmation program as stipulated by 10 CFR Part 60.111 (including NRC review) and after decommissioning activities are authorized by the NRC.

The repository design, in accordance with 10 CFR Part 60, will have the capability to begin the retrieval at any time for 50 years after the start of waste-package emplacement. For design purposes, it is assumed that the actual retrieval, if retrieval proves to be necessary, would take approximately as long as the period used for waste emplacement and repository construction. This length of time is consistent with the provision in 10 CFR Part 60.111, in which public health and safety considerations are of primary importance in any waste-retrieval operation.

The capability to retrieve the waste packages from backfilled rooms would be demonstrated prior to a decision to backfill the waste package storage rooms and would be maintained regardless of whether the storage rooms

have been backfilled. Therefore, the decision to backfill would be based in part on an evaluation of the advantages of early backfilling versus the disadvantages of increased difficulty of retrieval.

During the summer of 1985, the DOE developed a position on retrievability to fully describe and document all design, construction, operation, and maintenance equipment requirements associated with retrievability. Progress has been made in evaluating the effects of these requirements on the repository design and in assessing the associated equipment needs. These retrieval effects will be analyzed and addressed during the site characterization period and subsequent design phases supporting the license application.

Use and storage of wastes that had been retrieved would depend on the reason that retrieval was initiated.

Issue: Material, energy, and labor requirements

Twenty-three comments were received on this issue. Because of the variety of subjects within this issue, it has been separated further into two topics: materials requirements and labor force estimates.

Materials requirements. Additional information was requested about the types, amounts, and sources of materials that would be required for the repository (including the rail spur and access road); the source of these estimates; and the potential conflicts these requirements may pose on a growing Las Vegas. A few commenters stated that, to the extent possible, raw materials for the repository should be acquired from Nevada sources. Several commenters wanted to know how much water would be required for the repository and whether the DOE currently has water rights in this area, specifically for Well J-13 which may be the water source for the repository. One commenter wanted to know how much electricity would be required for the project and the effects that this consumption could have on local demand. Finally, one commenter requested the source of information for Table 5-8 (Estimated requirements for construction equipment) of the draft EA.

Response. The types and amounts of materials required for a repository are listed in Section 5.1 of the final EA. Materials for constructing the repository will probably be obtained from the most economical sources, which in many cases may be local. The purchasing details are not known at this time, but are reserved for detailed study at a future date. Material and resource requirements for construction of the rail and road are included in the overall estimates in the EA. It is the DOE view that a comprehensive discussion of potential conflicts between the material-supply requirements of the repository and Las Vegas is more appropriate for the Environmental Impact Statement. Estimates of material and resource requirements in the final EA are derived from MacDougall (1985), which now contains an appendix that provides details on material and resource requirements that are too lengthy to include in the EA.

The maximum yearly water demand for the repository is estimated to rise to a peak of 120,000,000 gallons per year at the end of the sixth year and decrease to about 115,000,000 gallons per year and remain at this level for the next 26 years. The minimum average water demand for the following

23 years of operation would be approximately 2,500,000 gallons per year. Analyses to date indicate that sufficient water to support the repository can be obtained from new or existing wells at the NTS (such as Well J-13) for which the DOE has water rights.

The estimated demand for electricity for the repository is less than 5,000 million kilowatt hours. The DOE is currently conducting a study of future load and power requirements of the Nevada Test Site.

The source of information for construction equipment (Table 5-8) is based on assumptions presented by project participants with construction-related experience. The estimates in this table are based on typical requirements for the construction of a large facility.

Labor force estimates. Several commenters questioned the method by which labor force estimates were made in the draft EA.

Response. Labor force estimates were derived from several sources. The sources used to derive the labor force estimates, are presented in Section 5.1 of the final EA. Briefly, for construction, cost estimates were prepared by an architect-engineer according to the conceptual design of the facility and the material-labor-cost ratios experienced at other large projects. The labor man-hours were then obtained and the number of construction workers calculated. For operations, detailed operations procedures were developed (Dennis et al., 1984), times for each operation estimated, and man-hours determined. Coupled with the number of operations required for the repository capacity, this determined the number of operations workers.

Uncertainty in manpower estimates have been reflected in two ways: (1) a contingency factor, which varies from 20 to 40 percent (MacDougall, (1985)), is applied based on the complexity of the repository component; and (2) an overall contingency allowance of 30 percent applied to manpower estimates. The estimates with and without the contingency factors applied result in upper and lower bounds on these estimates.

Part of the criticism of the labor force estimates is related to the uncertainty surrounding the actual design of the repository. It is true that the design of the repository is still preliminary. That, however, is precisely why additional impact analyses are planned, and why detailed socio-economic studies await more specific information about the design. Results of these future impact studies will be included in the Environmental Impact Statement.

Issue: Compatibility with non-repository operations

Two comments were received on this issue. One requested a discussion of radio and electronic emissions from the repository that could affect nearby military operations and weapons testing. Another requested information about the potential danger to the repository and the repository workers from routine weapons testing.

Response

Construction and operation of the repository would result in both radio-electronic emissions and additional noise levels at the site. Radio traffic would be associated with incoming traffic, material, and waste shipments. Radio frequencies will be selected that will not interfere with ongoing civilian or military activities in the area. Potential effects of radio-electronic emissions on Air Force operations will be continually assessed as the repository program develops.

The DOE proposes to remove underground workers at the repository during weapons testing as a precaution. If a repository is constructed at Yucca Mountain, it will be built to withstand the ground motion from either natural earthquakes or from underground nuclear explosions.

Issue: Miscellaneous

Three comments were received that were classified in this issue area. One commenter requested an explanation of the term indirect employees. Another commenter asked if saboteurs could, at some time in the future, extract the wastes. Finally, one commenter stated that the first paragraph of Section 5.1.2.1 of the draft EA was unclear.

Response

As defined in Section 5.4.1.1 of the draft EA, indirect employment is the "... increase in trade, service, and other employment that can be attributed to the increased demand for goods and services." All of Section 5.1 of the draft EA has been rewritten for the final EA. As a part of this revision, Section 5.1.2.1 was reviewed and edited in an attempt to make the text more clear.

The final repository design will include a number of physical security systems to prevent potential sabotage to the repository or to its contents. Other security measures will be developed in later design stages.

REFERENCES FOR CHAPTER C.4

- ANSI/ANS (American National Standard Institute/American Nuclear Society), 1981. "American National Standard for Determining Design Basis Flooding at Power Reactor Sites," ANSI/ANS-2.8-1981.
- Bell, E. J., and L. T. Larson, 1982. Overview of Energy and Mineral Resources for the Nevada Nuclear Waste Storage Investigations, Nevada Test Site, Nye County, Nevada, NVO-250, Nevada Operations Office, U.S. Department of Energy, Las Vegas.
- Benson, L. V., J. H. Robison, E. K. Blankennagel, and A. E. Ogard, 1983. Chemical Composition of Ground Water and the Locations of Permeable Zones in the Yucca Mountain Area, Nevada, USGS-OFR-83-854, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Bertram, S. G., 1984. NNWSI Exploratory Shaft Site and Construction Method Recommendation Report, SAND84-1003, Sandia National Laboratories, Albuquerque, N. Mex.
- Brown and Caldwell and Culp/Wesner/Culp, 1980. Las Vegas Valley Water Quality Program, Phase I Treatment Facilities Study, Las Vegas, Nev.
- Carr, W. J., 1984. Regional Structural Setting of Yucca Mountain, Southwestern Nevada, and Late Cenozoic Rates of Tectonic Activity in Part of the Southwestern Basin, Nevada and California, USGS-OFR-84-854, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Christiansen, R. L., and P. W. Lipman, 1965. "Geologic Map of the Topopah Spring NW Quadrangle, Nye County, Nevada," U.S. Geological Survey Quadrangle Map GQ-444, Scale 1:24,000, Washington, D.C.
- Claassen, H. C. 1983. Sources and Mechanisms of Recharge for Ground Water in the West-Central Amargosa Desert, Nevada--A Geochemical Interpretation, USGS-OFR-83-542, Open-File Report, U.S. Geological Survey, Denver, Colo.

- Coache, R., ca.1983. "Amargosa Water Use Inventory 1983," State of Nevada, Department of Conservation and Natural Resources, Water Resources Division, Las Vegas (Tabular Material on Water Use).
- Craig, R. W., and J. H. Robison, 1984. Geohydrology of Rocks Penetrated by Test Well UE-25p 1, Yucca Mountain Area, Nye County, Nevada, USGS-WRI-84-4248, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- Czarnecki, J. B., 1985. Simulated Effects of Increased Recharge on the Ground-Water Flow System of Yucca Mountain and Vicinity, Nevada-California, USGS-WRI-84-4344, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- DOC (U.S. Department of Commerce), 1983. County and City Data Book, 1983, A Statistical Abstract Supplement, U.S. Government Printing Office, Washington, D.C.
- DOC (U.S. Department of Commerce), 1985. 1985 OBERS BEA Regional Projections, Volume 1, State Projections to 2035, Bureau of Economic Analysis, Washington, D.C.
- DOE (U.S. Department of Energy), 1981. "Environmental Protection, Safety, and Health Protection Program for DOE Operations," DOE Order 5480.1A, Washington, D.C.
- DOE (U.S. Department of Energy), 1984. "Environmental Protection, Safety, and Health Protection Standards," DOE Order 5480.4, Washington, D.C.
- DOE (U.S. Department of Energy), 1984. Mission Plan for the Civilian Radioactive Waste Management Program, Overview and Current Plans, DOE/RE-0005, (draft), two volumes, Washington, D.C.
- DOE (U.S. Department of Energy), 1985. Mission Plan for the Civilian Radioactive Waste Management Program, Overview and Current Program Plans, DOE/RW-0005, three volumes, Washington, D.C.
- Donovan, D. E., 1984. Letter from D. E. Donovan (City of Las Vegas) to M. Rogozen (SAI), July 12, 1984; regarding infrastructure - wastewater treatment.

- Dudley, W. W., Jr., 1985. Letter from W. W. Dudley (USGS) to D. L. Vieth (WMPD), October 31, 1985; regarding status of on-going neotectonic studies.
- Frit, J. W., 1984. Letter from J. W. Frit (Deputy Secretary for Indian Affairs) to Chairman C. R. Surrent (Moapa Band of Paiutes), June 19, 1984; regarding certification of the Moapa Band of Paiutes as an "affected Indian tribe."
- Johnstone, J. K., R. R. Peters, and P. F. Gnirk, 1984. Unit Evaluation at Yucca Mountain, Nevada Test Site: Summary Report and Recommendation, SAND83-0372, Sandia National Laboratories, Albuquerque, N. Mex.
- Kensler, C. D., 1982. Survey of Historic Structures: Southern Nevada and Death Valley, JAB-00099-121, URS/John A. Blume and Associates, Engineers, San Francisco, Calif.
- Kerrisk, J. F., 1983. Reaction-Path Calculations of Groundwater Chemistry and Mineral Formation at Rainier Mesa, Nevada, LA-9912-MS, Los Alamos National Laboratory, Los Alamos, N. Mex.
- Las Vegas Review-Journal, Nevada Development Authority, and First Interstate Bank of Nevada, 1985. Las Vegas Perspective, Las Vegas, Nev.
- Lipman, P. W., and E. J. McKay, 1965. "Geologic Map of the Topopah Spring SW Quadrangle, Nye County, Nevada," U.S. Geological Survey Quadrangle Map GQ-439, Scale 1:24,000, Washington, D.C.
- MacDougall, H. R. (comp.), 1985. Two-Stage Repository Development at Yucca Mountain: An Engineering Feasibility Study, SAND85-1351 (Rev. 1), Sandia National Laboratories, Albuquerque, N. Mex.
- McBrien, S. and L. Jones, 1984. Nevada Nuclear Waste Storage Investigations: Socioeconomic Impacts of Constructing a High-Level Waste Repository at Yucca Mountain, SAND84-7201, Sandia National Laboratories, Albuquerque, N. Mex.
- Montazer, P., and W. E. Wilson, 1984. Conceptual Hydrologic Model of Flow in the Unsaturated Zone, Yucca Mountain, Nevada, USGS-WRI-84-4345, Water-Resources Investigations Report, U.S. Geological Survey, Lakewood, Colo.

- Montazer, P., E. P. Weeks, F. Thamir, S. N. Yard, and P. B. Hofrichter, 1985. "Monitoring the Vadose Zone in Fractured Tuff, Yucca Mountain, Nevada," Characterization and Monitoring of the Vadose Zone, National Water Well Association Symposium, Denver, Colorado, November 19-21, 1985.
- Morros, P. G., 1982. "Ruling in the Matter of Applications 34760...45090 Filed to Appropriate Waters from an Underground Source in the Amargosa Desert Ground Water Basin, Nye County, Nevada," Office of the Nevada State Engineer, Carson City.
- Murdock, S. H., F. L. Leistritz, and R. R. Hamm, 1985. "The State of Socioeconomic Analysis: Limitations and Opportunities for Alternative Futures," paper presented at the Annual Meeting of the Southern Association of Agricultural Scientists, Biloxi, Mississippi, February 3-6, 1985.
- Nevada Historic Preservation Plan, 1982. Archaeological Element for the Nevada Historic Preservation Plan, Nevada Division of Historic Preservation and Archaeology, Carson City.
- Nevada Development Authority, 1984. The Southern Nevada Community Profile, Las Vegas, Nev.
- Newman, W. J., 1979. Order Designating and Describing the Amargosa Desert Ground Water Basin, Nye County, Nevada, Office of the State Engineer, Carson City, Nevada.
- NRC (U.S. Nuclear Regulatory Commission), 1982. Standard Format and Content of Site Characterization Reports for High-Level-Waste Geologic Repositories, Regulatory Guide 4.17, Office of Nuclear Regulatory Research, Washington, D.C., 52 p.
- NWPA (Nuclear Waste Policy Act), 1983. "Nuclear Waste Policy Act of 1982," Public Law 97-425, 42 USC 10101-10226, Washington, D.C.
- Pippin, L. C., and D. L. Zerga, 1983. Cultural Resources Overview for the Nevada Nuclear Waste Storage Investigations, Nevada Test Site, Nye County, Nevada, NVO-266, Nevada Operations Office, U.S. Department of Energy, Las Vegas.

- Quade, J., and J. V. Tingley, 1983. A Mineral Inventory of the Nevada Test, and Portions of the Nellis Bombing and Gunnery Range, Southern Nye County, Nevada, DOE/NV/10295-1, U.S. Department of Energy, Nevada Operations Office, Las Vegas.
- Reno, R. L., and L. C. Pippin, 1985. An Archaeological Reconnaissance of Yucca Flat, Nye County, Nevada, Technical Report No. 35, Desert Research Institute, Las Vegas, Nevada, pp. 99-110.
- Rogers, A. M., S. C. Harmsen, W. J. Carr, and W. Spence, 1983. Southern Great Basin Seismological Data Report for 1981 and Preliminary Data Analysis, USGS-OFR-83-669, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Rosenberg, N. J., 1974. Microclimate: The Biological Environment, John Wiley & Sons, New York.
- Rush, F. E., 1970. Regional Ground-Water Systems in the Nevada Test Site Area, Nye, Lincoln, and Clark Counties, Nevada, Department of Conservation and Natural Resources, Water Resources--Reconnaissance Series Report 54, State of Nevada, Carson City.
- Scott, R. B., and J. Bonk, 1984. Preliminary Geologic Map of Yucca Mountain, Nye County, Nevada, with Geologic Sections, USGS-OFR-84-494, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Spengler, R. W., F. M. Byers, Jr., and J. B. Warner, 1981. Stratigraphy and Structure of Volcanic Rocks in Drill Hole USW G-1, Yucca Mountain, Nye County, Nevada, USGS-OFR-81-1349, Open-File Report, U.S. Geological Survey, Denver, Colo.
- State of Nevada, ESD (Employment Security Department), 1984. Nevada Area Labor Review 1984, Economic Developments and 1985 Outlook, Carson City.
- State of Nevada, OCS (Office of Community Services), 1985. Nye County, Nevada Profile, 1985 Edition, Carson City.

- Thordarson, W., 1983. Geohydrologic Data and Test Results from Well J-13, Nevada Test Site, Nye County, Nevada, USGS-WRI-83-4171, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- United States v. Mary Dann and Carrie Dann, 1985. The United States Law Week, February 19, 1985, No. 83-1476.
- UNLV (University of Nevada Las Vegas), 1984. Las Vegas SMSA Study: Community Satisfaction and Educational and Political Attitudes, (computer printout), Department of Sociology, University of Nevada, Las Vegas.
- USGS (U.S. Geological Survey) (comp.), 1984. A Summary of Geologic Studies through January 1, 1983, of a Potential High-Level Radioactive Waste Repository Site at Yucca Mountain, Southern Nye County, Nevada, USGS-OFR-84-792, Open-File Report, U.S. Geological Survey, Menlo Park, Calif.
- Waddell, R. K., 1982. Two-Dimensional, Steady-State Model of Ground-Water Flow, Nevada Test Site and Vicinity, Nevada-California, USGS-WRI-82-4085, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- Waddell, R. K., J. H. Robison, and R. K. Blankennagel, 1984. Hydrology of Yucca Mountain and Vicinity, Nevada-California--Investigative Results Through Mid-1983, USGS-WRI-84-4287, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- Walker, M., 1985. Letter from M. Walker (Beatty Water and Sanitation District) to M. L. Brown (SAIC), November 5, 1985; regarding grant for engineering and hydrological study.
- Wilkinson, K. P., J. G. Thompson, R. R. Reynolds, Jr., and L. M. Ostresh, 1982. "Local Social Disruption and Western Energy Development, a Critical Review," Pacific Sociological Review, Vol. 25, No. 3, pp. 275-298.

Winograd, I. J., and W. Thordarson, 1975. Hydrogeologic and Hydrochemical Framework, South-Central Great Basin, Nevada-California, with Special Reference to the Nevada Test Site, U.S. Geological Survey Professional Paper 712-C, Washington, D.C.

CODES AND REGULATIONS

- 10 CFR Part 60 (Code of Federal Regulations), 1983. Title 10, "Energy," Part 60, "Disposal of High-Level Radioactive Wastes in Geologic Repositories," U.S. Government Printing Office, Washington, D.C.
- 10 CFR Part 960 (Code of Federal Regulations), 1984. Title 10, "Energy," Part 960, "General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories; Final Siting Guidelines," 49 FR 47714, Vol. 49, No. 236, December 6, 1984, pp. 47714-47769.
- 10 CFR Part 961 (Code of Federal Regulations), 1985. Title 10, "Energy," Part 961, "Standard Contract for Disposal of Spent Nuclear Fuel and/or High Level Radioactive Waste," U.S. Government Printing Office, Washington, D.C.
- 40 CFR Part 61 (Code of Federal Regulations), 1984. Title 40, "Protection of Environment," Part 61, "National Emission Standards for Hazardous Air Pollutants," U.S. Government Printing Office, Washington, D.C.
- 40 CFR Part 190 (Code of Federal Regulations), 1982. Title 40, "Protection of Environment," Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations," U.S. Government Printing Office, Washington, D.C.
- 40 CFR Part 191 (Code of Federal Regulations), 1985. Title 40, "Protection of Environment," Part 191, "Environmental Standards for the Management and Disposal of Spent or Nuclear Fuel, High-Level and Transuranic Radioactive Wastes: Final Rule," Federal Register Vol. 50, No. 182, September 19, 1985.

40 CFR Part 192 (Code of Federal Regulations), 1984. Title 40,
"Protection of Environment," Part 192, "Health and
Environmental Protection Standards for Uranium and Thorium
Mill Tailings," U.S. Government Printing Office, Washington,
D.C.

7 USC 4201-4209 (United States Code), "Farmland Protection
Policy Act," Public Law, Washington, D.C.

16 USC 1531 et seq. (United States Code), 1973. "Endangered
Species Act," Public Law, Washington, D.C.

C.5 POSTCLOSURE RADIOLOGICAL SAFETY

This section includes comments on the condition and performance of the repository over the long term, after it is closed and sealed. With the exception of issues related to climatic change and long-term site ownership, all comments address the geologic or hydrologic features of the site.

Comments in this category address the postclosure system guideline and all the suitability analyses for individual guidelines that support the evaluation of the system guideline. These include all analyses in support of the Environmental Protection Agency and Nuclear Regulatory Commission regulations governing the long-term performance of the repository (40 CFR Part 191 and 10 CFR Part 60). Many of these guidelines cannot be evaluated fully until after site characterization. This section, therefore, includes many comments that address some important data uncertainties about the repository system.

C.5.1 GEOHYDROLOGY

The geohydrology guideline addresses the present and expected characteristics of the geohydrologic setting of the site and related processes operating within this setting. The favorable, potentially adverse, qualifying, and disqualifying conditions establish the basis for determining if the geohydrologic characteristics and processes are compatible with waste containment and isolation. The 193 comments received in this category were divided into six issues: (1) General Comments and Challenges, (2) Travel-Time Calculations, (3) Flux Estimates, (4) Climatic Effects, (5) Unsaturated Zone Conditions, and (6) Saturated Zone Conditions.

Issue: General comments and challenges

Twenty-seven comments were received covering general concerns in geohydrology and challenging the adequacy of the data base that was available for evaluation of this guideline. The comments were subdivided into four topics: data adequacy, qualifying condition evaluation, site characterization, and miscellaneous.

Data adequacy. A few commenters questioned the approaches that will be used to test the applicability of conceptual models, to establish that appropriate field data will be obtained, and to maximize the utilization of the limited available data. Additional comments addressed the overall adequacy of the data base to support the conclusions reached in the Environmental Assessment (EA).

Response. The U.S. Department of Energy (DOE) intends to use computer models and professional judgment to refine and test conceptual models. As suggested in one of the comments, output from computer models is a valuable source of direction for future field-data acquisition. It is recognized that the DOE will need to establish by modeling and expert judgment that it has collected sufficient and representative data to support statistically valid conclusions. It is also recognized that a number of analytical approaches should be used in the case of a limited data base. This is exactly the

reasoning that has been applied to estimating flux in the unsaturated zone (see issue on flux estimates). On the question of the overall adequacy of the EA data base, it should be noted that Appendix III of 10 CFR Part 960 does not call for an unequivocal conclusion for qualifying and disqualifying conditions at the present stage of siting. Text changes have been made where appropriate to emphasize the uncertainties inherent in the data base, the conceptual models, and the resulting conclusions.

Qualifying condition evaluation. Some comments were directed at the qualifying condition for geohydrology, stating that evaluations are unsupported and misleading, that the appropriate conclusion would be that no information shows that the site is qualified, or that data are insufficient to draw any meaningful conclusions.

Response. The basis for a preliminary finding that a site may be nominated and recommended for characterization is reviewed in the first response under this issue, and is taken from Appendix III of the DOE siting guidelines. The DOE has evaluated the Yucca Mountain site against the technical guidelines, as required by 10 CFR Part 960, and has reached conclusions of site suitability on the basis of available evidence and best scientific judgment. Text changes throughout Chapter 6 of the final EA have been made to incorporate explicit statements of uncertainty where appropriate. The DOE agrees that information is insufficient to demonstrate that the site is qualified. This decision must await site selection. However, the evidence also does not indicate that the site is not qualified, which is the appropriate finding for the nomination and recommendation of a site for site characterization.

Site characterization. Questions were received relating to site characterization, noting that site-specific data are needed to apply regional models with reasonable certainty to site conditions and processes. It was suggested that future characterization may not change the finding on the third favorable condition, which presently concludes that the site cannot be readily characterized and modeled with reasonable certainty. Several commenters pointed out weaknesses in the brief section entitled "Plans for Site Characterization", specifically noting the difficulties in characterizing the vadose zone. Two commenters requested that some quantitative measures of the amount of investigation that has been conducted be added to the EA.

Response. The DOE recognizes that site characterization could lead to changes in the findings on the technical guidelines. Reevaluation after site characterization is explicitly required for the qualifying and disqualifying conditions by 10 CFR 960.3. The need for more site-specific data to refine and test conceptual models and to apply regional models to site-specific problems is recognized (see the first response under this issue). All aspects of vadose zone hydrology, including fracture flow under saturated conditions, will be studied during site characterization by field testing, in situ testing, laboratory experiments, and numerical analyses and simulations. Information pertaining to the types of site investigations conducted to date are covered as part of the discussion in Section 6.3.1.1.2 and in relevant data sections of Chapter 6. Data from these investigations that were relevant to and representative of site conditions and processes were used in evaluating the suitability of the site for characterization.

Miscellaneous. The miscellaneous comments addressed concern about public health and safety, the conservatism of conclusions regarding behavior of natural barriers at the site, a question of the need for engineered barriers, and the need for an expanded discussion of the basic premises that underlie unsaturated zone disposal.

Response. The DOE is required to meet the requirements of the DOE siting guidelines, the Nuclear Regulatory Commission (NRC), and the Environmental Protection Agency. These requirements should adequately ensure the protection of public health and safety. Although engineered barriers are not used in the evaluations of technical guidelines in support of site suitability, they are to be considered in order to establish that the presence of engineered features will not degrade performance of natural barriers. It should also be noted that the NRC requirement for substantially complete containment for 300 to 1,000 years is intended to ensure that the most hazardous materials, which are present early in the decay process, have been reduced to low levels if and when the period of controlled release begins. The DOE has taken a conservative position in the preliminary assessment of performance. It is recognized that further data and analysis are needed to assess repository performance with the level of confidence eventually required by the NRC.

The basic premises regarding unsaturated zone disposal are covered as part of the discussion in the postclosure system guideline, Section 6.3.2.2.1, except for the point mentioned in the comment that dilution of vadose water by the larger quantities of water in transit in the saturated zone should be considered in the overall evaluation. This aspect of isolation which is provided by the unsaturated zone will be further evaluated as flow paths are better defined during site characterization.

Issue: Travel-time calculations

Forty-four comments were received addressing various aspects of the travel-time calculations that support the evaluation of the disqualifying condition and the first favorable condition. These comments were subdivided into the following topics: challenges to travel times, uncertainties in calculations, and isotope ages of ground water.

Challenges to travel times. Numerous comments contained specific challenges to the DOE conclusions that the travel time from the disturbed zone to the accessible environment exceeds 1,000 years, as required by the disqualifying condition, and that the travel time; in fact, exceeds 10,000 years, as required for claiming the first favorable condition. Several of the commenters challenged the use of 1 millimeter (0.04 inch) per year as the likely flux, and requested that ranges of values for flux and other hydrologic properties and parameters be used to establish a range of travel times that include fracture-flow scenarios. Given the uncertainty and variability in many of the properties and parameters and the absence of critical data, several commenters stated that little confidence should be placed in calculated travel times and, further, that claims of conservatism are unjustified. An alternative travel-time calculation is provided in one of the comments, and results of this calculation were used to claim that the travel time may be less than 1,000 years.

Response. The draft EA text in Section 6.3.1.1 has been revised to include discussion of uncertainties related to travel-time calculations. Section 6.3.1.1.5 has been revised, and total travel-time distributions for the upper bound on expected flux of 0.5 millimeter (0.02 inch) per year are given. The travel-time calculations provided in one of the comments were based on estimated variability in measured hydrologic parameters, whereas the revised travel-time calculations in Section 6.3.1.1.5 are based on random sampling of hydrogeologic parameters for many 10-foot-thick elements in each hydrogeologic unit. The means and standard deviations for effective porosity and saturated matrix conductivity for the hydrogeologic units considered in the travel-time calculations are also presented in the revised text in Table 6-17.

For purposes of calculating travel times, the three-dimensional volume of each hydrogeologic unit beneath the repository area was subdivided into vertical columns and then further subdivided into 10-foot-thick increments. Particle velocity for each element within a hydrogeologic unit was determined by randomly sampling a value of saturated hydraulic conductivity from a range of values appropriate for that unit. This form of random sampling is referred to as random field sampling; the probability of selecting a given parameter value is determined by the shape of the frequency distribution for that parameter. The selected conductivity value was compared with the flux to determine whether flow was through the matrix or through fractures. If the flow was found to be through the porous rock matrix, a particle velocity was calculated by dividing the flux value by a randomly selected value for effective porosity. If the flow occurred through fractures, the velocity of flow was determined by dividing the calculated value of flux in the fractures by 0.0001, the assumed effective porosity for all fracture flow in the unsaturated zone. The portion of flux remaining in the matrix and this value were used to obtain a matrix flow time as well as a fracture flow time for each element characterized by fracture flow. This procedure was repeated for each 10-foot-thick element within each of 963 vertical columns. The sum of all individual element travel times through each column represents one realization of total travel time. The procedure was repeated 10 times for each column to give a representation of the variation in travel time due to the uncertainty from sampling of hydraulic parameters. Results are shown as a total travel-time histogram and cumulative frequency curves for each hydrogeologic unit.

An alternative approach to the calculation of travel times is also presented in Section 6.3.1.1.5, whereby one value of conductivity and effective porosity was sampled for the entire thickness of each column in each hydrogeologic unit. This approach yields higher, but probably physically unrealistic, estimates of the probability of continuous fracture flow and rapid matrix flow than the sampling method just described, which more realistically accounts for vertical as well as horizontal variation in the hydraulic parameters. The results for this highly conservative alternative approach are included in the text to indicate the potential isolation qualities provided by the rock due to variations in hydrologic parameters in the vertical direction and to acknowledge travel times that could occur in the highly unlikely event that fracture flow were sustained throughout continuous vertical paths within each hydrogeologic unit.

The assumptions underlying these travel-time calculations are that unsaturated zone flux below the disturbed zone is vertical and uniformly distributed in time and space, the hydraulic gradient in the unsaturated zone is unity (only vertical flow occurs), the effective hydraulic conductivity through the matrix of any given rock volume is equal to the flux (i.e., the saturation adjusts to a conductivity exactly sufficient to pass the flux), and that water does not flow through fractures until flux reaches about 95 percent of the saturated matrix conductivity. Given those assumptions, particle velocity is simply flux divided by effective porosity.

The travel time in the saturated portion of the flow path is calculated for a distance of 5 kilometers (3 miles), using a hydraulic gradient of 3.3×10^{-4} , which was derived from water level measurements.

In the case of the disqualifying condition (10 CFR 960.4-2-1), the requirement is that "... the pre-waste-emplacement ground-water travel time from the disturbed zone to the accessible environment is expected to be less than 1,000 years along any pathway of likely and significant radionuclide travel." Because this condition is a restatement of the travel-time requirement from 10 CFR Part 60, a recent clarification of the NRC performance objective should be noted. A letter from the NRC to the DOE (Browning, 1985) states that the "likely" modifier in the NRC performance objective anticipates that theoretically possible, but extremely unlikely, paths will be excluded when determining whether the performance objective has been met.

Considering the evidence available to date for the pre-waste-emplacement travel times at Yucca Mountain, the mean unsaturated zone travel time is about 43,000 years; the range of unsaturated zone travel times is estimated to be from 9,345 to 80,095 years. Adding the 5-kilometer (3-mile) saturated zone travel time gives a minimum travel time of 9,485 years and a maximum travel time of 81,235 years. These travel times are given in Section 6.3.1.1.5; they demonstrate that the Yucca Mountain site meets the requirements for not being disqualified with respect to the geohydrology disqualifying condition.

For the first favorable condition, the evaluation is to be for "... any path of likely radionuclide travel". This condition does not specify that significant quantities of radionuclides are likely to follow the path. Therefore any path that could transport radionuclides must be considered in this evaluation. As stated above, the range of travel times is between 9,485 and 81,235 years; only one realization out of 9,630 realizations of the travel time model produced a travel time less than 10,000 years. The favorable condition is therefore judged to be present.

Uncertainties in calculations. Many comments were received regarding various aspects of uncertainty on the parameters used to calculate travel times; they suggested that further studies are necessary to adequately characterize both unsaturated and saturated conditions. Several commenters suggested that a range of saturated zone travel times should be calculated because of simplistic models and paucity of appropriate data. Other commenters pointed out that uncertainties in flux estimates should be stated and the potential effects of higher fluxes should be considered. Effective porosities and hydraulic conductivities in the EA were noted to be provided as single or mean values, with no ranges given and no explanation of why

these values were judged to be conservative. One commenter noted that the degree of saturation was not taken into account for travel-time calculations, and another noted that the cross-over point between matrix and fracture flow cannot be predicted at current levels of understanding. One commenter noted that specific NRC siting regulations have not been met; another noted confusion over the manner in which the disturbed zone was defined in the EA. The possibility for rapid water flow through fractures was mentioned in several comments, and one commenter suggested that the overall uncertainty in estimates of travel time must be the additive uncertainty in all of the parameters used to calculate travel time. Two commenters stated that it would be useful to include the effects of heat in the ground-water travel time estimates.

Response. The DOE agrees that further studies are required to adequately characterize the unsaturated and saturated zones at Yucca Mountain. Various surface and in situ experiments and tests will be conducted during site characterization to attain this goal. The final EA considers a range of effective porosities and saturated hydraulic conductivities in the unsaturated zone travel-time calculations presented in Section 6.3.1.1.5. The text has been revised to convey more accurately the basis for using an upper bound on flux of 0.5 millimeter (0.02 inch) per year for the unsaturated zone travel-time calculations. A flux value of 1.0 millimeter (0.04 inch) per year was also considered in estimating travel times to adequately take into account the potential impacts of a higher flux. The current ranges of effective porosity and saturated hydraulic conductivity for each hydrogeologic unit are provided in Section 6.3.1.1.5 (Table 6-17), along with references to the sources of the values. The DOE disagrees that degree of saturation was not taken into account for travel-time calculations, because estimates of effective porosity took into account the estimated percent of voids drained.

With regard to the comment that cross-over points between fracture and matrix flow cannot be predicted, a recent computer simulation study by Wang and Narasimhan (1985) developed a statistical theory to describe flow along and across fractures that separate partially saturated matrix blocks. Their simulations indicate that fluid flow in a partially saturated, fractured, porous rock unit can be simulated approximately without taking fractures into account. However, to simulate the response of this rock unit to non-steady-state fluid flow that included sufficient flux to induce some fracture flow would require characterization and simulation of fracture network geometries and knowledge of discrete fracture characteristics. This detailed fracture information would be very difficult to obtain.

The comment noting that the NRC siting regulations have not been met illustrates a misconception about the purpose of the EA. NRC requirements for siting will not be applied until licensing interactions between the NRC and the DOE are in process for a potential repository. The purpose of Chapter 6 of the EA is to provide a detailed statement of the basis for nominating a site as suitable for characterization, as required by the Nuclear Waste Policy Act (NWPA, 1983).

Final definition of the boundaries of the disturbed zone will not occur until further understanding of the perturbing effects of a repository have been developed. For purposes of calculating travel times, the assumed

position of the disturbed zone is 50 meters (164 feet) below the centerline of the repository, and it is thought to be unlikely that repository-induced changes beyond these distances could significantly affect repository performance. In the calculations of travel time and in computer simulations of travel times, the possibility for rapid water velocities during fracture flow is explicitly considered. On the question of additive uncertainties, the final EA discussions of travel time clearly describe uncertainties in the calculations. However, it should be noted that extreme application of this philosophy can lead to totally unrealistic predictions that are far removed from the expected conditions and processes.

Heat effects on rock properties that might influence postclosure travel times will be studied during site characterization through performance assessment scenario analysis. The disqualifier for geohydrology is for pre-emplacement travel time and heat is not appropriately considered for that calculation.

Isotope ages of ground-water. Commenters questioned the absence of data from established isotope techniques for dating water and determining travel times. It was suggested that tritium levels could be used to estimate the period of time that water had been out of contact with the atmosphere. Using this approach, one commenter suggested that several wells in Fortymile Wash may contain water components as young as 30 years old. It was further suggested that carbon-14 ages may indicate rapid ground-water movement or substantial recharge through Yucca Mountain. One commenter suggested that travel velocities in fractures within the Rainier Mesa vadose zone have been estimated at meters per day, and further stated that the presence of 10,000-year-old ground waters at Yucca Mountain indicates that either the carbon-14 ages are wrong or the travel-time estimates are off by about a factor of 2. Another commenter combined a question of ground-water age estimates with a statement that no evidence was offered to support the conservatism of placing the disturbed zone at the base of the Topopah Spring welded unit.

Response. Isotope ages for ground water are reported by Claassen (1983); Benson et al. (1983); and Waddell et al. (1984). Tritium data mentioned in the comments may indicate a "soil-water" contribution, although obtaining uncontaminated samples has been difficult in the past and results are not definitive. Claassen (1983) suggests that a major recharge event between 9,000 and 17,000 years ago can be detected by use of carbon-14 ages. The comment regarding the possibility of rapid recharge at Yucca Mountain does not consider the fact that a 10,000-year-old carbon-14 age represents a minimum age for the water. The possibility of mixing of water of different ages, and of the occurrence of local recharge events beneath intermittent streams, makes the isotope age-dating technique an inexact science. Use of corrected carbon-14 ages must contain specification of the correction method used, because no unique solution is possible. A lack of agreement between hydraulically computed velocities and geochemically computed velocities is not surprising. The assumptions are different, and it may be erroneous to assume that water sampled down the hydraulic gradient from another sampling locality is necessarily derived solely from the up-gradient sample. As a result 10,000-year-old water at Well J-13 and a calculated 20,000-year travel time from the repository to the water table are not necessarily contradictory.

Rapid travel times in other layered volcanic sequences are possible, depending critically upon the infiltration and the current degree of saturation. In the case of Rainier Mesa, elevations are 2,250 to 2,340 meters (7,380 to 7,675 feet) (White et al., 1980), whereas the elevation at Yucca Mountain is about 1,500 meters (4,920 feet). Using tables in Czarnecki (1985), recharge at Rainier Mesa would be expected to be at least 7 percent of the annual precipitation, which is currently about 200 to 300 millimeters (7.8 to 11.7 inches) (Figure 7, Czarnecki, 1985). Recharge at Rainier Mesa is probably a minimum of 50 millimeters (2.0 inches) greater than average precipitation at Yucca Mountain; an upper bound on recharge at Yucca Mountain is estimated to be 3 percent of precipitation.

The critical factor regarding travel times in partially saturated, fractured, porous tuff is clearly indicated on the simulations reported by Wang and Narasimhan (1985) and a comparison of degree of saturation in the two tuff settings. Zimmerman (1983) reports that saturation at depth in a welded tuff unit at Rainier Mesa is 95 percent, whereas average saturation in the welded Topopah Spring Member at similar depths at Yucca Mountain is 65 percent (Montazer and Wilson, 1984). Wang and Narasimhan (1985) show that at points near full saturation, the role of fractures is critical in modeling fluid velocities. They point out that vertical velocities in fractures increase rapidly and peak just before the fracture becomes desaturated. After the fractures desaturate, velocities can be approximated by a porous matrix velocity. These results indicate that at higher degrees of saturation, as is the situation at Rainier Mesa, rapid fracture flow is very probable. All evidence to date suggests that very limited fracture flow occurs within the Topopah Spring welded unit under current conditions, although some fracture flow may occur when lateral flow carries excess net infiltration to structural features (Montazer and Wilson, 1984).

The comment on the conservatism of the position of the disturbed zone is covered under the immediately preceding response.

Issue: Flux estimates

Twenty-seven comments were received regarding the approaches for estimating fluxes, the uncertainty of current flux estimates, and the validity of the conceptual model for unsaturated flow. The comments have been subdivided into the following topics: unsaturated zone conceptual model and current flux estimates.

Unsaturated zone conceptual model. Several comments addressed aspects of the conceptual model for the unsaturated zone developed by Montazer and Wilson (1984). Two commenters suggested that the model is treated as though it has been verified and that data are insufficient to reach this conclusion, particularly because other models could be developed. Another commenter suggested that fracture flow is plausible in the densely welded units, although available data are insufficient to resolve this question. Two commenters point out field data for the vitric Calico Hills nonwelded unit that is judged to conflict with predictions of the conceptual model. Other commenters questioned the validity of the capillary-barrier concept.

Response. Text in the EA has been revised to explain how computer modeling will be used in an iterative fashion to refine and test conceptual

models as more data are obtained during site characterization. Given the current understanding of unsaturated flow, the conceptual model is judged to be sufficiently flexible to accommodate improved understanding of the unsaturated zone. If found to be invalid, the conceptual model will be revised.

The DOE believes the concepts of lateral flow, permeability barriers, and capillary barriers are supported by available field data and preliminary results of modeling. The EA text has been revised to elaborate on the evidence that supports this conclusion and to provide additional references. It is not correct, as stated in one of the comments on this topic, that the flux entering through the Tiva Canyon Member must equal the recharge beneath the primary repository area. As discussed in Montazer and Wilson (1984), lateral diversion to bounding faults may cause very limited recharge directly beneath the primary repository area. A higher degree of saturation in the lower Calico Hills nonwelded unit could result from capillary forces drawing water upward from the water table. In addition, water contents reported for the Calico Hills are from both the saturated and unsaturated zones. All of the reported unsaturated zone cores were drilled with foam or water. Preliminary results to date suggest that neither wet- nor dry-drilling methods cause significant changes in water content of core samples. The Calico Hills vitric facies is underlain by a thick zeolitic facies throughout the primary repository area (Montazer and Wilson, 1984) although in part of the area, the zeolitic facies is in the saturated zone. Travel-time calculations are provided for both the vitric and zeolitic Calico Hills units in Section 6.3.1.1.5 of the EA.

The DOE acknowledges that direct evidence is currently lacking to support the concepts of permeability and capillary barriers. Evidence of very low flux in the Topopah Spring unit (Montazer et al., 1985) combined with estimates of higher values of regional recharge fluxes support the concept of lateral flow and the probable effectiveness of the capillary barriers. Perched water is not required for lateral flow to occur, as was suggested by several commenters.

Current flux estimates. Numerous comments addressed aspects of the evidence supporting the current flux estimates for Yucca Mountain. The nature of the contact between the Topopah Spring welded unit and the Calico Hills nonwelded unit was questioned, as was the support for the statement claiming there is no evidence for fracture flow in the host rock. One commenter suggested that authigenic minerals in fractures provide indirect evidence for fracture flow. The long-term constancy of flux was challenged as well as the lack of consideration of future possible higher infiltration rates. Current flux estimates were challenged as unsupported or poorly supported, and it was noted that the vadose zone has not been adequately characterized, particularly with regard to the potential for retardation. Uncertainties in infiltration estimates were noted as an additional source of uncertainty in flux. One commenter noted that because the site cannot presently be readily characterized and modeled with reasonable certainty, there is no proof that future studies will reach this goal, and that other conclusions are weakened by this fact. One commenter pointed out that if current flux estimates were established to be too low, then travel times may

not meet the 1,000-year requirement. It was also noted that fracture flow can occur at almost all stages of saturation, according to Montazer and Wilson (1984), and that the proposed model is not the only reasonable description of available information.

Response. Using various lines of evidence, the DOE has concluded that the downward flux in the host rock probably is less than 0.5 millimeter (0.02 inch) per year. The conclusion is based on information presented in Wilson (1985). The DOE has revised Section 6.3.1.1.5 of the EA to convey more accurately the basis for the estimate of flux and has included statements concerning the degree of uncertainty.

According to the conceptual model (Montazer and Wilson, 1984), little if any flow occurs in the fractures of the lower part of the Topopah Spring welded unit and flow probably enters the Calico Hills unit from the matrix. The nature of flow at the contact between the Topopah Spring and Calico Hills units depends on whether the vitric or zeolitic facies of the Calico Hills nonwelded unit are present. The pore sizes of the vitric facies are much larger than those of the matrix of the Topopah Spring unit and may result in a capillary barrier where those units are in contact. Conversely, the pore sizes of the zeolitic facies are about the same as for the matrix of the Topopah Spring unit, resulting in continuity of matrix flux across the contact. Flux within the Calico Hills nonwelded unit probably occurs with some lateral component of down-dip flux because of the existence of layers with contrasting hydraulic conductivity in the unit. Water that flows down dip along the top of the Calico Hills nonwelded unit slowly percolates into this unit and slowly diffuses downward. This down-dip flow probably persists for longer distances along the upper contact of the zeolitic facies, which has less permeability than the vitric facies. In either case, flux into each facies is more or less distributed evenly. Fracture flow may occur within the uppermost layers of the Calico Hills unit, but diffusion into the matrix probably removes the water from the fractures deeper in the unit, and flow becomes limited mostly to within the matrix except along the structural flowpaths, according to the conceptual model of Montazer and Wilson (1984).

Theoretical curves presented in Montazer and Wilson (1984) indicate that fracture flow can occur even at low saturations; however, fracture flow under such conditions is likely to occur only along fracture walls and would be at velocities similar to matrix flow. Although the DOE believes matrix flow also is predominant in the welded units under current values of flux, travel-time calculations in the final EA (Section 6.3.1.1.5) consider both matrix and fracture flow in all units depending upon the ratio of saturated matrix conductivity to the flux value, as described in the first response under travel-time calculations.

The DOE agrees that the unsaturated zone has not been adequately characterized to date, and many in situ, surface-based, laboratory, and numerical tests and experiments are planned during site characterization to remedy this situation. The DOE believes that the level of understanding will be sufficient to model and describe the processes with reasonable certainty after site characterization.

Travel-time calculations are based on what the DOE believes to be conservative values of percolation through the host rock. Revised Section 6.3.1.1.5 of the final EA includes calculations for an upper bound on expected flux of 0.5 millimeter (0.02 inch) per year, and for 1 millimeter (0.04 inch) per year to take into account the unlikely scenario of flux values twice the current recharge estimate beneath Yucca Mountain. An evaluation of the appropriateness and degree of conservatism of the flux estimates is also included in the EA. Effects of higher percolation rates expected during pluvial times are not appropriate for calculations of pre-waste-emplacement travel times. In addition, evidence from authigenic minerals about fracture flow may represent previous high levels of the water table or may represent near-surface deposition in the pedogenic zone (Vaniman et al., 1985).

Geochemistry of the vadose zone is covered in EA Section 6.3.1.2 and in Section C.5.2 of this document. The DOE position is that some retardation will occur due to sorptive zeolites and matrix diffusion, even under conditions of fracture flow. For a discussion of comments on the 1,000-year travel time, see the second issue in this section, which covers travel-time calculations.

Issue: Climatic effects

Nineteen comments were received regarding the question of how climatic change will affect specific aspects of site suitability related to the geohydrology technical guideline. A number of other comments on climatic change are covered in Section C.5.4 of this document. One commenter stated that the effects of future climatic changes on flux rates, development of perched water, and radionuclide travel times have not been adequately addressed to date. Several commenters questioned the DOE claim that the nature and rates of expected climatic effects would not significantly affect isolation over the next 100,000 years, and suggested that a topic should be added to the first potentially adverse condition to explicitly cover "... changes in elevation of the water table." It was also suggested that expected pluvial conditions, which could increase flux by a factor of 15, indicate that the first potentially adverse condition is present at Yucca Mountain. Several commenters challenging this condition suggested that reliance on retardation under conditions of increased recharge and fracture flow is not warranted. One commenter suggested that current conditions at Rainier Mesa that cause significant fracture flow are probably not unlike those that would exist at Yucca Mountain during a pluvial period. Several commenters questioned the approach used to estimate precipitation-recharge relationships by Czarnecki (1985), noting that expected infiltration in Fortymile Wash is critical in determining water-table levels, and that recharge estimates are tenuous and not valid for site-specific applications. It was also noted that the evaluation of climatic effects did not adequately cover shortened flow paths and the potential for perched zones and springs. Several commenters also offered corrections to factual errors in the text.

Response

The DOE acknowledges that key licensing issues have not been resolved to date. Except in the case of issues that require no site characterization, this would not be expected nor would it follow the intent of the Nuclear

Waste Policy Act (NWPA, 1983). Preliminary site suitability evaluations to support nomination for site characterization is the first step.

The DOE agrees that a return to pluvial conditions could result in geohydrologic changes, namely increased recharge, rising water table, possible fracture flow, and changed gradients and flow paths in the saturated zone. What is not understood at this time is what effects these changes would have on percolation through the Topopah Spring welded unit host rock (i.e., how effective capillary barriers and lateral flow would be at diverting the increased infiltration and maintaining low fluxes through the host rock within the repository block). Furthermore, even if direct sorptive effects are reduced under fracture-flow conditions, matrix diffusion may still provide an effective retardation factor of 400 (Travis et al., 1984). The EA was revised to include an assessment of the effects of changes in water-table elevations based on computer simulations (Czarnecki, 1985), and a discussion of uncertainty in the predicted water table altitude was also added.

The estimate of an increase in flux by a factor of 15 corresponds to a 100-percent increase in precipitation that was used by Czarnecki (1985), based on field studies by Spaulding et al. (1984). The EA points out that up to two-thirds of the increased precipitation may, in fact, become run-off rather than net infiltration. A detailed discussion of the potential similarities and differences between Rainier Mesa and Yucca Mountain is provided in the third and final response under the travel-time calculations issue in this section. There it is noted that the role of fracture transport is critically dependent upon the degree of saturation, and it is unknown whether the host rock and underlying units at Yucca Mountain would reach the current high saturations (greater than 95 percent) observed at Rainier Mesa under expected future pluvial conditions.

The precipitation-recharge relationship used by Czarnecki (1985) is regional, as noted in the comments. However, the Yucca Mountain site is included in the original region over which recharge was estimated by Rush (1970). Therefore, the site-specific application may be more reliable than suggested by the comments. Discussions in the final EA text more clearly specify the uncertainties in recharge estimates and predictions of water-table changes.

It is true that discharge points could occur at some location upgradient from existing discharge points, under conditions of increased recharge (Czarnecki, 1985). However, these points would still be beyond the boundary of the accessible environment, and thus per se would not affect transport of radionuclides to the accessible environment. Perched water tables and springs are not considered likely at the repository level or above. This is in part due to the presence of vitric pumice which is unlikely to have remained unaltered if past moisture conditions were near saturation. Preliminary conclusions are that the travertine and opal observed in fault traces near Yucca Mountain are unrelated to hot spring activity (Vaniman et al., 1985). The EA text corrections in response to comments include several conversion errors in the predicted water table increase, and a change in wording in Section 6.3.1.1.6 to indicate that 130 meters is not a "small" change.

Issue: Unsaturated zone conditions

Fifty comments were received on the issue of unsaturated zone conditions. A number of these comments questioned the concept of free drainage in the unsaturated zone, as well as the evidence for lateral diversion. Uncertainties on measurements and estimates of hydrologic conditions were also the subject of a number of comments. The comments were subdivided into the following four topics: free drainage, infiltration estimates, hydrologic conditions, and corrections and clarifications.

Free drainage. Several commenters questioned aspects of the evidence for free drainage in the host rock. A number of commenters questioned the relationship between air and rock-mass permeabilities; several additional commenters claimed that core analysis results provided by Weeks and Wilson (1984) show that the matrix does not drain, and that apparent perched water encountered in boreholes also suggests that the rock does not drain freely. Four commenters noted confusion over the question of the favorability of free drainage, particularly pointing out that free drainage of radionuclide-bearing water would be highly unfavorable. Several commenters also pointed out that to get free drainage, fracture flow is required, with fluxes in excess of 1 millimeter (0.04 inch) per year for the host rock. In this case, free drainage would lead to short travel times to the accessible environment.

Response. The concept of free drainage is confusing in Chapter 6 of the EA. In the geohydrology guideline (Section 6.3.1.1.3), one of the favorable conditions that is noted for unsaturated zone disposal is free drainage. However, in Section 6.3.1.3.3 on rock characteristics, fracture development that could enhance free drainage is not a favorable condition. It is clear that the difference should be related to whether the freely draining water has contacted the waste and picked up radionuclides. If the free drainage limits the potential contact time of water with the waste, it may serve to limit the amount of radionuclides that can be transported. Alternatively, if the free drainage could in some manner occur after the water has reached saturation with radionuclides, then the effect is clearly unfavorable.

Montazer and Wilson (1984) discuss the measurements of air permeability and reference Montazer (1982) for a complete explanation of the relationship of air permeability measurements to bulk hydraulic conductivities. Free drainage must be evaluated at several scales. Weeks and Wilson (1984) may indicate that the matrix does not drain as suggested in the comment; however, this is for an assumption of unit hydraulic gradient. Presumably the matrix is freely drained as long as gravitational or potential forces overcome capillary-attraction forces.

The EA text has been revised to discuss more fully the evidence regarding free drainage of the host rock. The DOE believes that the general nature of the host rock indicates that the capacity for free drainage exists beneath the repository block. This conclusion is supported by data from borehole USW UZ-6, which was drilled dry and showed no perched water in the host rock. The perched water that was encountered in USW UZ-1 was contaminated with drilling fluid, most likely to have come from USW G-1, which was only about 305 meters (approximately 1,000 feet) away (Henderson and Benson, 1983; Whitfield, 1985). Boreholes USW H-1 and USW UZ-1 are at the margin of the repository block, in a setting where perched water might be

encountered according to the conceptual model. The DOE believes that a time element should be incorporated into the concept of free drainage; if drilling fluid is introduced, some time will be required for the water to drain away, even under free drainage conditions. In the final EA, the DOE does claim the subcondition for free drainage.

Infiltration estimates. Estimates of and methods used to estimate infiltration were questioned in six comments. Several commenters pointed out that high-intensity, short-duration storms and winter snows produce infiltration, some part of which is not lost through evapotranspiration. Several commenters also pointed out that direct measurements of infiltration have not been made at Yucca Mountain and that the DOE should have specific plans as to how this data will be obtained. The Rush (1970) statement that approximately 3 percent of precipitation is expected to provide recharge was challenged. Absence of springs and seeps along washes as evidence for little or no interflow was challenged as negative evidence.

Response. The EA text in Section 6.3.1.1.3 has been revised to clarify the statements on potential evapotranspiration and infiltration. The DOE acknowledges that direct evidence is lacking to support infiltration estimates at this time. Better estimates of infiltration will be available during site characterization in the exploratory shaft. Plans for determining infiltration will be described in Chapter 8 of the Site Characterization Plan. The Yucca Mountain site has been subjected to a number of geological and environmental field surveys; springs or seeps that are the result of interflow of any significant duration would have been discovered.

Hydrologic conditions. Thirteen commenters addressed various aspects of the variability and uncertainty in hydrologic conditions in the unsaturated zone. Comments were received questioning the evidence for degree and constancy of saturation; the evidence for low and downward hydraulic gradient; the evidence for effective permeability; the evidence for diversion of downward percolation causing lateral flow; the role of discrete fault zones in fluid transport; the evidence for capillary barriers; the evidence for the capillary fringe; and the estimates of effective porosity.

Response. Variability in reported saturations is, in part, due to measurement errors that result from measuring moisture content in low-porosity rocks. As the water table or low permeability barriers are approached, local changes in saturation are likely to occur. The subcondition in Section 6.3.1.1.3 on constancy of saturation is assumed to apply to spatial variability rather than constancy of saturation through time. References to paleohydrology were deleted in the final EA text. It is agreed that the terms "dry unsaturated zone" should not be used, and the final EA has been revised to reflect this point. The DOE also agrees with the comment that drilling fluids should not be used in boreholes that are to provide moisture content data. However, several recent unsaturated zone holes were vacuum-air drilled, and preliminary results suggest the introduction of drilling fluids in the past have not caused significant changes in moisture conditions of the matrix. For comments pertaining to favorable condition 4, all text supporting the subconditions has been deleted because this condition explicitly pertains to saturated zone disposal only. Comments regarding low and downward hydraulic gradient and effective porosity in the host rock and surrounding units are in this category.

The minimum distance between the top of the Calico Hills nonwelded unit and the water table is about 30 meters (about 100 feet). Above this unit is the Topopah Spring welded unit; and it is considered unlikely that capillary rise in the fractures of the welded unit would extend more than a few centimeters (Montazer and Wilson, 1984). Therefore, the question of the extent of the capillary fringe must specify whether the fringe is in the matrix or in the fractures. Discussions of effective permeability and lateral diversion in Section 6.3.1.1.3 have been revised to reflect a comment that a pulse of infiltration may induce lateral flow at welded-nonwelded contacts because air becomes trapped in the nonwelded unit and decreases its effective permeability to water.

It should be noted that full or near saturation is not required for lateral flow, particularly when the flow is driven by gravitational forces. There is no direct evidence yet for permeability and capillary barriers. However, the estimates of average recharge are much greater than can be accounted for by the matric potential in the Topopah Spring welded unit, suggesting that lateral flow has diverted some flux so that it does not reach the Topopah Spring welded unit.

The DOE acknowledges that the Ghost Dance Fault may serve as a conduit for downward flow, although current flux conditions in the Topopah Spring Member do not appear to support extensive fracture flow. In fact, Montazer et al. (1985) report that field evidence suggests an upward component of vapor flux rather than downward moisture flux which may exist in the fractures on the Topopah Spring welded unit. Hydrologic characteristics of the fault will be assessed during site characterization.

Corrections and clarifications. Discrepancies in EA text were noted in a number of comments under this issue. Two commenters mentioned an omission of the consideration of thermal effects in the fluid flow regime under the first potentially adverse condition. Several commenters suggested text corrections and noted missing references and incorrect citations.

Response. The first potentially adverse condition applies to expected changes in hydrologic conditions that are not induced by the repository. Thermally induced changes are covered in Section 6.3.1.3 on rock characteristics. The discussion of favorable condition 4 in Section 6.3.1.1.3 has been deleted because this condition applies to saturated disposal only. Omitted text from Section 6.3.1.1.3 in the discussion of diversion of infiltration has been added, and the meaning of this section has been clarified. During revision of the calculation of travel times, errors were corrected in Section 6.3.1.1.5. Incorrect citations in the EA text to statements regarding limited infiltration and recharge in Quiring (1965) and Winograd and Thordarson (1975) have been corrected.

Issue: Saturated zone conditions

Twenty-six comments were received addressing questions about saturated zone conditions at Yucca Mountain. These comments covered a number of different subjects and were subdivided into the following topics: water table, role of fractures, evidence from springs, and corrections and general comments.

Water table. A few commenters noted that a fracture flow system could produce a water table surface with abrupt changes in elevation, making it difficult to characterize and model. It was suggested that use of average hydrologic parameters in this type of system could cause large errors in travel-time estimates.

Response. The DOE agrees that a fracture-flow ground-water system does not necessarily produce a smooth water table, and the description of the potentiometric surface has been qualified in the EA text. Models are being improved to better represent expected conditions at the Yucca Mountain site. Data will be collected during site characterization to test and refine the models.

Role of fractures. Commenters questioned the effects of unidentified subsurface fracture zones and the impact of dissimilarity between surface and subsurface fracture characteristics.

Response. In general, fracture orientations in the subsurface are in good agreement with surface fracture orientations (USGS, 1984). This statement is also true with regard to the orientation of faults that indicate the most recent movement. It is expected that some fault planes become less steep with depth; this can lead to lack of correlation of surface and subsurface data unless changes in orientation with depth can be predicted. Nonwelded units also tend to behave differently from more brittle welded units and therefore smaller features such as cooling joints are unlikely to be continuous.

Evidence from springs. Some commenters suggested the existence of deep-circulating springs or seeps in the Yucca Mountain area, and one commenter requested information about potential mixing between aquifers.

Response. No springs are currently known to occur near Yucca Mountain or within a 10-kilometer (6-mile) radius of the site. Regional and local heat flow is relatively well studied, and extreme anomalies are not observed. The possibility that carbonate deposits located in trenches represent spring deposits is under investigation; however, preliminary conclusions are that these deposits formed at or near surface temperature and that their formation is related to pedogenic processes (Vaniman et al., 1985). Only one data point is available to indicate the possibility for mixing of deep and shallow aquifers. Waddell et al. (1984) reports that the head in the deeper carbonate aquifer is about 20 meters (66 feet) higher than in the overlying tuff aquifer at Well UE-25p#1, indicating flow would be from the deeper aquifer to the shallow aquifer at this location on the east side of Yucca Mountain.

Corrections and general comments. Several commenters addressed general questions regarding the saturated zone or provided text corrections for sections pertaining to the saturated zone. General concern was expressed for contamination of ground water and it was suggested that additional references are available that should be used to expand the discussions. A number of commenters addressed questions related to favorable condition 4 in the geohydrology guideline.

Response. Concerns about potential contamination problems in the Amargosa Desert and Ash Meadows are based on a misconception about ground-water flow. Waddell (1982) shows that ground water that flows under the Yucca Mountain site does not discharge at the springs in Ash Meadows. Travel times within the unsaturated zone are shown in Section 6.3.1.1.5 to be long enough to ensure that contamination of the saturated zone is very unlikely. A review of the bibliography provided in one of the comments is planned. Discussions under favorable condition 4, which applies only to saturated zone disposal, were deleted from the final EA text.

C.5.2 GEOCHEMISTRY

This category addresses 152 comments and questions about the accuracy and adequacy of the analyses conducted for the geochemistry guideline for the Yucca Mountain site. Because of the large number of comments received in this category, and the variety of subjects that the category covers, it has been divided into several issues, as follows: (1) Ground-water Chemistry, (2) Retardation and Sorption, (3) Mineralogy and Petrology, (4) Solubility, (5) Waste Package and Waste-package Environment, and (6) Miscellaneous.

Issue: Ground-water chemistry

Twenty-nine comments were received on this issue. Almost half of the questions concerned the U.S. Department of Energy (DOE) conclusion that water from Well J-13 in the saturated zone is expected to be chemically similar to ground water from the unsaturated zone (vadose zone) at Yucca Mountain where the repository would be located. Many of these reviewers argued that the DOE had no evidence to support this assertion. Some cited evidence that the chemistry of Well J-13 water has changed through time and varies stratigraphically within the well. Some of the commenters contended that the conclusions drawn from such non-conservative assumptions may not be valid.

A few commenters stated that characterization of water chemistry at Yucca Mountain is inconclusive and that the exploratory shaft may not encounter a reasonable spectrum of aqueous, geochemical, and host-rock conditions in the vadose zone. Statements were also made that construction of the exploratory shaft may be incompatible with planned characterization studies. Several other commenters argued that the effects that heat-generation from the repository will have on water movement and mineral stability are unknown, and that fracture flow has not been addressed. Another commenter stated that the possible precipitation of radionuclides in the vadose zone is only an hypothesis and is unsupported by research data. One commenter pointed out possible errors in age dating water samples using the carbon-14 method.

One commenter stated that a discussion of pH should be included in the Environmental Assessment (EA) under potentially adverse conditions, and another commenter inquired why pH data were not presented in Section 6.3.1.2.3 of the draft EA. Several commenters used a study by Henne (1982) to question if there was evidence for very rapid travel times through unsaturated tuffs at Rainier Mesa at the Nevada Test Site (NTS).

Response

The DOE position that Well J-13 water from the saturated zone is expected to be similar to the chemical composition of water from the unsaturated zone is supported by the literature. White et al. (1980) reported the composition of fracture and matrix waters in the unsaturated zone at Rainier Mesa on the NTS. The geologic setting of these waters is very similar to the Yucca Mountain site because both areas are composed chiefly of ash-flow tuffs and associated rocks. Ogard and Kerrisk (1984) showed that water from the saturated zone at Yucca Mountain, including water from Well J-13, fell within the range of fracture and matrix waters from Rainier Mesa. Analyses of cores by Oversby (1985) from the unsaturated zone of the Topopah Spring tuff at Fran Ridge indicated that none of the samples tested contained any evidence of significant amounts of readily soluble material that could increase the anion content of Well J-13 water. Therefore, the available literature does suggest that Well J-13 water is similar to water in the unsaturated zone at Yucca Mountain. When direct measurements of the chemistry of unsaturated-zone waters from Yucca Mountain become available (from site characterization studies), the DOE will evaluate the reference water composition.

The comments related to possible short residence times of water in the unsaturated zone are made on the basis of conclusions of Henne (1982) concerning the retention time of water in the unsaturated zone at Rainier Mesa. This has prompted the conclusion by some that "the ground-water chemistry in the unsaturated zone at Rainier Mesa is controlled by the soil chemistry, not by equilibration with the host rock." The short retention times of water in unsaturated-zone tuffs at Rainier Mesa, along with the implied high water velocities that were calculated by Henne (1982), do not appear to be justified by the data collected. The idea that soil chemistry alone controls water compositions in the unsaturated zone oversimplifies the behavior of water as it moves from the surface down through the tuffs. Both surface and subsurface geochemistries are important.

Hydrologic testing and sampling is planned in the exploratory shaft. Perched water, fracture-bound water, and any other mobile water in the vadose zone will be sampled and monitored. Samples of vadose water will be analyzed for dissolved oxygen, alkalinity, pH, carbon-14, hydrogen-3, chlorine-36, Na, Ca, Mg, K, HCO₃, SO₄, Cl, SiO₂, Mn, Fe, Al, CO₂, fluorocarbons, organic compounds, and for tracers used in drilling/construction water (lithium, bromine, and iodine). In addition, mineralogical and petrological samples from the shaft, and core samples collected in boreholes drilled from the shaft to probe for and characterize water occurrences, will also be analyzed. Samples will be obtained for whole-rock (matrix) mineralogy and fracture surface mineralogy using x-ray diffraction, electron microprobe, and standard petrographic methods. These studies will be supplemented by similar data collected from vertical boreholes drilled as part of the surface-based studies in the event that vadose zone water is encountered. It is believed therefore, that a reasonable spectrum of host-rock aqueous and geochemical conditions will be sampled.

The exploratory shaft will be constructed by conventional mining (not drilling) to prevent ground-water contamination and to provide continuous access to the shaft for study. If conflicts arise between planned tests and

the construction techniques, the techniques will be modified to the extent possible to accommodate planned testing.

The effects of repository heating on water movement have been considered in several studies and are currently being investigated at Sandia National Laboratories. It is true that the stability of minerals depends on temperature and water composition. The majority of the sorptive zeolites at Yucca Mountain, however, will not be subjected to a significant rise in temperature and will remain unaltered (see discussion under Section 6.3.1.2.3(3) of the EA). Temperature profiles will be reasonably well known from numerical simulations, although other factors bearing on mineral stability remain to be analyzed. The effects of fracture flow have been investigated by Travis et al. (1984), and this information forms the basis of the conclusions in Section 6.3.1.2.3(5) of the EA.

The comment concerning precipitation of radionuclides in the vadose zone as only an hypothesis refers to Siting Guideline 6.3.1.2.3(2) which asks if chemical conditions that promote precipitation are present at the site. Whether precipitation of waste elements will occur at a specific location and time cannot be answered until conditions at and near the repository have been defined. Rather than claim conditions that are uncertain at this time, only the pH of the water was claimed as a favorable condition for actinide precipitation. No other conditions that promote precipitation were claimed in the EA. The near-neutral pH of the water from Yucca Mountain is favorable because it is in the range where oxides and hydroxides of actinides and some other waste elements have minimal solubility. For solubility calculations used in the EA, the water was assumed to be oxidizing, which is reasonable for the unsaturated zone. This assumption results in higher solubilities than would exist under reducing conditions, and is thus a conservative assumption.

The commenter is correct in pointing out the possible errors in carbon-14 age dating. Waddell et al. (1984) discusses problems of the mixing of different age waters and intermittent recharge along the flowpath, both of which introduce additional uncertainty to the carbon-14 ages. Claassen (1983) also discusses age-date uncertainties.

A discussion of Eh and pH is included in the draft and final EA in Section 6.3.1.2.4(3). Data on water pH are included in the draft and final EA in Section 6.3.1.2.3(2). It did not seem appropriate to repeat this information in a summary section such as the "Conclusion" section at the end of Section 6.3.1.2.3 of the draft EA.

Issue: Retardation and sorption

Fifty-eight comments were received on this issue. Because of the large number of comments received and the variety of topics that these comments cover, this issue has been further divided into six topics addressing the areas of: general comments; zeolites; particulates, colloids, and complexes; fracture coatings; vapor transport; and fracture flow.

General comments. Many questions were asked on the general aspects of retardation and sorption at Yucca Mountain. The theme of all comments was that the DOE had little data to assess the sorption potential, retardation,

and radionuclide-transport rates and directions to the accessible environment. Moreover, some commenters stated that many of the assumptions used to determine retardation and sorption were unfounded.

Response. All of the data discussed in the draft and final EA apply to the region between the repository and the accessible environment, an area 5 kilometers (3 miles) from the periphery of the repository. Although it is true that retardation capacity along likely flowpaths at Yucca Mountain has not been measured directly, the existence of a major sorptive capacity at depth is shown by drillhole mineralogy. Furthermore, the upper bound on water flux within the host rock is 0.5 millimeter (0.02 inch) per year (Wilson, 1985); thus, very little water is available to dissolve the solid radionuclides.

The retardation factors listed on Table 6-23 (Representative sorption ratios and retardation factors for eight radionuclide elements with Yucca Mountain tuff) of the draft EA were calculated assuming saturated, porous-flow conditions. Calculations of retardation assuming both fracture and matrix flow in the unsaturated zone have been reported by Travis et al. (1984). Calculations presented in that paper indicate retardation factors considerably above the threshold mandated in 10 CFR Part 960 to claim the favorable condition. Travis et al. (1984) states that if flux conditions do allow fracture flow in the unsaturated region, diffusion out of cracks into the rock matrix will retard the progress of radionuclides by at least a factor of 100 (Section 6.3.1.2.3).

The assumption of equilibrium sorption for nonactinide radionuclides is justifiable up to fluid velocities of 8×10^4 meters (2.6×10^5 feet) per year (Rundberg, 1985). For actinide elements, lower velocities are indicated by preliminary studies, and these velocities are also well above the regulation for 1,000-year travel time to the accessible environment (10 CFR Part 960).

Preliminary sorption measurements were determined with the use of local waters from various formations along the likely flow paths from the repository toward the accessible environment and crushed tuff samples (including glassy samples). The effects on sorption from varying water composition and mineralogy are being investigated and will be described in more detail during site characterization. Although it is true that some aspects of retardation by sorption are still under study (such as the effects of ferromanganese oxyhydroxides and the effects that temperature will have on clinoptilolite stability), the abundance of sorptive zeolites in the saturated zone where water compositions are well characterized beyond the thermal envelope of the repository has been cited as a partial basis for the conclusions reached in the analysis of the geochemistry guideline.

One commenter requested that the range of sorption ratios be indicated on tables 6-21 (Average sorption ratios from batch sorption experiments on crushed tuff...) and 6-22 (Average sorption ratios from batch desorption experiments on crushed tuff...) of the draft EA in Section 6.3.1.2.3 of the EA. Because the standard deviation of the measured sorption values are provided in these tables, the overall range of values can be calculated for a given confidence level.

The effects of steadily increasing temperature on retardation by diffusional processes was questioned in several comments. Section 6.3.1.3.4 of the final EA has been modified to read, "As the temperature is increased, retardation because of diffusional processes will not be decreased."

Another commenter took issue with the statement in the draft EA that engineered barriers be considered for retardation because it is contrary to the intent of the guidelines (10 CFR 960.3-1-5). In the final EA, the discussion of the retardation capacity of the backfill and packing materials has been deleted from the conclusions in Section 6.3.1.2.3(1).

Commenters questioned the applicability of results from sorption studies in the laboratory using crushed samples to represent intact field rock because the reactive surface area of the crushed samples is much larger. Rundberg (1985), however, has shown excellent agreement between the sorption ratios obtained from crushed tuff and intact tuff for simple cations.

Many of the conditions evaluated for the geochemistry guideline were based on estimates of unmeasured properties and characteristics by using information that is currently available. As is the case for qualifying conditions, the statement is made in the draft and final EA that "... the evidence does not support a finding that the site is not likely to meet the qualifying condition ..."

Zeolites. Many questions were asked about the zeolites at the site, particularly in regard to their distribution and sorptive characteristics. Questions were also asked about whether a geochemical barrier actually exists in the Calico Hills unit beneath the repository.

Response. The capabilities of zeolites to adsorb radioactive particles are described in Section 6.3.1.2.3 of the EA. It is true that compositional variation in zeolites may be a factor in sorption behavior. For example, sorption of most radionuclides of interest by analcime-rich tuff does not compare favorably with clinoptilolite-rich tuff. This has been taken into account in sorption experiments by using zeolites from several horizons at Yucca Mountain.

Preliminary studies by Los Alamos National Laboratory on the effects of dehydration on the sorption characteristics of zeolites (see Section 6.3.1.2.3 of the final EA) indicate that the cation exchange capacity is not substantially altered after long-term heating.

Many zeolitized barriers, whether in the Calico Hills unit or other units, exist far outside the zone of the thermal effects of the repository. Three new figures have been added to Section 6.3.1.2 in the final EA that show the zeolite intervals in other cross sections.

Particulates, colloids, and complexes. Several questions were asked about the formation of particulates, colloids, and organic and inorganic complexes at the site, their transport, and their effect on solubility, sorption, and mobility of radionuclides at the Yucca Mountain site.

Response. The subject of the formation and transport of particulates, colloids, and organic and inorganic complexes will be addressed during site

characterization. With the information now available on porosity and diffusivity, radionuclides are expected to diffuse into the rock matrix; particulates and colloids will be filtered out of the water, and substantial sorption will occur. It is pointed out, however, in Section 6.3.1.2.3(2) of the EA, that no claims were made that the site had geochemical conditions that inhibit the formation of particulates, colloids, and organic and inorganic complexes. Furthermore, the wording in Section 6.3.1.2.3(2) of the EA has been changed from "Considering only mechanical infiltration, and assuming the above size distributions for colloid particles and tuff pore size distribution, it can be shown ..." to "... distribution, the potential exists ..." for bedded tuff underlying the host rock at Yucca Mountain to filter out some of the colloidal americium.

Fracture coatings. A few commenters asked what minerals might precipitate along fractures, and how fracture coatings would affect the migration of water and radionuclides into the rock matrix.

Response. The origin of fracture-coating minerals is not well understood. Although studies are being conducted, the results will not be included in the EA because they are not critical to the conclusions reached in the geochemistry guideline.

The fracture-coating minerals in the unsaturated zone, as stated in the EA, are the zeolites mordenite, heulandite, and clinoptilolite; smectite and illite clays; manganese oxides; minor calcite; and cristobalite. The identification of fracture-coating minerals in the saturated zone is still under study, although ferromanganese oxyhydroxides have been identified.

Experimental work is now being conducted to determine the sorptive capabilities of fracture-coating zeolites. It seems likely, however, that fracture coatings would limit the migration of water and radionuclides into the rock matrix. Until the exploratory shaft is completed, the DOE will have no direct information on fracture abundance at the site. Many drill holes at Yucca Mountain, however, contain many fractures without secondary minerals.

Vapor transport. A few commenters asked about the possibility of vapor-phase transport from the repository to the land surface by way of fractures in the rock overlying the repository.

Response. Because a repository at Yucca Mountain would be located in the unsaturated zone, the possibility of vapor transport of waste elements exists. Only the noble gases such as xenon, krypton, or radon; carbon as CO₂; tritium as H₂ gas or as water vapor; or iodine as I₂ vapor are possible waste elements that can be transported as gases or vapors. The aqueous phase in the unsaturated zone, however, can retard the movement of some of these waste elements because they are soluble in liquid water.

At this time, essentially very little work has been done on gaseous or vapor transport in the unsaturated zone at Yucca Mountain. This type of transport will be addressed during site characterization. A paragraph on gaseous transport has been added to the final EA in Section 6.3.1.2.3.

Fracture flow. A few commenters stated that if fracture flow exists at the site, diffusion of radionuclides into the rock might be significantly

different from those described in the EA because the velocity of fracture flow might be several meters per day.

Response. If fracture flow occurred, it probably would be more effective at moving radionuclides than is matrix flow. At the upper bound on flux of 0.5 millimeter (0.02 inch) per year for the host rock, however, matrix flow is likely to be the most important transport mechanism.

Issue: Mineralogy and petrology

Thirty-two comments or questions were received on this issue. Because of the large number of comments received and the variety of topics that these comments cover, this issue has been further divided into topics in the areas of: mineralogy and mineral stability, areal distribution of sorptive minerals, age of mineralization and alteration, and general comments.

Mineralogy and mineral stability. Several commenters stated that discussions in the EA on the mineralogy and mineral stability of the host rock were contradictory. Several questions were asked concerning the stability of the mineral assemblages at the site in regard to potential dehydration from waste heat.

Response. The draft EA contained several inconsistencies regarding the definition of the host rock, and understandably readers became confused. The definition of the host rock, a zone of nonzeolitized devitrified tuff in the Topopah Spring Member, has been clarified throughout the final EA wherever the definition appears.

As stated in the EA, most of the sorptive zeolites at Yucca Mountain are more than 300 meters (1,000 feet) below the repository. The maximum waste-induced temperatures that these zeolites will be subjected to is about 60°C (140°F) approximately 10,000 years after waste emplacement. This represents an increase above ambient rock temperature of about 23°C (73°F). This minor increase in temperature could affect the rate at which minerals such as clinoptilolite and mordenite recrystallize to less sorptive assemblages, although little reaction is expected over 100,000 years. The 50,000-year duration of the temperature rise caused by the repository is very short compared to the time required for the mineral transformation, estimated by Dibble and Tiller (1981) to be tens of millions of years. Geologic evidence suggests that the zeolites at Yucca Mountain formed before the Quaternary Period and have not been appreciably altered during Quaternary time.

Dehydration of smectites and zeolites is addressed in the EA in Section 6.3.1.3.4. On the basis of the information available, dehydration will not cause significant reductions in the retardation potential of smectites and zeolites.

The rates of diagenetic mineral formation and glass hydration provide useful information for mineral-stability studies, but they do not affect the conclusions in Section 6.3.1.1.4.

Areal distribution of sorptive minerals. Several commenters stated that the DOE has not identified the minerals that contribute most significantly to sorption, and that the distribution of sorptive minerals at Yucca Mountain is

poorly known. Several questions were asked about the distribution and type of minerals in fractures and their sorptive properties.

Response. The minerals that are primarily responsible for sorption of many cationic species have been identified, chiefly by x-ray diffraction studies of more than 600 core samples. The available sorption data are being analyzed to better determine which minerals are responsible for sorption. Because this research is not complete, the statement in Section 6.3.1.2.1 of the draft EA regarding the identification of sorptive minerals has been deleted in the final EA. Research on fracture mineralogy is needed and will be addressed further during site characterization. Work is currently under way to study the minerals in the fractures above and below the water table, and to determine under what conditions they formed so that it will be possible to predict which minerals might form in the future. Experimental studies are also being done to determine the sorptive characteristics of fracture-coating minerals.

At all points across Yucca Mountain, a minimum of 43 meters (140 feet) of zeolitic tuff apparently occurs between the repository horizon and the static water table. Therefore, all aqueous radionuclides must pass either straight downward or laterally and then downward through a minimum of 43 meters (140 feet) of zeolitic tuff before reaching the static water level and ultimately the accessible environment. The location of sorptive minerals are known from cored drillholes and further defined by cuttings from other holes at Yucca Mountain. Los Alamos National Laboratory is now correlating units between the drill holes. Figure 6-4 (North-south cross section through Yucca Mountain showing zeolite intervals) of the draft EA (Section 6.3.1.2.3) shows the location of clinoptilolite at the site. Three new figures have been added to the final EA that show the zeolite intervals in other cross sections.

Age of mineralization and alteration. Many questions were asked concerning the age of zeolitization and the length of time required to alter zeolites to nonsorbing materials.

Response. Timing of zeolitization is inferred from the data and reasoning of Bryant and Vaniman (1984), which relate the timing of zeolitization to major regional faulting in the area which has been estimated from a variety of geologic means to be in excess of 10 million years old.

The time required to convert clinoptilolite and mordenite assemblages to analcime at Yucca Mountain is not known. As described in the EA, the approach to addressing this uncertainty has been to assume the interval of zeolitized tuff containing both clinoptilolite (with possible associated mordenite) and analcime represents a section of rock in which the conversion reaction may be in progress. If the reaction proceeded to completion within the next 100,000 years, the amount of sorptive zeolites lost would be an insignificant part of the sorptive zeolites remaining in the overlying rocks. Available evidence, also cited in the EA, suggests that the time required for conversion is well in excess of 100,000 years. Thus, existing uncertainties about the time it takes for the conversion do not affect the position stated in the EA in Section 6.3.1.2.3.

Zeolitization could occur at any time in the vadose zone as long as sufficient water was available. The near absence of zeolites younger than 10 million years in the vadose zone suggests that there has been insufficient water to permit large-scale zeolitization in the vadose zone throughout all of Quaternary time.

General comments. One commenter requested a definition of "significant quantities" of zeolites and clays as used in Section 6.3.1.2.3(2) of the draft EA, and another commenter stated that despite the extensive geochemical studies conducted at the Yucca Mountain site by the DOE, key issues related to licensing criteria have not been resolved or adequately explored.

Response. The term "significant quantities" indicates greater than 5 percent for clays and greater than 10 percent for zeolites. Many of the bulk-rock samples analyzed contain 40 to 80 percent zeolites. Licensing issues are beyond the scope of the EA.

Issue: Solubility

Thirteen comments or questions were received on this issue. Several commenters acknowledged that the near-neutral pH of water from Yucca Mountain favors minimum solubilities (except cesium, carbon, iodine, and technetium), but wanted to know why elements with higher solubilities were not discussed and why waste silicates, carbonates, and other precipitates were not discussed.

One commenter challenged the assumption that the release of elements with high solubilities will be limited by the dissolution of bulk waste form. Another commenter noted that the implication that the release rate/inventory ratio meets the guidelines is questionable in light of the uncertainties and assumptions presented in Kerrisk (1984).

Some commenters noted that Daniels et al. (1982) discusses the importance of oxidation-reduction potential on solubility of key elements such as uranium and plutonium and that oxidation-reduction capacity of the solid phase (rock mineralogy) needs to be considered as well as the oxidation-reduction potential of the water.

One commenter stated that heat generated from the waste containers will raise the repository temperature and that moisture would be driven away from the heat source, possibly forming precipitates. Several commenters pointed out that the "drying-out scenario" could produce brines that may enhance the formation of uranium and plutonium complexes, thus affecting sorption effectiveness.

One commenter pointed out that the presence of a gas phase in the unsaturated zone would influence reaction temperature and kinetics, as well as potential radionuclide cation and anion transport. It was stated that the water chemistry in the vadose zone has not been characterized. Therefore, possible precipitation of radionuclides is clearly only an hypothesis in need of testing.

Response

The commenters are correct that the pH conditions at Yucca Mountain are favorable for the vast majority (98 percent) of waste elements present in spent fuel at 1,000 years after emplacement. The radionuclides of cesium, carbon, iodine, and technetium constitute only about 0.9 percent of the total activity of spent fuel 1,000 years after waste emplacement.

Silicate, carbonate, and phosphate anions can form solids with waste elements, but can also form aqueous complexes. It is not clear at this time whether the presence of these anions in water at Yucca Mountain would promote or impair precipitation. For this reason the effects of these species on precipitation was not discussed under the favorable condition that lists geochemical conditions that promote precipitation.

In order to investigate the assumption that the release of elements with high solubilities will be limited by the dissolution of the bulk waste form, the release rate/inventory ratio was recalculated. These calculations assumed the maximum fractional dissolution rates of 1×10^{-3} per year for cesium, strontium, iodine, and carbon for spent fuel, and for cesium and strontium for high-level waste. The maximum fractional dissolution rates for spent fuel are consistent with the values reported by Johnson (1982). Other elements were assumed to have maximum fractional dissolution rates of 1×10^{-4} per year. Although increases in the release rate/inventory ratio occurred, the results are still below the annual limit required to meet the favorable condition. The reason that the release rate/inventory ratio at 1,000 years is relatively insensitive to the changes in dissolution rates is that strontium-90 and cesium-137 have completely decayed by that time, and other radionuclides of cesium, strontium, iodine, and carbon do not make a large contribution to the total inventory.

Kerrisk (1984) presents two computer models that describe the dissolution rate of waste elements from a solid waste form. The results and conclusions of the two models are a strong function of the many assumptions made about solubilities and model parameters. As better and updated data become available, these assumptions will be reviewed.

A study of the oxidation-reduction capacity of the minerals at Yucca Mountain was recently completed (Caporuscio and Vaniman, 1985) but was unavailable for the draft EA. In the draft EA, solubilities were calculated using oxidizing conditions, which represents a worst-case condition because most waste elements have higher solubilities under oxidizing conditions rather than reducing conditions.

The effects of a "drying-out scenario" from heat generated by waste containers should be minimal. Actinide compounds in carbonate-rich waters have been investigated by Ogard and Kerrisk (1984). This study suggests that the effect of carbonate-rich water on actinide complexing will be minor. This in turn suggests that the effects of temperature and temperature-induced changes on actinide sorption are likely to be minor. These effects will be further addressed in the site characterization studies.

It has been anticipated that the gas phase in the unsaturated zone will be primarily air, although gas samples from the unsaturated zone have not

been collected and analyzed as yet. Experimental work on solubility, sorption, and radionuclide transport has been carried out in the presence of air (i.e., under oxidizing condition).

Vadose-zone water will be sampled and characterized during construction of the exploratory shaft. Present information indicates that water from the vadose zone is similar in composition to saturated-zone water at Yucca Mountain. The question of precipitation of radionuclides at a specific location and time cannot be answered until conditions at and near the proposed repository have been defined.

Issue: Waste package and waste-package environment

Ten comments were received on this issue. Most of the comments concerned the uncertainties surrounding the potential failure of the metal barriers, particularly in regard to the chemistry of the vadose zone water and oxidizing conditions in the environment of the repository. One commenter disagreed with the DOE conclusion that dissolution and precipitation processes in the host rock will have little effect on permeability because the tests may not represent in situ conditions around the repository. Finally, one commenter asked what assumptions were used in the model for waste dissolution.

Response

The estimates of waste-package lifetimes are preliminary and are based on available data. Laboratory experiments are being conducted for both expected and extreme conditions to derive bounds and values on expected waste-package lifetimes.

The DOE maintains that the mildly oxidizing environment expected at Yucca Mountain may prolong the life of a stainless steel waste disposal container; deleterious effects are not expected. Moreover, the elevated temperatures of most of the packages would not permit liquid water to exist near them for long periods of time. It is true, however, that the chemistry of vadose-zone water is not currently known, but there is good reason to believe that it is similar to water from the saturated zone produced from Well J-13 (see the Ground-water chemistry issue for a discussion of water from Well J-13 and the vadose zone).

It is true that the conclusion regarding possible permeability changes from dissolution and precipitation was based on short-term experiments. However, the significance of those experiments is that no large reduction in permeability was seen for Topopah Spring or Bullfrog tuffs, in contrast with the very large changes observed under similar conditions for other rock types.

In the draft EA in Section 6.3.1.2.3(4), the assumptions that formed the basis of the model for waste dissolution are described. Details behind these assumptions were too long for inclusion in the EA; they can be found in Kerrisk (1984). Experimental work (Wilson and Oversby, 1985) on release rates using spent fuel and glass have been added to Section 6.3.1.2.3(4).

Issue: Miscellaneous

Ten comments were assigned to the miscellaneous issue. The comments focused on conservatism in terms of the entire assessment, stating that the draft EA was not conservative. A few comments noted errors in expression such as referring to water from Well J-13 as Yucca Mountain water. One commenter wanted to know what the quantities of cesium, strontium, and radium would be in comparison to other radionuclides that might evolve. Another commenter pointed out typographical errors in the text of the draft EA.

Response

The DOE believes that the draft EA was conservative; the final EA has been made more conservative as a result of the introduction of public comments.

All errors in expression pointed out by reviewers, including inconsistencies and typographical errors in the text, have been corrected in the final EA.

The relative amounts of cesium and strontium vary with time. In the short-term (a few tens of years), cesium and strontium make up a significant fraction of the radionuclide inventory and become less important over the long-term. Cesium and strontium are virtually nonexistent after a few hundred years due to their 30-year half-lives. Comparatively, radium is an extremely minor contributor to the radionuclide inventory.

C.5.3 ROCK CHARACTERISTICS

The 43 comments received pertaining to the postclosure guideline on rock characteristics primarily are concerned with properties of the host rock. Five issues have been delineated: (1) Vertical and Lateral Extent, (2) Thermal and Mechanical Properties, (3) Mineralogy and Geochemistry, (4) Limitations and Effects of Uncertainties Regarding Rock Properties, and (5) Miscellaneous.

Issue: Vertical and lateral extent

Eight comments were received addressing this issue. Some commenters questioned whether Yucca Mountain has sufficient lateral and vertical extent to provide flexibility in the placement of a repository. Other commenters noted that insufficient data on rock properties are provided to either substantiate or refute the vertical and lateral extent of the host rock indicated in the Environmental Assessment (EA).

Response

Considering only the primary area, sufficient lateral extent to provide flexibility in placement of an underground facility at Yucca Mountain was not claimed. The U.S. Department of Energy (DOE) recognizes that the data presently available are inadequate on which to base a determination of usability

of areas outside the primary area. It is planned to obtain additional data during site characterization.

Issue: Thermal and mechanical properties

Twelve comments were received addressing this issue. All of the comments are concerned directly or indirectly with fractures, either natural or thermally induced and their potential effects on waste isolation. The topics addressed are: host rock effects, thermomechanical model, favorable condition 2, and thermal conductivity.

Host rock effects. A few commenters asked for a discussion of the effects of heat or hydration on glass in the host rock.

Response. Within resolvable limits, there is little or no glass in the Topopah Spring Member (potential repository horizon) at Yucca Mountain; it is considered to be devitrified.

Thermomechanical model. Several commenters indicated that the discussion of natural and thermally induced fractures was based on insufficient data or that the predictive model used was not valid.

Response. The effect of fractures on the potential for gas transport of radioactivity from the repository horizon to the surface will be evaluated from data obtained during site characterization. The Topopah Spring Member (potential repository horizon) in the Yucca Mountain area has been sampled from approximately 30 drill holes. Using measurements of bulk properties and mineralogy, it is reasonable to conclude that the variability in thermal properties of the potential repository horizon is understood. It is true that the thermomechanical model used by Johnstone et al. (1984) has limitations and the results reported are preliminary. However, the high strength of the Topopah Spring Member (Tillerson and Nimick, 1984) and the small size of the regions of overstress predicted by Johnstone et al. (1984) indicate that the conclusions of that study are adequate for the site selection process of the EA. This position is supported by experience and field tests in a similar devitrified welded tuff in a tunnel in Rainier Mesa nearby on the Nevada Test Site (NTS). Statements regarding the preliminary nature of the thermomechanical model have been added to the final EA text in sections where the model is discussed.

Favorable condition 2. Some commenters questioned why the DOE claimed favorable condition 2 when tuff obviously does not have sufficient ductility to seal fractures.

Response. Favorable condition 2 in the rock characteristics guideline requires (1) a high thermal conductivity, (2) a low coefficient of thermal expansion, or (3) sufficient ductility. The favorable condition is claimed on the basis of the fact that the tuff host rock does have a low coefficient of thermal expansion. The DOE believes the wording of favorable condition 2 clearly indicates that the presence of any one of the three characteristics is sufficient to claim the condition.

Thermal conductivity. A few commenters noted that tuff has a low thermal conductivity and coefficient of thermal expansion compared to salt, but

these properties are similar to those of other rock types being considered as potential host rocks at other sites.

Response. The comments regarding the coefficient of thermal expansion and thermal conductivity are correct, both values are low in comparison to salt. As stated above, a low coefficient of thermal expansion is a favorable aspect with regard to the rock characteristics guideline, whereas a low value of thermal conductivity is considered to be adverse. Changes in the text have been made to indicate these two properties of welded tuff are comparable to those of other common rock types, except for salt which has significantly higher values.

Issue: Mineralogy and geochemistry

Fourteen comments were classified within this issue. The comments concerned some aspect of the mineralogical and geochemical makeup of the Topopah Spring tuff (host rock). The issue addresses three topics: stability of zeolites, vapor transport and flow regime, and adequacy of data on geochemical conditions.

Stability of zeolites. The majority of commenters were concerned with the stability of zeolites and other hydrous minerals under a thermal load and their consequent ability to retard transport of radionuclides.

Response. Approximately 30 vertical drill holes have provided samples of the host rock at and near Yucca Mountain. Section 6.3.1.1.2 provides a summary of these drill holes. From these samples, it is known that about 98 percent of the host rock is composed of the minerals feldspar, cristobalite, and quartz. None of these minerals are hydrous and all are thermally stable at the temperatures expected under repository conditions. Some clays and zeolites, which are hydrous minerals, do occur in small fractures in the host rock, but the amounts are so small that they are judged not to adversely affect the overall rock properties. In strata underlying the host rock at depths of 300 meters (1,000 feet) or more, zeolites are abundant, but at this depth the thermal effects are unlikely to modify the ability of zeolites to be effective in retarding the movement of radionuclides. The EA was not explicit in describing the occurrence and distribution of zeolites and other hydrous minerals at Yucca Mountain. An attempt has been made to clarify this point in the final EA by modifying the text in Section 6.3.1.3.4 (potentially adverse condition 2) and adding three new cross sections of the zeolite intervals in Section 6.3.1.2.3.

Vapor transport and flow regime. Other commenters addressed the question of vapor transport of radionuclides and fracture flow versus matrix flow of ground water. One commenter asked if heat-stress fracture would enhance flow characteristics through the rocks in all directions. Additionally, it was asked if weapons testing at the NTS has contributed to the fracturing of the rock.

Response. Because a repository at Yucca Mountain would be located in the unsaturated zone, the possibility of vapor transport of waste elements exists. Only the noble gases such as xenon, krypton, or radon, carbon as CO₂, tritium as H₂ gas or as water vapor, or iodine as I₂ vapor are possible

waste elements that can be transported as gases or vapors. The aqueous phase in the unsaturated zone, however, can retard the movement of some of these waste elements because they are soluble in liquid water. Additionally, most of the gaseous radionuclides will have decayed considerably by the time the waste disposal containers begin to leak.

It is recognized in the discussion of the geohydrology guideline (6.3.1.1) that fracture flow of water may occur in both the saturated and unsaturated rocks at Yucca Mountain. The qualifying condition requires that the host rock can accommodate thermal, chemical, mechanical, and radiation stresses induced by repository activities. Admittedly, precise information on the proportion of fracture flow versus matrix flow is lacking, but during site characterization this question will be thoroughly investigated.

With regard to the comment on weapons-testing-induced fracturing, the Yucca Mountain site is sufficiently distant from present or potential underground test locations that collapse or formation of fractures is highly unlikely.

Adequacy of data on geochemical conditions. A few commenters addressed the adequacy of data on actual geochemical conditions at Yucca Mountain.

Response. Questions about the adequacy of data on the geochemical conditions at Yucca Mountain and whether water from Well J-13 is representative of waters beneath Yucca Mountain are discussed in Section 6.3.1.2 of the EA. During site characterization the DOE plans to obtain additional information on geochemical conditions at Yucca Mountain and to obtain and analyze waters from the unsaturated zone. Reference is also made to Section C.5.2, Geochemistry (Ground-water chemistry) for a more detailed discussion regarding Well J-13 water.

Issue: Limitations and effects of uncertainties regarding rock properties

Three comments were received addressing this issue. All of them indicated that limitations and uncertainties in the data on rock properties presented in the EA were so great that the evaluation of the suitability of Yucca Mountain in terms of the postclosure rock characteristics guideline is not convincing. Specifically questioned were the predicted thermal and pressure effects on the rocks, the models used to predict these effects, the extent of the lithophysal zones, and the effect of lithophysae on the thermo-mechanical properties of the host rock.

Response

For the postclosure rock characteristics guideline, the limitations and uncertainties of the data are discussed individually under each of the favorable and potentially adverse conditions. General statements regarding data uncertainties and assumptions are provided under Section 6.3.1.3.2.

Because the host rock is composed largely of minerals (feldspar, cristobalite, quartz) that would be stable under predicted repository conditions, it is concluded that significant mineralogic changes will not occur (see response to the preceding issue (stability of zeolites) and Section 6.3.1.1.2). As to mechanical effects, for the specific conditions under

consideration, temperature and pressure will tend to increase rock strength because: (1) heat will tend to dry the rock, and dry silicate rock at the temperature predicted is stronger than wet rock and (2) compressive strength of rock increases with confining pressure. The predictive models used by Johnstone et al. (1984) utilized state-of-the-art modeling techniques and the limitations of such techniques are recognized. Confidence in the model is based upon mining experience and field tests in similar devitrified, densely welded tuffs (G-Tunnel at Rainier Mesa). Validation of these models will be addressed during site characterization.

Information has been collected from about 30 vertical drill holes in the Yucca Mountain area. Useful lithophysae data from the cores provide confidence that the position and extent of the high lithophysal content zones in the host rock of the primary area (area 1) are known in a general way. A preliminary evaluation of the strength of the high-lithophysae Topopah Spring Member is presented in Price et al. (1985). However, the effect of various percentages of lithophysae on the thermomechanical properties will be investigated further during site characterization. The predictive model used by Johnstone et al. (1984) assumed 5 percent lithophysal cavities and Tillerson and Nimick (1984) have shown that the thermomechanical properties used by Johnstone et al. (1984) are representative of intact rock with a total porosity of 17 percent (12 percent matrix porosity plus 5 percent lithophysal porosity).

Issue: Miscellaneous

Six miscellaneous comments addressed the topics of: Rainier Mesa collapse; ground-water travel times, fault density, map inconsistencies, and technology for sealing openings.

Rainier Mesa collapse. A few comments were received regarding the collapse of the surface following a nuclear explosion beneath Rainier Mesa on the NTS. As this test was in tuff the commenters questioned the stability of tuff.

Response. The type of collapse that occurred at Rainier Mesa following an underground nuclear explosion is not possible at Yucca Mountain. Underground nuclear explosions have not occurred at Yucca Mountain nor are they planned in the future. At Rainier Mesa, highly fractured areas extended from the testing horizons to the top of the mesa. A subsidence crater formed above the explosion, which resulted from a collapse of rock into the underground cavity created by the nuclear explosion. In the case of Yucca Mountain, the nearest nuclear testing area is 40 to 50 kilometers (25 to 31 miles) away. No large cavities, either from nuclear explosions or underground mining, will be or have ever been created at Yucca Mountain.

The stability of the welded tuff is supported by the tunneling experience in G-Tunnel at Rainier Mesa. This tunnel is partially located in welded tuff of the Grouse Canyon Member of the Belted Range Tuff. No special ground support was required even though a near-vertical fault zone with a 1-meter (3-foot) vertical displacement was encountered (Tibbs, 1985). Information on G-Tunnel support requirements has been added to the final EA in sections 6.3.3.2.3 and 6.3.3.2.4.

Ground-water travel times. One commenter suggested a word change from "decrease" to "increase" in the statement on the travel time at which water moving in fractures is changed because the thermal pulse will tend to close the fractures.

Response. The commenter is correct in suggesting that ground-water travel time in fractures could increase if the thermal pulse caused fracture apertures to decrease. The phrase has been amended in the final EA.

Fault density. One commenter pointed out that fault density in the surface rocks is poorly known and probably greater than mapped because rock exposures are poor, and that fault density in the subsurface is unknown.

Response. The comment regarding fault density has merit. The density of faulting and fracturing at the surface is only known for those areas where rock exposures are good. Rock exposures are poor on much of Yucca Mountain. However, standard geologic mapping techniques and application of geologic models enable extrapolation from well-exposed areas into poorly exposed areas, including the subsurface. The actual fault density in the subsurface can only be determined by underground excavation during site characterization.

Map inconsistencies. One commenter noted that various maps showing the repository area differ in showing the shape and size of the area and are at different scales.

Response. Standard maps and figures with the same scale are not appropriate throughout the text. In many cases, the purpose of a figure is different, and it is useful to highlight or focus on different aspects of a particular subject. A standard size and shape of the repository area is not possible because the exact size and shape has not been determined and because the figures are from different studies covering different areas. A consistent scale is not used because the different figures are intended to emphasize varying aspects of the repository area. For this reason, use of one standard design area and scale would not be reasonable.

Technology for sealing openings. One commenter stated the technology for sealing shafts and boreholes is not described adequately in the EA.

Response. None of the shaft and borehole sealing measures planned for Yucca Mountain require development of new technology. These measures include emplacement of a surface barrier in the upper portion of all shafts, crushed rock in the shaft interior, settlement plugs within all shafts, and plugs within all boreholes. A detailed description of the sealing program will be presented in the Site Characterization Plan if Yucca Mountain is selected for site characterization.

C.5.4 CLIMATIC CHANGES

The climatic-changes technical guideline is concerned with the potential for future climatic changes to favorably or unfavorably affect the ability of a repository to isolate waste over the 10,000-year period required by the

Environmental Protection Agency regulations (40 CFR 191.3). The 43 comments received in this category have been subdivided into four issues: (1) Evidence for Past Water-Table Elevations and Paleoclimates, (2) Effects on Hydrologic Conditions, (3) Effects on Waste Isolation, and (4) Miscellaneous.

Issue: Evidence for past water-table elevations and paleoclimates

The fifteen comments received on this issue were subdivided into three topics: past water-table positions, computer modeling, and paleoclimatic studies.

Past water-table positions. Four commenters questioned the field evidence for past water-table elevations noting that the presence of hydrated minerals may not uniquely reflect past water-table positions, and noting that calcite veins in Ash Meadows provide strong evidence of spring discharge for at least 1.7 million years.

Response. The distribution of zeolites and smectite clays provides one source of information on past water-table positions that should be balanced against other indications of water-table elevation. It is recognized that uncertainties due to the potential for perched water tables, potential for uplift or subsidence, and possible chemical differences during formation of minerals should be considered, as expressed by Jones (1982). These uncertainties are reflected in the text of Section 6.3.1.4.3 of the final Environmental Assessment (EA).

The draft EA incorrectly attributed a uranium-thorium date for calcite veins in Ash Meadows to Winograd and Doty (1980); the correct citation should be Winograd et al. (1985); and the dating technique was uranium-uranium. Section 6.3.1.4.3 has also been revised to clearly indicate that Winograd and Doty (1980) used a theoretical approach to estimate a maximum water-table level of 30 meters (100 feet) higher in the central portion of the Ash Meadows ground-water basin, whereas an upper limit of 50 meters (164 feet) higher than the present water table is suggested by calcite vein deposits in Ash Meadows that were deposited during early to mid-Pleistocene. These two results are not considered to be inconsistent with each other.

Computer modeling. A number of commenters questioned aspects of the computer-modeling studies that were used to predict a 130-meter (426-foot) water-table rise on the basis of a 100 percent increase in precipitation. It was noted that mixing computer predictions and field evidence was confusing, and that uncertainty in the results of modeling was so great that it appears possible that the repository host rock could become saturated. The validity of precipitation-recharge relationships used in the model was questioned, as well as the applicability of the model to fracture-flow conditions.

Response. The text in Section 6.3.1.4.4 has been expanded to compare the various lines of evidence for higher water-table positions, namely computer modeling and the vitric-pumice data.

The U.S. Department of Energy (DOE) agrees with the need to recognize uncertainty in the modeling of water-table positions. The precipitation-recharge relationship is an empirical approach, and limitations are specifically stated in Czarnecki (1985). The approach used in this modeling

is considered appropriate for fracture-flow conditions (Czarnecki and Waddell, 1984), although no provision was made for permeability changes when the water-table levels reached previously unsaturated units. The application of a multiplier of 15 to recharge as a result of a 100-percent increase in precipitation may be overly conservative, because evidence from a field site suggests that two-thirds of potential recharge predicted by the Eakin method may become runoff (Czarnecki, 1985). The model also assumes an instantaneous response time, in that water-table rise is not time-dependent. It should be noted that the 55-meter (180-foot) buffer between the repository and the water table position predicted under a 100-percent increase in precipitation is a minimum distance. It is shown in Section 6.3.1.1 that over most of the primary repository area, the buffer distance is at least 250 meters (820 feet) and reaches as much as 400 meters (1,312 feet). Therefore, the 55-meter (180-foot) buffer is a very conservative value, and saturation of the repository due to climatic changes in the next 10,000 years is not considered likely. Field evidence in the form of unaltered vitric pumice, which is found about 100 meters (328 feet) below the repository horizon, also supports the conclusion that the repository level has never been saturated for any substantial length of time. Potentially adverse condition 1 will remain not present at Yucca Mountain.

Paleoclimatic studies. Some commenters questioned the validity of paleoclimatic data in the EA, pointing out inconsistencies in the studies due to a lack of information on ecologic constraints for both modern and past plant distributions. Further evidence was requested to support the statement that semiarid conditions persisted in southern Nevada during pluvial periods.

Response. Information on paleoclimates in the southern Great Basin has been presented in Section 6.3.1.4.3 of the final EA. The inconsistencies present in the draft EA have been corrected. The potential inconsistency related to glacial versus pluvial conditions arises because the two periods may not coincide in time. Using standard climate classifications, a 100 percent increase in precipitation during a pluvial, as predicted by Spaulding et al. (1984), would place the precipitation at about 300 millimeters (11.8 inches), well within the 250- to 600-millimeter (9.8- to 23.6-inch) range for semiarid conditions. Most authors agree that even during pluvials, semiarid conditions persisted in Southern Nevada. Additional references have been provided to justify this statement in the EA.

Issue: Effects on hydrologic conditions

Ten comments were received concerning the effects of hydrologic conditions. These comments have been subdivided into two topics: changes in recharge and EA clarifications.

Changes in recharge. A few commenters addressed the problems of estimating recharge to the water table on the basis of precipitation, pointing out the complications inherent in using regional methods for site-specific applications. The validity of the flux and recharge estimates used in the EA was questioned in several comments.

Response. Various approaches were used to estimate recharge in the EA. The discussion of the approaches in Section 6.3.1.4.2 were expanded to include Czarnecki (1985) and Czarnecki and Waddell (1984). Limitations of

regional methods are explicitly discussed in the EA in Section 6.3.1.1.5, and the text notes that the DOE places confidence in the regional relationships between precipitation, flux, and recharge and in their application to Yucca Mountain. These relationships have provided acceptable results in other areas. It should be recognized that modern recharge estimates derived from regional methods by Czarnecki (1985) are compatible with site-specific flux estimates by Montazer and Wilson (1984). The flux estimates by Montazer and Wilson (1984) are for current conditions; future pluvial conditions would undoubtedly increase flux and recharge. Site hydrologic conditions will be more firmly established after in situ testing in the exploratory shaft.

EA clarifications. Commenters were concerned with inconsistencies in the EA text with regard to the hydrologic effects of climatic changes.

Response. Section 5.2.2 has been revised to acknowledge the potential for climatic changes to modify hydrologic conditions. Inconsistencies in Section 6.4.2 with regard to estimates of increased precipitation during pluvial conditions have been corrected to reflect the most recent estimate by Spaulding et al. (1984) of 100 percent above modern precipitation. The modeling studies on water-table positions during pluvial periods were based on a 100 percent increase in precipitation (Czarnecki, 1985). Text in Section 6.3.1.4.3 discusses possible changes in hydrologic conditions during pluvials.

Issue: Effects on waste isolation

Nine comments were received on the issue of the effects of climatic changes on the ability of the Yucca Mountain site to isolate waste. The comments address two general topics: increases in radionuclide transport, and repository performance.

Increases in radionuclide transport. Commenters questioned the DOE finding on potentially adverse conditions that perturbations in hydrologic conditions over the next 10,000 years are not likely to be sufficient to significantly increase radionuclide transport to the accessible environment. Reliance on geochemical retardation under pluvial conditions was noted to be unsupported, and an inconsistency with a finding of not present on favorable condition 2 in Section 6.3.1.1 (Geohydrology) was also noted.

Response. The DOE position in the draft EA of not present for the second potentially adverse condition in climatic change was claimed because, even though the return to maximum pluvial conditions within the next 10,000 years is considered possible, this would not significantly increase the transport of radionuclides. Under this situation, the scenarios that must be enacted to allow sufficient volumes of water to contact the radioactive waste and dissolve sufficient material to exceed the Environmental Protection Agency release limits are unlikely as can be shown by comparison with Sinnock et al. (1984). EA Section 6.4.2 provides a thorough discussion of potential releases for the upper bound on expected flux of 0.5 millimeter (0.02 inch) per year. Assuming very low direct sorption under fracture-flow conditions, matrix diffusion is expected to remain effective in reducing releases per unit time by a factor of up to 400 (Travis et al., 1984). Calculations by Sinnock et al. (1984) did not include retardation in the fractures, as suggested by several commenters. Increased fluxes sufficient to cause

saturation of the host rock would also decrease radionuclide solubilities because less oxidizing conditions would be developed (Sinnock et al., 1984; and Section 6.3.1.2.4, potentially adverse condition 3).

It should be noted that favorable condition 2 in geohydrology differs markedly from both the geohydrology and climatic changes potentially adverse conditions. The favorable condition, which was not claimed, requires that expected changes would not affect or would favorably affect the isolation capability of the repository over 100,000 years. The geohydrology favorable condition is clearly a more severe condition to meet, because it requires that no effect or a favorable effect on isolation result from any possible climatic cycle or trend. The geohydrology potentially adverse condition 1, considered not present, requires that expected changes in geohydrologic conditions be sufficient to significantly increase radionuclide transport compared to pre-waste-emplacment conditions. This condition does not specify a time frame or how significant a change is needed, although it is assumed that 100,000 years should be the period of concern. Findings of not present on both of these potentially adverse conditions have been made in the final EA, and text revisions have been made to strengthen the support for these findings.

Repository performance. A few commenters addressed general questions of repository performance under expected climatic changes, questioning the reliability of extrapolation of climatic information over 10,000 years and the validity of current data on the effects of climatic change.

Response. The DOE has used available evidence to reach preliminary findings for all guidelines as specified in Appendix III of 10 CFR Part 960. Several approaches are used in the EA to establish the likelihood that future climatic changes could lead to diminished isolation performance, including review of evidence from field studies for past positions of the water table; computer-modeling studies to determine the possible effects of maximum pluvial conditions on the water-table position; and review of performance-analysis calculations of a variety of scenarios reflecting climatic extremes and conservative, but realistic, assumptions. During site characterization, further studies will reduce uncertainty in the boundaries of the basins within the Death Valley ground-water system, allowing better predictions of the effects of expected climatic changes on the interaction of the ground-water basins and the concomitant changes in other hydrologic conditions. In situ studies will also improve the ability to predict the effects of climatic changes on conditions in the unsaturated zone. It should be noted that isolation requirements apply to the 10,000 years following closure, although some technical guidelines require an assessment of the long-term predictability of site conditions over 100,000 years.

Issue: Miscellaneous

Nine comments addressed errors in the EA text, or suggested clarifications to improve discussions of climatic trends in the EA. Two topics were identified from the comments: general text corrections and climatic trends.

General text corrections. An error in conversion of temperatures from degrees centigrade to degrees Fahrenheit was noted. In addition, one

commenter felt that the wording relative to a statement on paleoclimatic evidence needed clarification.

Response. The corrected conversion from centigrade to Fahrenheit was added to the final EA. The wording regarding a statement on paleoclimatic evidence for lake positions was clarified by insertion of the term "shorelines" indicating this is the form of evidence that is being used in the final EA.

Climatic trends. A few commenters addressed various aspects of the climatic trends that are recognized in the western United States. One commenter questioned the role that atmospheric increases of carbon dioxide might play in climatic changes in southern Nevada.

Response. The statement in the draft EA on the role of the Sierra Nevada Mountains in the increasing aridity of the Southwest during the Quaternary has been attributed in the final EA to Winograd et al. (1985), rather than Winograd and Doty (1980). A review of literature on paleoclimates has been added to the final EA to provide alternative interpretations where appropriate. Several commenters pointed out that long-term trends toward increasing aridity are not contradicted by cyclic fluctuations from wetter to more arid conditions that are superimposed on the trend. One commenter implied that downgradient migration of discharge points in the Ash Meadows basin during Pleistocene was attributed by Winograd and Doty (1980) to trends of increasing aridity; such is not the case. Section 6.3.1.4.3 clearly describes these changes as related to changes in the configuration of ground-water basins within the Death Valley ground-water system.

C.5.5 EROSION

This category of comments is concerned with rates of erosion at Yucca Mountain and depth of the proposed repository. Ten comments were received in this category. Three commenters noted that the data to support the erosion rates cited in the draft Environmental Assessment (EA) are few and that additional data and alternative interpretations are available in the scientific literature. Two commenters noted that potential tectonic activity is not adequately considered in the discussion of erosion rates. Three commenters stated that the 200-meter depth in the disqualifying condition is an arbitrary number without a sound basis. One commenter noted that the erosion guideline did not address the possibility of fractures providing access from the repository to the surface. Another commenter questioned that data obtained during excavation of the exploratory shaft would provide information on erosion rates at Yucca Mountain.

Response

The U.S. Department of Energy (DOE) agrees that additional data are needed to develop a complete understanding of erosion rates at Yucca Mountain. Comprehensive studies are being planned for site characterization to provide a more complete data base and to evaluate alternative hypotheses regarding the effects of future climates and tectonic activity on erosion rates.

Regarding the 200-meter (656-foot) depth criterion, it is noted that the Nuclear Regulatory Commission concurred with this depth figure. It is further noted that this depth is sufficiently great that any conceivable erosion rate will not uncover or otherwise adversely affect a repository within the next 10,000 years.

The comment regarding fractures providing access from the repository to the surface presumably is a concern related to movement of radioactive gases to the surface. The disqualifying condition for erosion is an explicit constraint on positioning the repository and only requires that the facility be located more than 200 meters (656 feet) below the ground surface. The gas transport question will be thoroughly investigated during site characterization. Until access to the proposed repository depth is provided, it is not possible to evaluate the gas transport question.

The DOE agrees that no information bearing on erosion rates will be obtained from the exploratory shaft and has revised Section 6.3.1.5.7 of the EA accordingly.

C.5.6 DISSOLUTION

The characteristics of rock dissolution within the repository horizon are necessary to determine if radionuclide releases are likely to be greater than are allowed by the regulations. None comments relating to dissolution were received. These comments are categorized into three issues: (1) Repository Conditions, (2) Evidence for Dissolution of Tuffs, and (3) General Criticism.

Issue: Repository conditions

This issue relates to expected repository conditions following closure. One comment received expressed concern that the near-field emplaced repository will not offer standard temperature and pressure conditions. The commenter questioned the validity of the experimental results presented in the draft Environmental Assessment (EA). Two additional commenters asked about the expected temperatures near the waste disposal containers.

Response

Those parties involved with experiments and testing are aware that the repository conditions will not be at standard temperature and pressure. Temperature limits on spent fuel waste disposal containers are 350°C (662°F). The maximum temperature reached in the rock material is related to the spacing of waste disposal containers. The pressure will remain at approximately one atmosphere, but the temperature will rise. Experiments and tests are being conducted at elevated temperatures up to 250°C (482°F) and the equilibrium pressure of water vapor over solutions at those temperatures where experiments are run at over 100°C (212°F). A combination of laboratory experiments and geochemical thermodynamic and kinetic models are being used to predict long-term repository conditions.

Issue: Evidence for dissolution of tuffs

Three comments were received in this area. Two of the commenters questioned the statement that tuffs in the repository setting will have a low dissolution potential, giving the following reasons: little is known about the relevant reaction rates, determination of silicate thermodynamics is a complex problem, and reactions which occurred during the Quaternary were subject to different conditions than those expected within the repository. One commenter agreed that there is no evidence, based on a review of the literature, to presume that significant dissolution will occur that would lead to radionuclide releases greater than are allowable. All of the comments stated that there is a significant relationship between tuff mineralogy, aqueous chemistry, and radionuclide transport.

Response

The question of possible evidence for dissolution of the host rock has been examined in the unsaturated zone in the vicinity of the exploration block and Well J-13 where the Topopah Spring Member is below the water table. The lack of indication of solution, even within the saturated zone, is compelling evidence that the volcanic rocks at Yucca Mountain are not subject to dissolution to any significant extent. Since these conclusions are based on field observations, additional data resulting from laboratory-based studies on rates of dissolution or the complexity of silicate minerals would not serve to change them. Dissolution processes during the Quaternary and future dissolution rates are discussed in Section 6.3.1.6.5 of the EA.

The relationship between tuff mineralogy, aqueous chemistry, and radionuclide transport has been investigated and will continue to be investigated during site characterization. Current information indicates that aqueous chemistry and tuff mineralogy are at or near equilibrium conditions (Ogard and Kerrisk, 1984).

Issue: General criticism

Three comments were received that criticized certain points in the discussion of the dissolution potential of tuffs. One commenter stated that experiments similar to those performed on the Bullfrog Member should also be conducted on the Topopah Spring Member. The second commenter stated that six authoritative references were ignored with respect to the influence of potential changes and water chemistry on dissolution. The third commenter suggested that Section 6.3.1.6.7 contradicts the first paragraph of Section 6.3.1.6.6.

Response

The reference cited in Section 6.3.1.2.2 of the draft EA (Knauss et al., 1984) describes the experiments that have been performed on the Topopah Spring Member. Since the writing of the draft EA, several other publications which discuss these experimental results have been published.

The six references noted in the second comment were considered in arriving at the conclusions that were presented in the section on dissolution. As an example, Kerrisk (1983) referenced four of the six in a discussion of reaction-path calculations of volcanic-glass dissolution.

The experiments that are planned for site characterization (Section 6.3.1.6.7) are to confirm what is stated in Section 6.3.1.6.6.

C.5.7 TECTONICS

Addressed in this category are 123 comments concerning the assessment of postclosure tectonics at Yucca Mountain as presented in the draft EA (Section 6.3.1.7). The primary function of this technical guideline is to ensure that the likelihood of disruption of waste isolation due to tectonic processes is at or below acceptable levels based on all available information. The first two issues cover the potential for volcanic and seismic activity in the vicinity of the site. The potential for a release of radionuclides due to tectonic processes is the focus of the favorable condition (Section 6.3.1.7.3), the qualifying condition (Section 6.3.1.7.1), and the disqualifying condition (Section 6.3.1.7.5) in the Environmental Assessment (EA). The U.S. Department of Energy (DOE) conclusions on all three conditions have been challenged. The comments are categorized into three issues: (1) Potential for Volcanic Activity, (2) Potential for Seismic Activity, and (3) Potential for Tectonically Induced Loss of Containment.

Issue: Potential for volcanic activity

Fifteen comments were received on this issue. Included are remarks on the data used to assess the potential for volcanism at the site and the analyses of those data. Questions directly addressing the possibility of disruption of an underground repository by volcanic activity are addressed separately in the final issue. Specific topics covered below are: silicic volcanism, hydrothermal and hydrovolcanic activity; and eruption of volcanic materials.

Silicic volcanism. Several commenters noted that the effort in the EA concentrated on examining the potential for basaltic volcanism, while silicic volcanism was de-emphasized.

Response. The U.S. Geological Survey (USGS, 1984) reviewed available data on silicic volcanism and concluded that no silicic volcanism has occurred within 100 kilometers (62 miles) of the site during the last 6 million years. First silicic and then basaltic volcanism have become increasingly concentrated toward the margins of the Great Basin during the last 14 million years (Christiansen and McKee, 1978). Based on these observations, the likelihood of silicic volcanic activity over the next 10,000 years is probably negligible.

Hydrothermal and hydrovolcanic activity. A number of commenters noted that the potential for hydrothermal and hydrovolcanic activity was not discussed in the EA.

Response. Significant hydrothermal activity is usually associated with long-lived centers of andesitic to silicic volcanism. As discussed above, evidence for recent silicic volcanism is absent in the vicinity of the site. Areas of small-volume basaltic volcanism with youngest ages close to 300,000 years old are probably characterized by a low thermal flux incapable of supporting hydrothermal activity. Hydrovolcanic eruptions (i.e., explosive volcanic activity associated with magma-water interaction) probably occur in less than 2 percent of all western U.S. eruptions (Smith and Luedke, 1984). The significance of both types of secondary volcanic processes will be further evaluated during site characterization.

Eruption of volcanic materials. Estimates for the probability of volcanic eruption at a site at Yucca Mountain were questioned by the largest number of reviewers commenting on the issue. It was suggested that silicic, hydrothermal, and hydrovolcanic activity should be included in probability calculations. Derivation of the mean probability (approximately 1 chance in 10,000 over 10,000 years) was not clearly explained in the EA. Some commenters noted that age dating of volcanic features was incomplete. One reviewer felt that high heat flow due to subduction processes beneath Yucca Mountain would make construction of a repository there imprudent. Finally, one reviewer asserted that the potential for large-scale impoundment of surface waters induced by volcanic activity (potentially adverse condition in Section 6.3.1.7.4) may be present at the site, in disagreement with the findings of the EA.

Response. As discussed in the previous two topic responses, silicic, hydrothermal, and hydrovolcanic activity are presently thought to be unimportant contributors to recent volcano-tectonics in the vicinity of Yucca Mountain. Should studies conducted during site characterization alter this perception, these processes will be considered in a thorough assessment of the potential for future volcanic activity. Further work is required to better resolve a mean probability for the eruption of volcanics at the site. Section 6.3.1.7.5 in the EA, as well as favorable condition 1, have been revised to include further discussion of volcanic event probabilities. The Site Characterization Plan will outline the requirements for the study. Sampling and age dating of volcanic centers will continue under site characterization. Subduction-controlled volcanism and attendant heat flow probably ceased to be important in the Great Basin more than 10 million years ago.

In response to the challenge to the findings on potentially adverse condition 5 in Section 6.3.1.7.4, the low average rainfall and high evaporation rates make large impoundments of surface waters resulting from any natural phenomenon highly unlikely. This potentially adverse condition is judged to be not present at Yucca Mountain.

Issue: Potential for seismic activity

Seventy-two comments were received concerning the potential for seismic activity in the vicinity of the site. Most of the commenters focused on the incompleteness of the present information on historic and prehistoric faulting and questioned the adequacy of probability, recurrence, and ground-motion computations based on current understanding of tectonics near the site.

Comments concerning the potential effects of fault movement on the containment of waste at the repository are addressed in the following issue. Presented here are responses to comments on the following topics: regional seismicity, fault delineation and dating, earthquake probabilities, and faulting effects on ground-water flow.

Regional seismicity. Reviewers expressed concern over several aspects of the regional seismicity around the Yucca Mountain site. Major comments centered around the proximity and association of the site to zones of seismic activity in the western United States such as Mammoth Lake, the San Andreas Fault, the Nevada Seismic Zone, the Intermountain Seismic Zone, and the East-West Seismic Belt. Corrections to distances to these features and to earthquakes within them as given in the EA were requested. The quiescence of the Las Vegas Valley Shear Zone was questioned as was the possibility of explosion-induced aftershocks due to testing at the Nevada Test Site (NTS). Citing the short record of historical seismicity at the site, one reviewer challenged the conclusion that potentially adverse condition 4 (Section 6.3.1.7.4 of the EA) of local seismicity exceeding that of the tectonic setting is not present at the site. This commenter and others suggested that more earthquake data are necessary to adequately assess local seismicity patterns.

Response. Location of the site relative to the San Andreas Fault in western California, the Nevada Seismic Zone, and the Intermountain Seismic Zone is not thought to represent a major seismic hazard. In addition, inclusion of seismicity data from these three regions and Mammoth Lakes in assessments of seismic risk at Yucca Mountain may be appropriate for certain purposes, but would not be appropriate for site-specific hazard studies. The mechanism generating earthquakes along the San Andreas Fault is different from that operating at the site, which is far from the boundary. Also, the results of Christiansen and McKee (1978) suggest that the higher rates of seismicity within the Nevada and Intermountain seismic zones and at Mammoth Lakes are consistent with a migration of volcanism and faulting away from the center of the Great Basin and the site, and toward the eastern and western edges of the Great Basin. Seismicity of Mammoth Lakes is almost certainly associated with the migration of magma at depth. There is no evidence that magma bodies exist beneath or near Yucca Mountain. The outline of the East-West Seismic Belt is, of course, subjective and has been removed from Figure 3-9 (Historical seismicity in the western United States) of the final EA. The site is located on the southern fringe of this belt, in a region of relative seismic quiescence. The Las Vegas Valley Shear Zone has also been seismically quiet, as have been most northwest-trending-faults in the Great Basin (USGS, 1984).

Several distance measurements have been changed in the final EA as a result of comments by reviewers. The distance from the site to the Owens Valley earthquake is given as 130 kilometers (81 miles) (Section 6.3.1.7.4). Its magnitude is reported as 8+. The distance to the Intermountain Seismic Zone is stated as "... more than 250 kilometers (155 miles) east of the site ..." (Section 6.3.1.7.4).

The closest underground nuclear explosions have been located 40 to 50 kilometers (25 to 30 miles) from the site. Explosion-induced aftershocks have been documented and analyzed (ERDA, 1977). The vast preponderance of

aftershocks occur at shallow depths (probably less than 5 kilometers (3 miles), and are located within 14 kilometers (9 miles) of ground zero of the preceding explosion (ERDA, 1977).

Though local microearthquake data for the site are limited to a few years, the U.S. Geological Survey (USGS, 1984) reported that the seismic record for the region is complete for all earthquakes greater than or equal to a magnitude of 4 to 5 occurring in the past 40 years. All events between magnitude 7 and 8 that have occurred in the region over the past 130 years are likely to have been documented. New information on focal mechanisms of earthquakes in the vicinity of Yucca Mountain has been presented by the USGS (1984) and has been incorporated into the final EA. Neither the seismic record nor the regional tectonics indicates that future seismicity at the site is likely to be more frequent or of higher magnitude than that occurring throughout the southern Basin and Range Province. Therefore, potentially adverse condition 4 (Section 6.3.1.7.4 of the EA) is considered to be not present at the site. The site characterization program will enhance understanding of seismicity patterns at Yucca Mountain and in the surrounding region and will permit a more confident extrapolation of the data into the future.

Fault delineation and dating. The largest number of comments on this issue addressed the adequacy of information on the delineation and age of faults near the site. It was pointed out that all faults on Yucca Mountain require further study and various techniques for accomplishing this goal (e.g., low-sun-angle photography, trenching, establishing better stratigraphic relationships) were suggested. Citing the work of Swadley et al. (1984) and Szabo and Kyser (1985), several reviewers contested the conclusion that there is no unequivocal evidence for surface faulting within the 1,100-square-kilometer (425-square-mile) area of the site during the last 40,000 years. Commenters interpreted the work of Carr (1984) to indicate that uplift rates on the Windy Wash Fault near the site are equal to those in tectonically active areas of Death Valley. The stratigraphy-determined age of nearby block-forming faults was questioned. Also, reviewers noted that the EA did not adequately consider strike-slip faulting.

Response. Studies and maps of the types suggested will be evaluated for inclusion in the site characterization program to better understand the location, age, and seismic potential of faults at Yucca Mountain. Conclusions presented in the EA appropriately incorporated all available published information on faulting in the vicinity of the site. The Swadley et al. (1984) reference was being produced concurrently with the draft EA. At the time of publication of Swadley et al. (1984), there was no unequivocal evidence of surface fault displacement younger than 40,000 years within a 1,100-square-kilometer (425-square-mile) area around the Yucca Mountain site. New data (6 age-dates) on the thermoluminescent age of a disturbed eolian silt in eastern Crater Flat may indicate surface displacement on the order of 1 to 10 centimeters (0.39 to 3.9 inches) during the Holocene (Dudley, 1985). Dudley also states, however, that this dating technique is highly provisional and that these dates are preliminary and have not been verified.

The work of Szabo and Kyser (1985) reports ages from 26,000 to over 400,000 years for secondary carbonate deposits in fault-related fractures from drill cores at Yucca Mountain. However, these preliminary results were

based on few samples and, as Szabo and Kyser (1985) state, may or may not be indicative of the timing of faulting episodes. These ages represent a minimum age for the fracturing (i.e., the dates represent the age of the carbonate deposition and not necessarily the age of the preexisting fracture).

Reviewers incorrectly interpreted the work of Carr (1984), where the rates of displacement for the Windy Wash Fault were 0.3 meter (1 foot) per 1,000 years during the period of time from 12.9 to 11.7 million years ago, not at the present time. Discussions by the USGS (1984) suggest that the age of block-forming faults near Yucca Mountain, based on the stratigraphic relationship of the Timber Mountain Tuff to Paintbrush Tuff, is between 12.5 and 11.4 million years.

The discussion of strike-slip faulting has been expanded in the final EA to include both major regional strike-slip zones (Section 3.2.2 of the final EA) and to review evidence for lateral movement on faults at and near the site.

Earthquake probabilities. The analysis of the likelihood of faulting and strong ground motion at the Yucca Mountain site was the object of criticism from a number of reviewers. Objections were raised on the exclusion of Yucca Mountain faults from calculations of recurrence rates for large earthquakes near and accelerations at the site, despite the acknowledgment that some faults at Yucca Mountain may be potentially active. Commenters suggested that the potential for future seismicity was not adequately assessed in support of the favorable condition (Section 6.3.1.7.3 of the EA) and that strike-slip faulting should be considered in analyses of the potential for earthquake activity. Reviewers expressed the importance of examining the late Quaternary record to examine short-term, cyclic tectonic trends and also questioned the recurrence rate of major earthquakes in the area given in a preliminary version of Carr (1984). A commenter suggested that surficial warping or faulting due to ground-water withdrawal be assessed. One reviewer requested a wording change concerning the connection between volcanism and surface faulting during the Quaternary.

Response. The calculation of peak acceleration requires a list of faults that are thought to represent the greatest hazard to the site and for which dimensions are well known. At the time of preparation of the seismic-hazard prediction reported by USGS (1984) and Rogers et al. (1977), the fault map (Scott and Bonk, 1984) of the Yucca Mountain site was not available. Although stress measurements indicate that north-trending faults at Yucca Mountain are so oriented that slip may be possible, confidence in the lengths and slip histories of these faults is not sufficient at this time to estimate magnitudes, although estimates will be made during site characterization. Further, the attenuation curves of Schnabel and Seed (1973) used to compute ground-motion estimates for the EA are outdated; newer relationships are presented in Section 6.3.3.4.5 and will be used for seismic hazard evaluations during site characterization. A table of recurrence estimates compiled from available literature for the NTS region for magnitudes of 7, 6, and 5 was added to Section 6.3.1.7.5 of the final EA.

During site characterization, more thorough investigations of seismicity, strike-slip and normal faults of Quaternary age, and attenuation

parameters will permit an improved analysis of the potential for faulting near Yucca Mountain. The recurrence estimate of Carr (1984) has been deleted from Section 6.3.1.7.6 of the EA because of a change in the supporting reference and at the request of the reviewers.

It seems unlikely that warping and faulting due to ground-water withdrawal are possible in locations such as Yucca Mountain where the water table is at least 500 meters (1,640 feet) below the surface. As requested, the sentence in potentially adverse condition 1 in Section 6.3.1.7.4, has been changed to read "... there is suggestive evidence that ... surface faulting may have accompanied the volcanism ..."

Faulting effects on ground-water flow. Several commenters suggested that evidence does not support the conclusion that tectonic processes, specifically faulting, that could adversely affect ground-water flow are not likely at the site (potentially adverse condition 6 in Section 6.3.1.7.4). Reviewers felt that faulting could increase hydrologic flux and travel times and alter the depth to the water table. One reviewer argued that the potential for disruption of the ground-water system should be evaluated for a 100,000-year time period under the full range of conditions expected during that time frame.

Response. The nature of flow under unsaturated conditions in a fractured porous medium (Wang and Narasimhan, 1985) makes it unlikely that the development of new fractures could alter flow conditions to any extent. At Yucca Mountain the water table is at least 500 meters (1,640 feet) below the surface. The DOE concludes that changes in the ground-water flow system are highly unlikely to lead to significant increases in radionuclide transport during the 10,000-year period specified in the DOE siting guideline (10 CFR 960.4-2-1) and thus potentially adverse condition 6 in Section 6.3.1.7.4 of the EA is not present at Yucca Mountain.

Issue: Potential for tectonically induced loss of containment

Reviewers of the draft EA submitted 36 comments directly addressing the potential for radionuclide release due to future tectonic processes or events. As a result, all comments in this issue directly or indirectly challenge the DOE findings on the favorable condition (Section 6.3.1.7.3), the qualifying condition (Section 6.3.1.7.1), or the disqualifying condition (Section 6.3.1.7.5) as detailed in the EA. The favorable condition states that Quaternary rates of igneous and tectonic activity suggest that there is a less than one in 10,000 chance over the next 10,000 years of release of radionuclides to the accessible environment. The first two topics in this issue cover challenges to the finding on the favorable condition based on potential for future volcanic and seismic disruption. Preliminary qualification of the site is possible as long as release of radionuclides above those allowable is not judged to be likely in the future. The site will be disqualified if the Quaternary record suggests that ground motion or fault movement is likely to lead to a loss of waste isolation. Questions on these final two conditions are addressed under the third topic. The following topics are entitled: challenges to findings regarding volcanism, challenges to findings regarding seismicity, and challenges to qualifying and disqualifying conditions.

Challenges to findings regarding volcanism. Several commenters suggested that the favorable condition is not met at Yucca Mountain on the basis of either the record of volcanism near the site or the inadequacy of the volcanic record.

Response. As discussed in the first issue, small-volume basaltic volcanism is thought to be the most likely form of future volcanism in the southern Great Basin. Exhumation of a repository by explosive cratering associated with hydrovolcanism is unlikely; the depth of burial of the repository is about four times the depth of craters formed by such processes (Crowe et al., 1985). The most recent probability calculations for the eruption of basalts at the site is between 4.7×10^{-4} and 3.3×10^{-6} for a 10,000-year period. The smaller probability clearly meets the favorable condition, and the higher bound does not. This conclusion is based on an assumption that penetration of the repository by basalts will lead to radionuclide releases. A study by Link et al. (1982) assessed the potential radionuclide releases associated with volcanic activity (see EA Section 6.3.1.7.6). Work completed during site characterization will assess the most appropriate probability value based on an evaluation of data assumptions and on structural controls of past volcanic activities in the region. Until this work is completed, it is concluded that the favorable condition is not present and the EA has been revised to reflect this.

Challenges to findings regarding seismicity. Other reviewers suggested that the favorable condition is not met at the site because of the probability that faulting and ground motion will directly cause a loss of waste isolation or because of potential changes to hydrologic conditions resulting from seismic activity. Commenters noted that seismicity was not evaluated in support of the favorable condition.

Response. The draft EA did not present a thorough analysis of the probability that earthquakes could disrupt waste isolation at the site because such calculations are not yet available. In the event of seismicity in the vicinity, the risk of damage to underground tunnels and postclosure structures is thought to be small because tunnels in tuffaceous rock have been observed to remain stable during nearby underground nuclear testing. More importantly, with the upper bound on flux thought to be present within the potential host rock (0.5 millimeter (0.02 inch) per year, Wilson, 1985), even direct fracture disruption of waste disposal containers in the repository is unlikely to lead to releases of radionuclides to the accessible environment at a sufficiently fast rate to exceed the EPA release limits. To saturate the deepest portion of the repository, the water table would have to rise a minimum of 185 meters (600 feet), which is an unrealistic occurrence.

Challenges to qualifying and disqualifying conditions. Challenges to conclusions on the qualifying condition (one commenter) and to the disqualifying condition (several commenters) were based primarily on the hypothesis that ground motion, faulting, and accompanying perturbations to hydrologic conditions could result in significant release of radionuclides. Most commenters suggested that evidence indicates the potential for a large earthquake over the next 10,000 years. One commenter cited the potential for disruption of the repository due to nuclear testing at the Nevada Test Site. Several commenters questioned the reliance on low water flux to support the absence of the tectonics disqualifying condition.

Response. No mechanisms have been identified that suggest a potential for unallowable loss of radionuclides from the engineered barrier system and transport to the accessible environment. The USGS (1984) estimates that the Bare Mountain Fault, 14 kilometers (9 miles) from the site, is capable of producing a magnitude 6.8 earthquake resulting in an acceleration of 0.4g at the surface of the site. Larger accelerations are possible should active faults exist closer to the site. Only three small earthquakes (magnitudes less than 2) have been recorded at Yucca Mountain during 4 years of intensive monitoring. In addition, nuclear tests are confined to distances of 40 to 50 kilometers (25 to 30 miles) from the site, and aftershocks generally are restricted to distances within 14 kilometers (9 miles) of ground zero. During site characterization, seismic-design analysis by experts in the field of hazard assessment will establish appropriate seismogenic sources for consideration of preclosure and postclosure engineering and geologic structures.

Most importantly, loss of waste isolation due to disruption of the repository by strong ground motion or even direct fracturing alone is highly unlikely. Loss of waste isolation requires a medium capable of dissolving and transporting sufficient radionuclides to the accessible environment within the prescribed period of time. If the flux within the host rock is as low as currently thought (less than 0.5 millimeter (0.02 inch) per year, Wilson, 1985), there will be insufficient flux to cause an unacceptable release of radionuclides (Sinnock et al., 1984).

New fractures produced by faulting would be likely to have negligible effects on hydrologic flow through unsaturated fractured porous rock (Wang and Narasimhan, 1985).

The only possible mechanism for release would be the penetration of the repository by sufficient magma and further eruption of magma so that dispersal of some radionuclides could occur. The probabilities of magmatic penetration of the repository over a 10,000 year period range from 4.7×10^{-4} to 3.3×10^{-6} , and the consequences of volcanic events, as predicted by Link et al. (1982), have been added to the final EA in Section 6.3.1.7.6.

In addition, adverse consequences of any release of waste are predicted to be small. The final EA maintains the findings of the draft EA that (1) the evidence does not indicate that the Yucca Mountain site is disqualified and (2) the evidence does not indicate that the site is not likely to meet the qualifying condition for postclosure tectonics.

C.5.8 HUMAN INTERFERENCE (NATURAL RESOURCES)

The Human Interference technical guideline deals with the potential for the site to contain natural resources that could be economically attractive and thereby cause future interference with the repository. Forty-one comments received in this category have been subdivided into four issues: (1) Mineral Resources, (2) Water Resources, (3) Geothermal Resources, and (4) Miscellaneous.

Issue: Mineral resources

Twenty-three comments were received on the mineral resources issue. These comments address the potential for mining operations at or near the Yucca Mountain site to exploit the mineral resources of the area. The topics addressed include: mineral resource potential, mineralization of calderas, economic mining contributions, geochemical sample reporting, and editorial changes.

Mineral resource potential. Several commenters indicated that the U.S. Department of Energy (DOE) had no basis for concluding, through literature review, that Yucca Mountain does not have an economically feasible potential for mineral resource exploitation. In addition, these comments indicated that all relevant data had not been considered and that other data were misrepresented.

Response. The DOE developed its position regarding the mineral resources of Yucca Mountain by assessing the results of the following activities:

1. Mineral inventories were conducted by literature review (Bell and Larson, 1982) and by combined literature review and field investigation (Quade and Tingley, 1983). The results indicated that there is no evidence of past mining activity at Yucca Mountain nor any evidence of existing economic mineralization. Results also indicated that there are no economically significant nonmetallic mineral deposits located at Yucca Mountain that cannot be found in economical deposits elsewhere in Nevada.
2. Field exploration and geologic mapping was conducted by the U.S. Geological Survey (Christiansen and Lipman, 1965; Lipman and McKay, 1965; Scott and Bonk, 1984) for Yucca Mountain and surrounding areas. No evidence of economic mineralization was reported or mapped.
3. Exploratory boreholes at and near the Yucca Mountain site have been drilled. Cores and cuttings derived from these boreholes are routinely analyzed by geochemical methods. No mineralization has been found of economic importance. A sample from drill hole USW G-1 taken at 1,072 meters (3,515 feet) below the surface showed "... an abrupt increase in the intensity of alteration, presumably caused by hydrothermal solutions ..." (Spengler et al., 1981). An analysis of the sample showed that it contained 0.64 ounce per ton silver and 0.02 ounce per ton gold (reported as parts per million in the reference). These concentrations are not economical at the surface, let alone at a depth of 549 meters (1,800 feet) below the water table.

The preceding evidence establishes a strong defense for the position that no known economic mineral resources are present at Yucca Mountain. The evaluation of mineral resources in the Environmental Assessment (EA) indicates that the potential for significant amounts of minerals to occur at the site is low.

Mineralization of calderas. Some commenters stated that Yucca Mountain sits on the edge of the Crater Flat Caldera and that this and 75 percent of all calderas in Nevada are mineralized.

Response. The rocks exposed at Yucca Mountain are chiefly the products of volcanic-tectonic structures known as calderas that partially coincide in space and time. McKee (1979) evaluated the generic relationship of more than 30 calderas and their volcanic products to the distribution of known ore deposits in Nevada. Of 98 mining districts in Nevada with \$1 million or more production of gold, silver, copper, lead, zinc, mercury, antimony, and iron, only 2 are within calderas, and only 5 are in silicic tuffs related to calderas (McKee, 1979). This is significant considering that ash-flow tuff of Tertiary age is the most abundant rock type exposed in Nevada (constituting half of the total surface outcrops) and that 93 percent of the major metal-mining districts in Nevada are in rocks other than silicic tuff (McKee, 1979). This strong negative correlation indicates that large base- and precious-metal deposits in Nevada are generally not associated with calderas or the products of caldera evolution.

Economic mining contributions. A few comments were directed at the DOE's dismissal of the contribution of mineral and mining operations to the economy.

Response. The numbers that the DOE cited for mining production and yield were used to define the relative size of an operation. Regardless of the worth of any existing or future operation (including the Wahmonie District), these mining activities will not be impacted since they lie outside the controlled area. Mineral-resource surveys in the area have been conducted and are presented in the EA. Further evaluations will be undertaken during site characterization.

Geochemical sample reporting. Some commenters stated that geochemical investigations of core samples were not reported in the draft EA.

Response. These data have been included in the final EA. In addition, expanded analyses will occur during site characterization. Samples from existing and future boreholes will be analyzed using x-ray fluorescence and neutron activation analysis for trace elements.

Editorial changes. Various sentence and word changes as indicated in the response were suggested.

Response. In Section 3.2.4.2 the words "mining operations" have been revised to read "exploratory and mining operations" to encompass all practices associated with mining. In the same section, a sentence has been added that reads "Lead and copper were also historically important minerals in northern and central Nevada."

Section 3.2.4.3 has been revised and reorganized to indicate that "Fluorite mineralization, judged to be of local significance, is widespread in Bare Mountain, 16 kilometers (10 miles) west of the site" (Bell and Larson, 1982).

Issue: Water resources

Eight comments were associated with the potential for ground-water resource exploitation. The majority of the comments concerned the availability of water for possible future communities in Jackass Flats, east of Yucca Mountain. One commenter stated that the potential for ground-water extraction at Crater Flat, west of Yucca Mountain, was not considered. A few commenters stated that the draft EA discussions failed to consider the impact on deep regional aquifers and the interconnectivity between aquifers. In addition, it was stated that the shallow carbonate aquifer beneath Yucca Mountain meets safe drinking-water standards.

Response

It is most likely that future developments would occur in areas with easy access to reliable, shallow water resources. However, future use of water by a possible townsite in Jackass Flats would not impact the isolation performance of the repository because the thick, unsaturated zone and very low flux are the major reasons that radionuclides will not be released from the repository. Pumping of water from the saturated zone underlying the repository would not impact the flux and low water content in the repository zone. Furthermore, if the water table dropped due to overuse, the travel time from the repository to the accessible environment would increase.

In general, development of future communities would occur where a reliable and shallow source of water could be obtained. The probability of developments of various size and location will be further investigated during site characterization.

Waddell (1982) discusses the three ground-water basins within the regional ground-water system in the Yucca Mountain area. This study is reviewed in Section 2.1 of the EA. The deep aquifer is unlikely to be a potential source within the Alkali Flat-Furnace Creek Ranch ground-water basin unless the shallow tuff-alluvial aquifer was depleted. This is unlikely to occur under any reasonable use scenario. It is true that in the very distant future (1,000 to 10,000 years), changing climatic conditions or abnormally excessive water usage could change relative head pressures. However, for the immediate future (less than 1,000 years), it is not deemed a plausible scenario that water users would drill to the deep aquifers.

The shallow aquifer beneath Yucca Mountain is not a carbonate aquifer, but a tuff-alluvial aquifer.

Issue: Geothermal resources

Four comments were received relative to the potential for economically feasible geothermal resources in the area of Yucca Mountain and the proposed repository site. The comments address the DOE statement that there is "... no potential for any commercially attractive geothermal resources."

Response

The potential use of the low-temperature geothermal energy located in the Amargosa Valley does not have a bearing on the impacts of a repository at

Yucca Mountain because the Amargosa Valley is outside of the controlled area. The area around Yucca Mountain is extremely well known in terms of heat flow. More than 60 wells (some as deep as 1,830 meters (6,000 feet)) have been drilled and analyzed. The data show the absence of any readily and economically accessible geothermal resources. As indicated in the EA, temperatures at exploitable depths are about one-third to one-ninth the temperature required for commercial power generation. Further studies during site characterization will help to confirm current understanding of geothermal resource potential.

Issue: Miscellaneous

Six comments were received and categorized as miscellaneous. The topics addressed include: natural resources present, radionuclide migration via openings, and editorial changes.

Natural resources present. One commenter suggested that the evidence presented under the Human Interference technical guideline does not support the conclusion that no valuable natural resources are present at Yucca Mountain.

Response. The absence of commercially attractive natural resources at Yucca Mountain, and the estimated low mineral-resource potential of the site, are addressed in sections 6.3.1.8 and 3.2.4 of the EA and are covered in detail in the cited references. Available evidence does not suggest the presence of natural mineral resources at Yucca Mountain as discussed in Section C.4.1.1.

Radionuclide migration via openings. Two commenters suggested that because the DOE stated that any commercial drilling or mining operations could create significant pathways for radionuclide migration, the shafts and boreholes of the repository would also cause this problem. In addition, it was noted that the DOE cannot tell if underground testing may have caused potential pathways for radionuclides.

Response. If nuclear waste is placed in a future repository at Yucca Mountain, all boreholes and shafts will be filled and sealed with materials which have equivalent or better isolation capabilities than the natural system. All underground testing has been conducted at distances far removed from the site, such that there is believed to be no potential for effects at the site (See Section C.6.4).

Editorial changes. Some commenters suggested editorial changes to EA discussions.

Response. The reference citation of Lipman and McKay (1965) has been added to Section 6.3.1.8.2; this section has been revised to read: "Geothermal resources in the area were inventoried by Garside and Schilling (1979) and evaluated by Trexler et al. (1979)."

C.5.9 POSTCLOSURE SITE OWNERSHIP AND CONTROL

Thirteen comments were received in this category. Several comments were requests for the U.S. Department of Energy (DOE) to explain why an additional 50,000 acres of public land now managed by the Bureau of Land Management (BLM) would be required for the repository. Another request was for a map in the final Environmental Assessment (EA) indicating the controlled area and the site.

Many commenters stated that the discussions in the draft EA are inadequate in regard to current and future land ownership and water rights. The contentions were that the discussions were inadequate considering (1) that land-withdrawal actions required for the Nellis Air Force Range have been before Congress for eight years, (2) that the western Shoshone Indian Tribe has filed claim to a large part of Nevada, including Yucca Mountain, (3) that the U.S. Air Force (USAF) has requirements for air space in this area, and (4) the Nevada role in designating the area as a repository site. The confidence that the DOE has expressed with regard to land and water acquisition for the repository were therefore believed to be unfounded.

Finally, one commenter addressed the questions of monitoring and safeguarding the repository after closure.

Response

Approximately 5,000 acres of land now managed by the BLM would be required for withdrawal from public use if Yucca Mountain were recommended as a repository site. The 50,000-acre figure in Section 5.2.3 of the draft EA was an error and has been corrected in the final EA. Also included in the final EA is a figure (Figure 3-1) showing the approximate boundary of the site which is analagous to the controlled area (approximately 24,710 acres) of which about 5,000 acres are managed by the BLM. According to 40 CFR Part 191, the boundary of the controlled area is not to exceed 5 kilometers (3 miles) in any direction from the outer boundary of the original location of the radioactive wastes in a disposal system.

There are several differences between the land-withdrawal situation for the Nellis Air Force Range and that which would be required for a repository at Yucca Mountain. The primary difference, however, is that the Nellis Range has remained a restricted installation, therefore reducing the urgency for Congress to act on the withdrawal request.

The land claims of the western Shoshone Indian Tribe have recently been decided in favor of the United States (United States v. Dann and Dann, 1985).

The DOE is aware of the present-day aircraft flight requirements of the operations conducted at the Nellis Air Force range. The DOE, through past negotiations with the USAF, established the existing operational restrictions for flights through DOE-controlled air space at the Nevada Test Site (NTS), designated R4808W and R4808E. Currently, R4808E is closed to all military aircraft, whereas R4808W is open to military aircraft upon request. In the future, the DOE will designate other air corridors to the USAF if conflicts arise.

The role of the State of Nevada in the ultimate designation of Yucca Mountain as a repository site is limited to the State disapproving the recommendation of the site for a repository. The U.S. Congress, however, has the power to override State disapproval by passing a resolution of repository siting approval (NWPA, 1983).

If it becomes necessary to acquire privately held water rights for the repository, a situation not expected based on available information, the DOE would purchase these rights or begin Federal condemnation proceedings. Such negotiations or proceedings are not expected or planned. Because no existing privately held rights or encumbrances have been identified at the site, the DOE considers that the qualifying condition has been met. Whether superior rights to the water in the same underground source exist with respect to points of extraction outside the NTS has not yet been determined.

The license application for a repository will include a safety analysis report that will address monitoring and safeguarding of the site after closure of the repository. The contents that are required in the safety analysis report are described in 10 CFR 60.21(c). Furthermore, the Environmental Protection Agency (40 CFR Part 191) requires that permanent markers be erected to designate the disposal site.

C.5.10 POSTCLOSURE SYSTEM GUIDELINE

The 14 comments received and classified under this category address concerns for the performance of the entire waste-disposal system after the repository has been closed. The comments were further categorized into three issues: (1) Degree of Conservatism and Data Uncertainties, (2) Effects of Ground-water Flow, and (3) Miscellaneous.

Issue: Degree of conservatism and data uncertainties

Nine commenters addressed the concern that the U.S. Department of Energy (DOE) has presented nonconservative and uncertain data with respect to the repository total waste system. The topics addressed include: guideline conclusions, release rates, degree of conservation, and favorable and potentially adverse conditions.

Guideline conclusions. A few commenters suggested that the conservative quantitative predictions reviewed in Section 6.3.2.2.1 do not lend considerable confidence that after site characterization Yucca Mountain will meet the postclosure system guideline; in fact, such a conclusion was considered overly optimistic and unsupported by the data. The analyses and in turn the conclusions of Section 6.3.2 do not reflect uncertainties affecting most subsystem parameters according to these commenters.

Response. The DOE disagrees with these assertions. The lines of evidence available at the time the draft Environmental Assessment (EA) was written were sufficient to generate considerable, if not complete, confidence in the minds of the responsible investigators that the Yucca Mountain site

could be shown to meet the postclosure system guideline after certain hydrologic and tectonic uncertainties were cleared up during the site characterization phase. Furthermore, uncertainties in most system parameters were taken into account in the analyses supporting the conclusions of Section 6.3.2 either by presenting a range of values of parameters and performance measures as in tables 6-41 (Assessment of release from normal preclosure operations) and 6-45 (Preliminary estimates of cumulative radioactivity released to the accessible environment from a repository containing 70,000 MTHM) in Section 6.4.2 or through the use of conservative assumptions.

The conservative assumptions listed in Section 6.3.2.2.1 of the draft EA are examples of the many assumptions used in the studies (Thompson et al., 1984; Sinnock et al., 1984) that were cited as supplementing the evidence from the preliminary postclosure performance analysis (Section 6.4.2). Brief summaries of some of the results of these studies were given in Section 6.3.2.2.1, but the reader should consult the study reports to gain full appreciation of the range of assumptions and system parameters used in making these preliminary estimates of system performance. The estimated ranges of uncertainty for each of the performance measures tested in Section 6.4.2 are quoted in tables 6-44 (Summary of values and conditions used in preliminary system performance analysis--reference case) and 6-45 (Preliminary estimates of cumulative radioactivity released to the accessible environment from a repository containing 70,000 MTHM) of the draft EA.

Release Rates. Some commenters asserted that the release rates calculated in Section 6.3.2 of the draft EA are nonconservative because there is no indication that spent fuel will be reprocessed into a borosilicate glass waste form; also, radionuclides may be concentrated in the voids surrounding the UO_2 in the fuel rods. The solubility would therefore not be limited by the bulk dissolution rate.

Response. It is agreed that the assumption of congruent leaching, limited solely by the solubility limit of the bulk waste form, could in principle lead to nonconservative estimates of the release rate from spent fuel (the reference waste form in the draft EA, but not necessarily the reference waste form used for studies supporting the draft EA). The release rates calculated in Section 6.4.2.2.2 have been recalculated with a slightly different model than was used in the draft EA. A number of assumptions were taken into account to better include uncertainties.

Degree of conservatism. Some commenters noted that the DOE siting guidelines require that a "realistic but conservative" approach be taken in all analyses used to support findings for the technical or system guidelines. These instances of nonconservatism appear in many areas such as geohydrology, geochemistry, and waste-package performance analyses.

Response. The DOE presumes that the major instances of nonconservatism that occur in the draft EA are contained in the evaluations of the geohydrology and geochemistry technical guidelines, and in the evaluation of the waste disposal container lifetime. Nonconservatism is presumed by the comments to be inherent in (1) the EA assumption of predominant matrix flow at a maximum percolation flux of 1 millimeter (0.04 inch) per year; (2) the assumption that water from the saturated zone of Yucca Mountain (water from Well J-13) will have chemical properties similar to as-yet-untested water

from the vadose zone; and (3) the assumption that attack rates on the waste disposal container wall are bounded by uniform corrosion rates. Revisions to Section 6.3.1.1.5 explain the rationale for flux estimates used in the final EA. The DOE maintains that these assumptions are a reasonable balance between the requirements for "realism" and "conservatism" stated in its own siting guidelines (10 CFR Part 960). Re-evaluations of data and evidence supporting the technical guidelines in question have not changed this opinion: upper bounds on flux of 0.5 millimeter (0.02 inch) per year are justified in Section 6.3.1.1.5 of the present document; the unlikely probability of finding vadose zone ground water with "exotic" chemistry is argued in Section 6.3.1.2; and the lifetime of the waste disposal container is discussed in Section 6.4.2.2.1 with increased emphasis on other possible attack mechanisms.

Favorable and potentially adverse conditions. Commenters suggested that the DOE explain how it will consider favorable and potentially adverse conditions in assessing the ability of the site to meet the systems guidelines. Objections were raised to the discussion of levels of subjective confidence in meeting technical guidelines contained in the first paragraph of Section 6.3.2.2.2; it was maintained that such "confidence levels" are unsupported and irrelevant to an analysis of the postclosure system guidelines, and that the discussion should be removed from the text of the EA.

Response. The DOE intends that the evaluations of favorable and potentially adverse conditions mentioned in the technical guidelines should, during the site-selection process, fulfill roughly the same purpose as is fulfilled by the detailed, often quantitative, analyses of system performance under potentially disruptive or unexpected conditions that are expected by the Nuclear Regulatory Commission in a license application. In other words, evaluations of the technical guidelines must temporarily serve as surrogates for performance analyses of the waste-disposal system which account for unlikely conditions that might occur at the site in the next 10,000 years (climate change, volcanic activity), or changed site characteristics resulting from the continuation of processes currently operating at the site (earthquakes, erosion). The use of technical-guideline evaluations as surrogates for condition-specific analyses must, however, rely heavily on professional judgment attended by expressions of the level of subjective confidence in findings based on that kind of judgment. The evaluations of the technical guidelines in the EA are thus only indirectly related to the analysis of system performance under expected conditions; indeed, the two kinds of results are distinguished in the discussion of the postclosure system guideline (quantitative analysis in Section 6.3.2.2.1, qualitative analysis in Section 6.3.2.2.2).

For reasons mentioned above, the DOE believes that the discussion of levels of subjective confidence contained in Section 6.3.2.2 is highly relevant to the evaluation of the postclosure system guideline; this discussion has been expanded in the present version of the EA in order to clarify and further support the use of the technical-guideline findings as supplementary evidence to be used in arriving at a finding on the postclosure system guideline.

Issue: Effects of ground-water flow

The three comments received regarding this issue address the potential for ground-water flow to disrupt waste inventories of a repository at Yucca Mountain. The topics addressed are: tectonics and ground-water flow, and estimated water flux.

Tectonics and ground-water flow. Commenters claim that the analysis in Section 6.3.2.2.2 of adverse effects on ground-water flow due to tectonic motion is incomplete in that the referenced investigators (Sinnock et al., 1984) did not consider the possibility of tectonic fracturing (increase in fracture density and fracture aperture width) in their parametric analysis using higher flux values. In related comments, the DOE was asked to delete the sentence in Section 6.3.2.2.2 beginning with the words "Current estimates ..." and running to the end of the paragraph; the commenters asserted that there is insufficient support in the EA and in the available literature to draw the conclusion implied by that sentence.

Response. The commenters refer to the argument in Section 6.3.2.2.1 which maintains that tectonically induced increases in fracture density in the host rock (and, implicitly, in rocks between the repository and the water table) would not affect radionuclide migration. The DOE admits that the argument was incomplete and lacked a physical foundation in the draft EA, mainly because some of the supporting technical material had not been formally published at the time the draft EA was printed. The evidential basis for the argument is supplied in the EA through references in sections 6.3.1.1 and 6.3.1.7 to the expanded discussions of the effects of rock fracturing on hydraulic parameters. The sentence to which the comment refers has been changed, but the nature of the conclusions drawn there has not changed.

Estimated water flux. The DOE was asked to state the water flux estimated for that point where proposed Environmental Protection Agency release limits would be exceeded.

Response. Based on figures 27 through 30 in Sinnock et al. (1984), in order to cause the proposed Environmental Protection Agency release limits to be exceeded at the water table, a flux of more than 20 millimeters (0.79 inch) per year (a totally unrealistic assumption) would be required.

Issue: Miscellaneous

One commenter stated that the DOE should use the 10 CFR Part 60 definition of the engineered-barrier system in the analyses and evaluations of Section 6.3.2. Another commenter felt that a statement made in the EA about the lack of water minimizing corrosion of the waste disposal container, the dissolution of the waste, and the transport of radionuclides was not supportable.

Response

The description of the waste-disposal system in Section 6.3.2.1 has been changed in the final EA to the following:

"The waste-disposal system consists of a natural-barrier system (the geologic setting at the site) and an engineered-barrier subsystem (the waste package, and the mined repository excluding boreholes, shafts, and seals)."

The definition of the engineered-barrier system implicit in this description is consistent with the definition in 10 CFR Part 60 and with the definition used in estimates of postclosure performance in Section 6.4.2.

The statement regarding waste disposal container corrosion is accurate; limited water will indeed minimize stainless steel corrosion. Without corrosion, waste cannot be dissolved, and no subsequent transport of waste can occur.

C.5.11 ASSESSMENT OF POSTCLOSURE PERFORMANCE

The 51 comments addressing the postclosure performance of Yucca Mountain as a potential nuclear waste repository cover all aspects of the engineered-barrier subsystem and the natural-barrier subsystem. Specifically addressed are the five issues of: (1) Waste Package Performance, (2) Hydraulic Flux and Fracture Flow, (3) Ground-water Travel Time, (4) Radionuclide Retardation, and (5) Analysis of Radionuclide Releases to the Accessible Environment.

Issue: Waste package performance

Fourteen comments were received regarding the waste package performance issue. Concerns were expressed about the corrosion of steel waste disposal containers and the rates and concentrations of radionuclides released from the waste package.

Concerns were expressed that the U.S. Department of Energy (DOE) assumption of uniform corrosion of steel waste disposal containers did not take into account that scratched waste disposal containers and/or welded joints may be the realistic mode of waste disposal container failure. Also, some commenters indicated that the water used in laboratory experiments to investigate corrosion rates was not representative of actual conditions at Yucca Mountain. One commenter asked what effect over-packing would have on waste disposal container integrity.

Some commenters noted that radionuclide solubilities and release rates from the waste package are poorly known and that the resulting concentrations released from the waste package into the repository environment are uncertain.

Response

Corrosion testing of various waste disposal container steels has not been performed in water taken directly from the unsaturated zone at Yucca Mountain. The reason for this is the practical difficulty of extracting water from unsaturated subsurface rocks without changing the composition of the water by the process of extraction.

Therefore, the DOE has made the reasonable assumption that the chemistry of the waters in the saturated zone beneath Yucca Mountain is representative of waters in the unsaturated zone. (See complete discussion supporting the representative nature of Well J-13 water in Section C.5.2 of this document.) The chemistry of waters in the saturated zone beneath Yucca Mountain is likely to be similar to water from Well J-13, and it is Well J-13 water that is being used in corrosion experiments. Tests to date (July 1985) with exposure times up to two years under a variety of irradiation conditions and water concentrations have shown no attack on crevices (simulated scratches). Therefore, it is concluded that the assumption of uniform corrosion and inferences derived from laboratory experiments are reasonable. Corrosion testing is continuing and water from the unsaturated zone will be obtained and analyzed during site characterization.

In assessing postclosure performance, no over-packing was assumed because no such activity is currently planned at Yucca Mountain.

Radionuclide solubilities and ranges under Yucca Mountain conditions were not published at the time the draft Environmental Assessment (EA) was being written. Since then estimates for some radionuclides have been published (Ogard and Kerrisk, 1984) and have been used to assess the range of release rates and concentrations in the EA. In the draft EA, a reference was made to spent-fuel leaching tests by Wilson and Oversby (1984) to justify using a saturation-limited model for release from the waste form to any water that is inside a breached waste disposal container. This model was then used to predict less than 1 part in 100,000 release across the boundary of a waste disposal container using a simple mass-transfer model. More recent tests by Wilson and Oversby (1985) were made with water from Well J-13 and compared with earlier tests using deionized water on spent fuel. The release rates using Well J-13 water were less than or equal to those obtained using deionized water. In addition, colloidal (or particulate) uranium, which was seen in deionized water, was not found in tests with Well J-13 water. Thus the DOE believes the leach rates used in the preliminary performance assessment are conservative.

Issue: Hydraulic flux and fracture flow

Twelve comments were received regarding hydraulic flux and fracture flow in the postclosure performance assessment (Section 6.4.2) of the draft EA. Two topics were addressed: flux value discrepancies and various aspects of fracture flow.

Flux value discrepancies. Eight of the commenters pointed out that the estimates of hydraulic flux given in the discussion of the geohydrology guideline (Section 6.3.1.1) are larger than the flux values used in the analysis of postclosure performance (Section 6.4.2).

Response. The commenters are correct that inconsistent hydraulic parameters, including flux, were used in sections 6.3.1.1 and 6.4.2. These differences have been corrected in the final EA so that the values and derived estimates used in performance analysis are the same as those presented in the discussion of the geohydrology guideline.

Various aspects of fracture flow. Four commenters indicated that the discussion of water flow in fractures was inadequate, particularly in reference to the unsaturated zone and the level of flux at which fracture flow would begin. Also noted was a discrepancy between the conceptual hydrologic model, which allows fracture flow in the Tiva Canyon tuff, and a statement in Section 6.4.2.5.1 concerning high matric potentials above and around the repository and consequent drainage of fractures to the rock matrix.

Response. Admittedly, the discussion of fracture flow is not presented in detail in the analysis of postclosure performance. However, additional information on fracture flow and a discussion of the level of flux believed necessary to start fracture flow is contained in the discussion of the geohydrology guideline (Section 6.3.1.1 of the final EA).

The DOE agrees that there was a discrepancy between statements on fracture flow in the conceptual hydrologic model and a statement on fracture flow in the analysis of performance in Section 6.4.2.5.1. Both sections have been modified in the final EA to reflect the concept that fracture flow in the unsaturated zone is less likely in nonwelded rocks with high matric potential. However, the current travel-time model for the unsaturated zone includes both matrix and fracture flow (see Section 6.3.1.1.5).

Issue: Ground-water travel time

Five comments were assigned to this issue. A few commenters stated that there were inconsistencies in the calculated ground-water travel times from the repository to the accessible environment. A few comments were received regarding the calculations used to estimate ground-water travel time, and one commenter addressed the overall question of contamination from the repository reaching the accessible environment.

Response

There was a difference in the travel-time calculations between the discussion on the geohydrology guideline (Section 6.3.1.1.3) and the discussion of performance (Section 6.4.2.2.2) in the draft EA. The former estimated a 25,000-year travel time, and the latter a 47,000-year travel time. The source of the difference is that differing values were assumed for effective porosity and length of travel path in the Calico Hills tuff below the repository horizon and the static water level. In the final EA a consistent set of values and calculation methods has been used to conform with those given in the discussion of the geohydrology guideline. Long travel times help to ensure that radioactive decay will have reduced many potential radionuclides to low levels by the time they reach the accessible environment.

Issue: Radionuclide retardation

Four comments were received questioning the applicability to natural conditions at Yucca Mountain of the retardation values obtained from laboratory experiments and used in the analysis of postclosure performance. Specifically questioned was the use of equilibrium sorption and porous flow which may not apply in the unsaturated zone or in fracture flow. Also

questioned was knowledge of water chemistry at Yucca Mountain and the possible effects of that chemistry on retardation values obtained in the laboratory.

Response

Equilibrium sorption values used in the analysis of performance (Section 6.4.2) are justified under the assumption of porous flow, because times for the equilibration of radionuclides between solid and liquid phases are small (in the order of tens of days) compared with transit times of a parcel of water in the matrix flow (approximately 10 years to move 1 centimeter at 1 millimeter per year flux). Current travel-time modeling includes both matrix and fracture flow depending upon relative values of flux and saturated matrix hydraulic conductivity (see Section 6.3.1.1.5).

It is true that the chemistry of waters in the unsaturated zone are not precisely known, but as shown in the geochemistry guideline (Section 6.3.1.2) many sorption experiments have been made using water from Well J-13. There is no reason to believe water from Well J-13 differs significantly from water in the unsaturated zone. For comparison the matrix waters from Rainier Mesa are very similar to the Yucca Mountain site because both areas are composed chiefly of ash-flow tuffs and associated rocks (see Section C.5.2 for a complete discussion of water chemistry). Nevertheless, the validity of this assumption will be confirmed during site characterization.

Issue: Analysis of radionuclide releases to the accessible environment

Sixteen comments were received regarding the preliminary analysis of postclosure performance (Section 6.4.2). These covered two main topics: contamination of land, air, and ground water; and data and modeling uncertainties.

Contamination of land, air, and ground water. Ten comments were received asking or suggesting that the land, air, or ground water near Yucca Mountain would become contaminated if a repository were constructed.

Response. By law, a high-level nuclear waste repository must be licensed by the Nuclear Regulatory Commission and must meet Environmental Protection Agency (EPA) health and safety requirements protecting the land, air, and water. The preliminary analysis of the performance of a repository at Yucca Mountain, given in Section 6.4.2, indicates that the predicted radionuclide releases in the ground water to the accessible environment at 100,000 years are well below the releases permitted at 10,000 years by the EPA requirements (40 CFR 191.13). A much more complete analysis will be completed during site characterization.

Potential exposures to radionuclide gas emanation are presented in Section 5.2.9.1 of the EA. The acceptable levels of radionuclide release are not presented in the draft EA on a radionuclide specific level. However, the regulatory criteria pertaining to releases were presented in Table 6-46 (Comparison of regulatory criteria and the results of preliminary system performance analyses for a repository at Yucca Mountain) of the draft EA.

Similar preliminary analyses of possible releases from the repository to the land and air were not made in the preliminary analysis of performance presented in Section 6.4.2. The reader is referred to Section 6.2.2.1 (Preclosure system guideline: radiological safety) for a discussion of possible releases during the operation period of a repository and to Section C.5.11 (Geochemistry) for a discussion of release of gaseous radionuclides during the postclosure period.

At this time the question of gaseous or vapor transport in the unsaturated zone at Yucca Mountain has not been examined in detail. This mode of transport at Yucca Mountain will be thoroughly investigated during site characterization.

Data and modeling uncertainties. Six comments were received calling attention to uncertainties in data, assumptions, and models used in the preliminary analysis of postclosure performance. Included were comments on the use of 5-year-old spent fuel as the initial inventory, uncertainties in release rates from the engineered-barrier system, the conservative nature of assumptions used, uncertainties in models used, and contradictory statements in the draft EA about the degree of confidence in meeting the postclosure system guideline (10 CFR 960.4-1).

Response. With regard to the assumption of the initial inventory, the performance assessment calculations assumed 10-year-old spent fuel. One commenter suggested that 5-year-old fuel would be overly conservative and another suggested the range in types of waste forms should be more thoroughly discussed. Radionuclides that may contribute to release in the 10,000- to 100,000-year period (carbon-14, technetium-99, and iodine-129) all have half-lives greater than 1,000 years. Assumptions of older or reprocessed waste would make no significant differences in the calculated releases.

With regard to uncertainties in release rates and models used, these are more fully explained in the final EA and the rationale for selecting conservative values is explained.

There were contradictory statements regarding the degree of confidence that Yucca Mountain would meet the postclosure system guideline. The statements indicating unfounded confidence or prejudgment prior to completion of site characterization have been removed or modified to clearly indicate that the analysis is preliminary and subject to later evaluation when more data are available.

REFERENCES FOR CHAPTER C.5

- Bell, E. J., and L. T. Larson, 1982. Overview of Energy and Mineral Resources for the Nevada Nuclear Waste Storage Investigations, Nevada Test Site, Nye County, Nevada, NVO-250, Nevada Operations Office, U.S. Department of Energy, Las Vegas.
- Benson, L. V., J. H. Robison, R. K. Blankennagel, and A. E. Ogard, 1983. Chemical Composition of Ground Water and the Locations of Permeable Zones in the Yucca Mountain Area, Nevada, USGS-OFR-83-854, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Browning, R. E., 1985. Letter from R. E. Browning (NRC) to R. Stein (DOE), June 12, 1985; regarding NRC position on groundwater travel time.
- Bryant, E. A., and D. T. Vaniman (comps.), 1984. Research and Development Related to the Nevada Nuclear Waste Storage Investigations, July 1-September 30, 1983, LA-10006-PR, Los Alamos National Laboratory, Los Alamos, N. Mex.
- Caporuscio, F. A., and D. T. Vaniman, 1985. Iron and Manganese in Oxide Minerals and in Glasses: Preliminary Consideration of Eh Buffering Potential at Yucca Mountain, Nevada, LA-10369-MS, Los Alamos National Laboratory, Los Alamos, N. Mex.
- Carr, W. J., 1984. Regional Structural Setting of Yucca Mountain, Southwestern Nevada, and Late Cenozoic Rates of Tectonic Activity in Part of the Southwestern Basin, Nevada and California, USGS-OFR-84-854, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Christiansen, R. L., and P. W. Lipman, 1965. "Geologic Map of the Topopah Spring NW Quadrangle, Nye County, Nevada," U.S. Geological Survey Quadrangle Map GQ-444, Scale 1:24,000, Washington, D.C.

- Christiansen, R. L., and E. H. McKee, 1978. "Late Cenozoic Volcanic and Tectonic Evolution of the Great Basin and Columbia Intermontane Regions," Cenozoic Tectonics and Regional Geophysics of the Western Cordillera, R. B. Smith and G. P. Eaton (eds.), Geological Society of America Memoir 152, pp. 283-311.
- Claassen, H. C. 1983. Sources and Mechanisms of Recharge for Ground Water in the West-Central Amargosa Desert, Nevada--A Geochemical Interpretation, USGS-OFR-83-542, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Crowe, B. M., K. H. Wohletz, D. T. Vaniman, and E. Gladney, 1985. Volcanic Hazard Studies for the Nevada Nuclear Waste Storage Investigations: Part II, Los Alamos National Laboratory, Los Alamos, N. Mex.
- Czarnecki, J. B., 1985. Simulated Effects of Increased Recharge on the Ground-Water Flow System of Yucca Mountain and Vicinity, Nevada-California, USGS-WRI-84-4344, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- Czarnecki, J. B., and R. K. Waddell, 1984. Finite-Element Simulation of Ground-Water Flow in the Vicinity of Yucca Mountain, Nevada-California, USGS-WRI-84-4349, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- Daniels, W. R., K. Wolfsberg, R. S. Rundberg, A. E. Ogard, J. F. Kerrisk, C. J. Duffy, T. W. Newton, S. D. Knight, F. O. Lawrence, V. L. Rundberg, M. Skyes, G. Thompson, B. Travis, E. Treher, R. Vidale, G. Walter, R. Aguilar, M. Cisneros, S. Maestas, A. Mitchell, P. Oliver, N. Raybold, and P. Wanek, 1982. Summary Report on the Geochemistry of Yucca Mountain and Environs, J. Heiken (ed.), LA-9328-MS, Los Alamos National Laboratory, Los Alamos, N. Mex.
- Dibble, W. E., Jr., and W. A. Tiller, 1981. "Kinetic Model of Zeolite Paragenesis in Tuffaceous Sediments," Clays and Clay Minerals, Vol. 29, pp. 323-329.
- Dudley, W. W., Jr., 1985. Letter from W. W. Dudley (USGS) to D. L. Vieth (WMPO), October 31, 1985; regarding status of on-going neotectonic studies.

ERDA (U.S. Energy Research and Development Administration),
1977. Nevada Test Site, Nye County, Nevada, Final
Environmental Impact Statement, ERDA-1551, Washington, D.C.

Garside, L. J., and J. H. Schilling, 1979. Thermal Waters of
Nevada, Nevada Bureau of Mines and Geology Bulletin 91,
University of Nevada, Reno.

Henderson, T., and L. Benson, 1983. Memorandum from T. Henderson
and L. Benson (USGS) to the Record, October 21, 1983;
regarding geochemical interpretation of UZ-1 water samples.

Henne, M. S., 1982. "The Dissolution of Rainier Mesa Volcanic
Tuffs, and its Application to the Analysis of the Groundwater
Environment," unpublished M. S., University of Nevada, Reno.

Johnson, L. H., 1982. The Dissolution of Irradiated UO₂ Fuel in
Groundwater, AECL-6837, Atomic Energy of Canada Limited,
Pinawa, Manitoba, Canada.

Johnstone, J. K., R. R. Peters, and P. F. Gnirk, 1984. Unit
Evaluation at Yucca Mountain, Nevada Test Site: Summary
Report and Recommendation, SAND83-0372, Sandia National
Laboratories, Albuquerque, N. Mex.

Jones, B. F., 1982. Mineralogy of Fine Grained Alluvium from
Borehole U11g, Expl. 1, Northern Frenchman Flat Area, Nevada
Test Site, USGS-OFR-82-765, Open-File Report, U.S. Geological
Survey, Denver, Colo.

Kerrisk, J. F., 1984b. Solubility Limits on Radionuclide
Dissolution at a Yucca Mountain Repository, LA-9995-MS,
Los Alamos National Laboratory, Los Alamos, N. Mex.

Knauss, K. G., J. M. Delany, W. J. Beiriger, and D. W. Peifer,
1985. "Hydrothermal Interaction of Topopah Spring Tuff with
J-13 Water as a Function of Temperature," Scientific Basis
for Nuclear Waste Management VIII, Materials Research Society
Symposia Proceedings, C. M. Jantzen, J. A. Stone, and R. C.
Ewing (eds.), Vol. 44, Pittsburgh, Penn., pp. 539-546.

Link, R. L., S. E. Logan, H. S. Ng, F. A. Rockenbach, and K. J.
Hong, 1982. Parametric Studies of Radiological Consequences
of Basaltic Volcanism, SAND81-2375, Sandia National
Laboratories, Albuquerque, N. Mex.

- Lipman, P. W., and E. J. McKay, 1965. "Geologic Map of the Topopah Spring SW Quadrangle, Nye County, Nevada," U.S. Geological Survey Quadrangle Map GQ-439, Scale 1:24,000, Washington, D.C.
- McKee, E. H., 1979. "Ash-Flow Sheets and Calderas: Their Genetic Relationship to Ore Deposits in Nevada," Geological Society of America Special Paper 180, pp. 205-211.
- Montazer, P., 1982. Permeability of Unsaturated, Fractured Metamorphic Rocks Near an Underground Opening, Ph.D. thesis T-2540 (Mimeo), Colorado School of Mines, Golden, Colo.
- Montazer, P., and W. E. Wilson, 1984. Conceptual Hydrologic Model of Flow in the Unsaturated Zone, Yucca Mountain, Nevada, USGS-WRI-84-4345, Water-Resources Investigations Report, U.S. Geological Survey, Lakewood, Colo.
- Montazer, P., E. P. Weeks, F. Thamir, S. N. Yard, and P. B. Hofrichter, 1985. "Monitoring the Vadose Zone in Fractured Tuff, Yucca Mountain, Nevada," Characterization and Monitoring of the Vadose Zone, National Water Well Association Symposium, Denver, Colorado, November 19-21, 1985.
- NWPA (Nuclear Waste Policy Act), 1983. "Nuclear Waste Policy Act of 1982," Public Law 97-425, 42 USC 10101-10226, Washington, D.C.
- Ogard, A. E., and J. F. Kerrisk, 1984. Groundwater Chemistry Along Flow Paths Between a Proposed Repository Site and the Accessible Environment, LA-10188-MS, Los Alamos National Laboratory, Los Alamos, N. Mex.
- Oversby, V. M., 1985. The Reaction of Topopah Spring Tuff with J-13 Water at 150 deg. C- Samples from Drill Cores USW G-1, USW GU-3, USW G-4, and UE-25h 1, UCRL-53629, Lawrence Livermore National Laboratory, Livermore, Calif.
- Price, R. H., F. B. Nimick, J. R. Connolly, K. Keil, B. M. Schwartz, and S. J. Spence, 1985. Preliminary Characterization of the Petrologic, Bulk, and Mechanical Properties of a Lithophysal Zone Within the Topopah Spring Member of the Paintbrush Tuff, SAND84-0860, Sandia National Laboratories, Albuquerque, N. Mex.

- Quade, J., and J. V. Tingley, 1983. A Mineral Inventory of the Nevada Test, and Portions of the Nellis Bombing and Gunnery Range, Southern Nye County, Nevada, DOE/NV/10295-1, U.S. Department of Energy, Nevada Operations Office, Las Vegas.
- Quiring, R. F., 1965. Annual Precipitation Amount as a Function of Elevation in Nevada South of 38-1/2 Degrees Latitude, (Mimeo.) U.S. Weather Bureau, Las Vegas, Nv.
- Rogers, A. M., D. M. Perkins, and F. A. McKeown, 1977. "A Preliminary Assessment of the Seismic Hazard of the Nevada Test Site Region," Bulletin of the Seismological Society of America, Vol. 67, No.6, pp. 1587-1606.
- Rundberg, R. S., 1985a. Assessment Report on the Kinetics of Radionuclide Adsorption on Yucca Mountain Tuff, Los Alamos National Laboratory, Los Alamos, N. Mex.
- Rush, F. E., 1970. Regional Ground-Water Systems in the Nevada Test Site Area, Nye, Lincoln, and Clark Counties, Nevada, Department of Conservation and Natural Resources, Water Resources--Reconnaissance Series Report 54, State of Nevada, Carson City.
- Schnabel, P. B., and H. B. Seed, 1973. "Accelerations in Rock for Earthquakes in the Western United States," Bulletin of the Seismological Society of America, Vol. 63, No. 2, pp. 501-516.
- Scott, R. B., and J. Bonk, 1984. Preliminary Geologic Map of Yucca Mountain, Nye County, Nevada, with Geologic Sections, USGS-OFR-84-494, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Sinnock, S., Y. T. Lin, and J. P. Brannen, 1984. Preliminary Bounds on the Expected Postclosure Performance of the Yucca Mountain Repository Site, Southern Nevada, SAND84-1492, Sandia National Laboratories, Albuquerque, N. Mex.
- Smith, R. L., and R. G. Luedke, 1984. "Potentially Active Volcanic Lineaments and Loci in Western Conterminous United States," in Explosive Volcanism: Inception, Evolution and Hazards, National Academy Press, pp. 47-66.

- Spaulding, W. G., S. W. Robinson, and F. L. Paillet, 1984. Preliminary Assessment of Climatic Change During Late Wisconsin Time, Southern Great Basin and Vicinity, Arizona, California, and Nevada, USGS-WRI-84-4328, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- Spengler, R. W., F. M. Byers, Jr., and J. B. Warner, 1981. Stratigraphy and Structure of Volcanic Rocks in Drill Hole USW G-1, Yucca Mountain, Nye County, Nevada, USGS-OFR-81-1349, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Swadley, W C, D. L. Hoover, and J. N. Rosholt, 1984. Preliminary Report on Late Cenozoic Faulting and Stratigraphy in the Vicinity of Yucca Mountain, Nye County, Nevada, USGS-OFR-84-788, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Szabo B. J., and T. K. Kyser, 1985. Uranium, Thorium Isotopic Analyses and Uranium-Series Ages of Calcite and Opal, and Stable Isotopic Compositions of Calcite from Drill Cores UE25a 1, USW G-2, and USW G-3/GU-3, Yucca Mountain, Nevada, USGS-OFR-85-224, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Thompson, F. L., F. H. Dove, and K. M. Krupka, 1984. Preliminary Upper-Bound Consequence Analysis for a Waste Repository at Yucca Mountain, Nevada, SAND83-7475, Sandia National Laboratories, Albuquerque, N. Mex.
- Tibbs, H., 1985. Letter from H. Tibbs (F&S) to J. J. D'Lugosz (DOE/NVO), September 23, 1985; regarding mining experience through faulted welded tuff beds in U12G Tunnel "Rock Mechanics" drift.
- Tillerson, J. R., and F. B. Nimick, 1984. Geoengineering Properties of Potential Repository Units at Yucca Mountain, Southern Nevada, SAND84-0221, Sandia National Laboratories, Albuquerque, N. Mex.
- Travis, B. J., S. W. Hodson, H. E. Nuttall, T. L. Cook, and R. S. Rundberg, 1984. Preliminary Estimates of Water Flow and Radionuclide Transport in Yucca Mountain, LA-UR-84-40 (Rev.), Los Alamos National Laboratory, Los Alamos, N. Mex.

- Trexler, D. T., T. Flynn, and B. A. Koenig, 1979. Assessment of Low-to-Moderate Temperature Geothermal Resources of Nevada, Final Report for the Period April 1978-June 1979, NVO/O1556-1, Nevada Bureau of Mines and Geology, University of Nevada, Reno.
- United States v. Mary Dann and Carrie Dann, 1985. The United States Law Week, February 19, 1985, No. 83-1476.
- USGS (U.S. Geological Survey) (comp.), 1984. A Summary of Geologic Studies through January 1, 1983, of a Potential High-Level Radioactive Waste Repository Site at Yucca Mountain, Southern Nye County, Nevada, USGS-DFR-84-792, Open-File Report, U.S. Geological Survey, Menlo Park, Calif.
- Vaniman, D., J. Downey, D. Bish, J. O'Neil, and S. Levy, 1985. Letter from D. Vaniman (LANL), J. Downey (USGS), D. Bish (LANL), J. O'Neil (USGS), and S. Levy (LANL) to D. L. Vieth (DOE/NVO), TWS-ESS-1-7/85-20, July 17, 1985; regarding impact of Fault-related mineral deposits on site characterization at Yucca Mountain: studies as of July, 1985.
- Waddell, R. K., 1982. Two-Dimensional, Steady-State Model of Ground-Water Flow, Nevada Test Site and Vicinity, Nevada-California, USGS-WRI-82-4085, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- Waddell, R. K., J. H. Robison, and R. K. Blankennagel, 1984. Hydrology of Yucca Mountain and Vicinity, Nevada-California--Investigative Results Through Mid-1983, USGS-WRI-84-4267, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- Wang, J. S. Y., and T. N. Narasimhan, 1985. Hydrologic Mechanisms Governing Fluid Flow in Partially Saturated, Fractured Porous Tuff at Yucca Mountain, SAND84-7202, Sandia National Laboratories, Albuquerque, N. Mex.
- Weeks, E. P., and W. E. Wilson, 1984. Preliminary Evaluation of Hydrologic Properties of Cores of Unsaturated Tuff, Test Well USW H-1, Yucca Mountain, Nevada, USGS-WRI-84-4193, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.

- White, A. F., H. C. Claassen, and L. V. Benson, 1980. The Effect of Dissolution of Volcanic Glass on the Water Chemistry in a Tuffaceous Aquifer, Rainier Mesa, Nevada, USGS-WSP-1535-Q, Water-Supply Paper, U.S. Geological Survey, Washington, D.C.
- Whitfield, M. S., 1985. "Vacuum Drilling of Unsaturated Tuffs at a Potential Radioactive-Waste Repository, Yucca Mountain, Nevada," Characterization and Monitoring of the Vadose Zone, National Water Well Association Symposium, Denver, Colorado, November 19-21, 1985.
- Wilson, C. N., and V. M. Oversby, 1984. Spent Fuel Cladding Containment Credit Tests, preprint, UCRL-89869, Lawrence Livermore National Laboratory, Livermore, Calif.
- Wilson, W. W., 1985. Letter from W. W. Wilson (USGS) to D. L. Vieth (DOE/NVO), December 24, 1985; regarding unsaturated zone flux.
- Wilson, C. N., and V. M. Oversby, 1985. Radionuclide Release from PWR Fuels in a Reference Tuff Repository Groundwater, UCRL-91464, (preprint), Lawrence Livermore National Laboratory, Livermore, Calif.
- Winograd, I. J., and G. C. Doty, 1980. Paleohydrology of the Southern Great Basin, with Special Reference to Water Table Fluctuations Beneath the Nevada Test Site During the Late(?) Pleistocene, USGS-OFR-80-569, Open-File Report, U.S. Geological Survey, Reston, Va.
- Winograd, I. J., and W. Thordarson, 1975. Hydrogeologic and Hydrochemical Framework, South-Central Great Basin, Nevada-California, with Special Reference to the Nevada Test Site, U.S. Geological Survey Professional Paper 712-C, Washington, D.C.
- Winograd, I. J., B. J. Szabo, T. B. Coplen, A. C. Riggs, and P. T. Kolesar, 1985. "Two-Million-Year Record of Deuterium Depletion in Great Basin Ground Waters," Science, Vol. 227, pp. 519-522.
- Zimmerman, R. M., 1983. "First Phase of Small Diameter Heater Experiments in Tuff," in Proceedings of the 24th U.S. Symposium on Rock Mechanics, June 1983, pp. 271-282.

CODES AND REGULATIONS

- 10 CFR Part 60 (Code of Federal Regulations), 1983. Title 10, "Energy," Part 60, "Disposal of High-Level Radioactive Wastes in Geologic Repositories," U.S. Government Printing Office, Washington, D.C.
- 10 CFR Part 960 (Code of Federal Regulations), 1984. Title 10, "Energy," Part 960, "General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories; Final Siting Guidelines," 49 FR 47714, Vol. 49, No. 236, December 6, 1984, pp. 47714-47769.
- 40 CFR Part 191 (Code of Federal Regulations), 1985. Title 40, "Protection of Environment," Part 191, "Environmental Standards for the Management and Disposal of Spent or Nuclear Fuel, High-Level and Transuranic Radioactive Wastes: Final Rule," Federal Register Vol. 50, No. 182, September 19, 1985.

C.6 PRECLOSURE RADIOLOGICAL SAFETY

This section addresses comments on the behavior and effects of radionuclide releases during repository operations. It corresponds to the system guideline on preclosure radiological safety and includes all guideline evaluations that support the system guideline. In this respect, comments on preclosure radiological safety also address the ability of the repository system to meet the requirements of the applicable Nuclear Regulatory Commission and U.S. Environmental Protection Agency regulations (10 CFR Part 20, 10 CFR Part 60, and 40 CFR Part 191, Subpart A).

C.6.1 POPULATION DENSITY AND DISTRIBUTION

The U.S. Department of Energy (DOE) received six comments on its evaluation of the proposed Yucca Mountain site against the population density and distribution guideline (10 CFR 960.5-2-1). These have been categorized into the following issues: (1) Population Density, (2) Transportation-Related Accidents, and (3) Emergency Preparedness Plan.

Issue: Population density

One commenter contended that the population density and distribution guideline demonstrates that Nevada's low population size and density will translate into Nevada's population being "sacrificed" because other more populous states have more political clout, while another asked that the population density of Clark County be considered in impact evaluations and calculations.

Response

The DOE siting guidelines contained in 10 CFR Part 960 govern the DOE site-evaluation process. These siting guidelines establish performance objectives for a geological repository system, define the basic technical requirements that candidate sites must meet, and specify how the DOE will implement its site-selection process. They do not give consideration to a State's "political clout." The objective of the population density and distribution guideline is to ensure the selection of a repository site that will minimize risk to the public and permit compliance with the U.S. Environmental Protection Agency and Nuclear Regulatory Commission (NRC) regulations. This is achieved in part by ensuring that the site is not located in a highly populated area. The disqualifying condition follows the language of Section 112(a) of the Nuclear Waste Policy Act (NWPA, 1983) by disqualifying any site where the surface facility would be located (1) in a highly populated area, or (2) adjacent to a 1-mile-by-1-mile area having a population of not less than 1,000 individuals (NWPA, 1983). Lastly, the population density of Clark County was considered in Section 6.2.1.2.3 of the draft Environmental Assessment (EA).

Issue: Transportation-related accidents

One commenter stated that the DOE finding that the favorable conditions under the population density and distribution guideline are present ignores potential situations such as transportation-related impacts of an accident and subsequent release of radioactive material in the Las Vegas metropolitan area.

Response

The criteria for the two favorable conditions under the population density and distribution guideline are that there be a low population density in the general region of the site and that the site be remote from highly populated areas. Neither of these criteria requires an analysis of potential accidental releases of radioactive materials in the Las Vegas metropolitan area. Therefore consideration of these potential releases is not relevant to evaluation of the favorable conditions under the population density and distribution guidelines. Nevertheless, Section 5.3.2 of the final EA has been revised to include an assessment of national and regional risk due to transportation of high-level radioactive waste.

Issue: Emergency preparedness plan

Two commenters requested more information about the preparation of an emergency preparedness plan for the Yucca Mountain repository site; one commenter stated that, "... without adequate substantiation, it is difficult to see how the DOE can conclude that the site is not disqualified under Condition 3." Another commenter stated that very little is said in the EA about who would respond in an emergency and if the Federal Emergency Management Agency (FEMA) would be establishing an office in Nevada.

Response

The DOE guidelines (10 CFR 960.5-2-1(d)(3)) state that a site shall be disqualified if, "... the DOE could not develop an emergency preparedness program which meets the requirements specified in DOE Order 5500.3 ... and related guides, or, when issued by the NRC in 10 CFR Part 60, Subpart I, 'Emergency Planning Criteria'." As noted in Section 6.2.1.2.5 of the draft EA, an emergency preparedness plan has already been produced by the DOE in cooperation with the State of Nevada (State of Nevada, Department of Human Resources, 1983). This plan will constitute a starting point for preparation of a more detailed, site-specific plan during the Environmental Impact Statement process. Given that the DOE has the ability to prepare such plans and that a basis for the required plan exists, it is difficult to see how the disqualifying condition could be present. Further information on the current emergency preparedness plan may be obtained from the reference.

The DOE Nevada Operations Office radiological assistance response team is of an excellent caliber and has a capability to respond to most identifiable radiological emergencies. Since this team is on constant alert, response plans do not rely on the participation of FEMA.

C.6.2 SITE OWNERSHIP AND CONTROL

Four comments were allocated to this preclosure category. The subject of preclosure site ownership and control addresses those aspects of owning and controlling the necessary surface and subsurface areas during site characterization, construction, and operation phases of a repository. These comments are divided into three issues: (1) Land Withdrawal, (2) DOE Findings Qualifications, and (3) Public Access.

Issue: Land withdrawal

Most of the comments received questioned the 50,000-acre land withdrawal requirement from the Bureau of Land Management (BLM) portion of the site. This number was quoted in numerous places in the draft Environmental Assessment (EA).

Response

The 50,000-acre requirement was an error in the draft EA. The actual acreage of land to be withdrawn from the BLM portions is approximately 5,000. The number in error has been corrected in the applicable sections of the final EA.

Issue: DOE findings qualifications

Comments were received that stated that the U.S. Department of Energy (DOE) had qualified its findings that the site does not meet the favorable condition of present control of surface and subsurface rights. The same was stated to be true for taking the potentially adverse condition relative to future conflicts over obtaining jurisdiction. The qualifications were, that since the DOE controls remaining portions of the site, it is expected that they can acquire jurisdiction and control over the remaining lands and that in the view of absence of conflicts, no impediments are projected.

Response

The real concern comes in the conclusion addressing whether the site meets the favorable and potentially adverse conditions. The site, as is stated in the EA, does not meet the favorable condition and accepts the potentially adverse condition. Any qualifying statements in the EA have no bearing on the ranking of a site with respect to favorable and potentially adverse conditions.

Issue; Public access

One commenter asked when a Federal Land Policy Management Act land withdrawal would be initiated and what measures would be taken to restrict public access during site characterization.

Response

A Federal land withdrawal action would not be initiated until and unless Yucca Mountain is selected as the first geologic repository. The DOE currently expects to start withdrawal at the time of construction license

application. With regard to restricted public access during site characterization, it should be noted that there is no requirement to take such measures at that stage, although protecting the integrity of the site certainly is an important consideration. In that regard, the portion not under control of the BLM is already within the boundaries of restricted-access Federal installations. The BLM portion that abuts those installations does not normally present public intrusion problems and primarily for that reason, no extraordinary measures were seen as necessary. However, should such problems arise, the DOE would consider seeking withdrawal (for a brief period corresponding to that necessary for characterization) of the otherwise unprotected BLM portion.

C.6.3 METEOROLOGY

This category concerns the data on existing meteorological conditions presented in Chapter 3. Two commenters expressed concern about correlating expected site meteorological conditions with those recorded at nearby monitoring sites, and about the possibility that the Environmental Assessment (EA) did not sufficiently address the potential for extreme weather phenomena. Another commenter identified a typographical error within the text.

Response

Although the data used in the draft EA are not site specific, reasonable generalities can be derived from those data. Because there is a noticeable paucity of such data for the Yucca Mountain site, a comprehensive site-monitoring program has been proposed that will provide the information needed to reassess this particular guideline if the Yucca Mountain site is recommended for site characterization. The frequency, intensity, and occurrence of extreme weather phenomena, as well as data on average or normal conditions, would become available if site characterization activities are implemented at Yucca Mountain.

All typographical errors within the text in question have been corrected in the final EA as suggested.

C.6.4 OFFSITE INSTALLATIONS AND OPERATIONS

This category addresses comments and questions concerning the potential impact that activities, primarily military operations including nuclear-weapons testing, tactical fighter training, and development of new defense systems, might have on a repository located at Yucca Mountain. Because of the large number of comments received in this category and the varied aspects associated with this subject, the comments have been divided into the following issues: (1) Proximity of Nuclear-weapons Testing to the Proposed Repository Site, (2) Increased Frequency of Nuclear-weapons Testing, (3) Effects of Higher Weapon Yields, (4) Release of Tectonic Strain Energy, (5) Defense-Related Development, (6) Military Operations, (7) Rail-spur Activities, and (8) Miscellaneous.

Issue: Proximity of nuclear-weapons testing to the proposed repository site

Twelve commenters expressed concern that the areas for nuclear-weapons testing were too close to Yucca Mountain and that future weapons testing could be closer. A view was expressed that the proximity of testing activities was a sufficient enough threat to a repository to reject the Yucca Mountain site. Another view was expressed that weapons testing should be sufficiently controlled so that it could not get too close to Yucca Mountain. Five commenters were concerned that the collapse of the cavity produced by the detonation at Rainier Mesa was representative of the situation at Yucca Mountain, and that the testing of nuclear weapons close to the proposed site could result in a similar incident if the repository were built at Yucca Mountain. They also questioned the effect of weapons test-induced ground motion on the underground structures proposed for the repository.

Response

The locations where nuclear weapons tests can be conducted on the Nevada Test Site (NTS) are well defined and closely controlled (see Figure 6-1 in the Environmental Assessment). The areas where current and future weapons tests can be conducted have been specified and they include Pahute Mesa, Rainier Mesa, Yucca Flat, the Buckboard area, and Mid Valley. The shortest distance from any of these areas to Yucca Mountain is 23 kilometers (14 miles). Requirements for containment of radioactive material, during and after a nuclear explosion, places constraints on the geologic characteristics of potential testing areas. Locations of testing areas and yield of weapons tests are strictly controlled.

Experience with underground structures at the NTS over a 25-year period demonstrates that ground motion resulting from weapons tests generally has little impact on underground structures except those very close to ground zero. Testing closest to Yucca Mountain could be in the Buckboard area and Mid Valley locations. The distance of 23 kilometers (14 miles), between these areas and the proposed repository underground facility is significantly greater than the 3-kilometer (2-mile) distance between Pahute Mesa (where the highest yield nuclear weapons are detonated) and Rainier Mesa (where three separate tunnel complexes in tuff are located), or the 3-kilometer (2-mile) distance between Yucca Flat and the location of the Climax Spent Fuel Test Facility (a facility in granite designed to simulate a repository). Over the testing history at Pahute Mesa, there is no evidence that tunnels in Rainier Mesa have been damaged or affected by nuclear detonations at Pahute Mesa. Since April of 1980, when construction of the Climax Spent Fuel Test Facility was completed, 90 announced tests have been conducted with one test being within 5 kilometers (3 miles). There has been no evidence of any damage or other impact to this facility as a result of nuclear-weapons testing. Based on this and other experience at the NTS, there is no physical evidence to indicate that a repository at Yucca Mountain would be affected by nuclear-weapons testing and its concomitant ground motion on the NTS.

There is confusion over the comparison of the Rainier Mesa collapse and the potential impact of nuclear-weapons testing on underground structures at some distance from the point where the weapon is detonated. When nuclear devices are detonated at Rainier Mesa, the explosive force released produces

a large spherical cavity the diameter of which is about one-third to one-half the length of a football field. In the case of the Rainier Mesa collapse, the overlying rock that collapsed into this cavity was already weakened by the presence of fractures resulting from previous weapons testing that had taken place in the subsurface tunnel complex.

The situation at Yucca Mountain is very different. There have been no nuclear weapons tested in this area and none will be conducted closer than 23 kilometers (14 miles) in the future. The conditions associated with the Rainier Mesa collapse bear no similarity to the physical situation in a repository.

Issue: Increased frequency of nuclear-weapons testing

Seven commenters were concerned that the increased frequency of nuclear-weapons testing could physically affect the repository in such a way as to cause loss of isolation capability and containment.

Response

As explained in the above response, experience with tunnels at Rainier Mesa, in close proximity to the weapons testing at Pahute Mesa and Yucca Flat, has indicated that weapons testing has not had any impact on the tunnels. Over this period, the frequency with which testing has occurred has varied widely. There is no evidence that frequency of testing has any effect on the tunnels, the geologic materials, or the hydrologic environment in which they are located.

The physical effect of ground motion from weapons testing is a well-understood physical phenomenon. Since 1960 many announced underground tests have been detonated in Pahute Mesa and in Yucca Flat. Observations in the tunnels at Rainier Mesa and in the Climax Spent Fuel Test Facility have shown that no damage has occurred as a result of testing of nuclear weapons. In addition, the hydrologic conditions on Pahute Mesa and Yucca Flat have been measured within 24 kilometers (15 miles) of the point of weapons testing, and these observations have shown no permanent and significant change in the hydrologic characteristics of the area as a result of the testing.

Issue: Effects of higher weapon yields

Three commenters were concerned that the ground motion associated with tests of higher weapon yields would affect the repository. The commenters noted that weapons with yields up to 8 megatons would be tested, and therefore some seismic testing should be initiated at the site.

Response

The ground motion at a repository site resulting from weapons testing is an effect that has been studied for several years. Vortman (1980) estimated the ground motion at Yucca Mountain as a function of size of the explosion for weapons detonated at Pahute Mesa and Yucca Flat.

Limits have been established for the maximum yield of nuclear explosions at Pahute Mesa and Yucca Flat; these are 1,000 kilotons and 250 kilotons, respectively. These limits are based on the natural geologic conditions in the test areas and on offsite damage potential. In addition, the Threshold Test Ban Treaty limits the maximum yield for any test to 150 kilotons. It is clear that tests up to 8 megatons are not realistic and it is highly probable that tests greater than 150 kilotons will not be conducted.

Within the maximum limits on testing at Pahute Mesa and Yucca Flat, the magnitude of the ground motion previously experienced or projected, at the Yucca Mountain site, does not indicate that there is a potential for damage to either the underground repository facility or the surface structures.

Issue: Release of tectonic strain energy

Four commenters were concerned that ground motion, caused by detonation of nuclear weapons at the NTS or from naturally occurring earthquakes, could result in new faulting or fault movement at Yucca Mountain.

Response

The U.S. Department of Energy (DOE) has considered the potential for faulting or fault movement at Yucca Mountain as a result of weapons testing. Movement occurred along Yucca Fault as a result of a nuclear explosion in Yucca Flat. The maximum yield of a weapon tested at Yucca Flat is limited to 250 kilotons. The distance from the weapon detonation point to the most distant point where fault movement has been detected is 14 kilometers (9 miles). While the yield limit for a weapon tested in the Buckboard area is 700 kilotons, the Threshold Test Ban Treaty limit is 150 kilotons. It is not expected that tests of a greater yield than that allowed by this treaty will be conducted. Because the Buckboard area is 23 kilometers (14 miles) from Yucca Mountain, nearly twice the distance of recorded weapons-induced fault movements, there is no evidence to indicate that faulting or fault movement is likely to result at Yucca Mountain from nuclear explosions at any of the present or proposed test areas.

There is no evidence to indicate that nuclear weapons detonated at NTS would cause movement on faults at Yucca Mountain. Section 6.2.1.5.5 of the final Environmental Assessment (EA) contains a discussion of the size and distance relationships for underground tests and the repository.

Issue: Defense-related development

Two commenters asked how the repository program will be coordinated with nuclear-weapons testing programs. In particular, one commenter asked how repository operations will affect those of the NTS; that is, whether the NTS will have to alter its testing schedule due to the repository schedule of operations. Another asked whether additional land withdrawal will be required to effect this coordination. A last commenter asked about the potential for and effects of a stray direct hit by military ordnance on the repository site (effects of repository operations on nearby military operations are dealt with under "Military operations").

Response

The potential conflict between the nuclear-weapons testing program and the repository program was resolved in 1978. The management responsible for the testing of nuclear weapons indicated that a repository located in the Nevada Research and Development Area (NRDA) (known also as Area 25) would not have any impact on the weapons testing programs. Consequently, there is no compelling reason for the repository program to be coordinated with the weapons program beyond that necessary to assure worker safety underground during a nuclear explosion. In order to reinforce this position, a 635-square-kilometer (245-square-mile) area adjacent to Yucca Mountain was set aside for nonnuclear-weapons development activities. No additional land withdrawal will be required to effect coordination with the weapons testing program.

At the present time, deployment of small intercontinental ballistic missiles is being considered in the vicinity of Yucca Mountain. It is the policy of the DOE that the commitment to Yucca Mountain as a repository site, if it is recommended, will hold precedence over other activities in the area. If a new activity proposed for the NRDA is not compatible with the repository, it will not be undertaken. The DOE would not recommend a site to the Nuclear Regulatory Commission (NRC) for licensing if there were obvious conflicts that would jeopardize the ability to obtain a license.

Lastly, the potential for a direct hit on surface facilities with a bomb or other military ordnance is highly unlikely. The airspace over the surface facilities is controlled by the DOE, which would not clear a flight over the facility if there was a credible possibility for such an occurrence.

Issue: Military operations

All seven commenters in this area questioned the effects that repository operations would have on military operations, particularly in regard to the air traffic corridors used by military jets in this locale. One commenter questioned the potential for the use of the U.S. Air Force (USAF) radiological assistance team. The effects of sonic booms on repository buildings and their potential to induce earthquakes were also questioned, particularly in regard to sonic coupling.

Response

The DOE is knowledgeable of the present-day aircraft flight requirements of military operations conducted at the Nellis Air Force Bombing Range. The DOE, through past negotiations with the USAF, established the existing operational restrictions for flights through DOE-controlled air space over the NTS (designated R4808W and R4808E). Currently R4808E is generally closed to all military aircraft while R4808W is open to military aircraft only upon request.

The DOE recognizes that the possibility of a USAF aircraft crash or bombing accident, although considered highly unlikely due to the overflight restrictions, has not been completely resolved in the draft EA or in Jackson et al. (1984). Limitations on obtaining and disseminating information about such a scenario must be recognized. The DOE is interacting with the USAF to

address and resolve this concern. A detailed plan for studies during site characterization for an acceptability assessment is being developed. If evaluation of the current situation results in a potential risk that could result in a mission conflict, the DOE is considering several alternatives and mitigation measures to reduce the event probability or consequences so that acceptable risks are realized. These alternatives include:

1. Site hardening and/or expansion of hardened facilities.
2. Relocating the USAF flight corridor.
3. Relocating the repository surface facilities.

If the analysis indicates that alternatives or mitigation measures are required, the detailed plan being developed with the USAF calls for study of the feasibility and the costs and benefits of each scenario, followed by development and implementation of a scenario-selection process.

The DOE Nevada Operations Office (NVO) maintains an excellent radiological assistance team. Therefore, the USAF radiation assistance team would not be called upon for any foreseeable emergency. In the past, the NVO has requested transportation assistance for technical staff. This type of assistance may be required if a large technical team such as the radiological assistance team needed to be transported to a site very quickly.

With respect to sonic effects, the manmade forces that are capable of producing ground motion of significant magnitude are well understood. While sonic booms produce a noise that impacts man in many ways and jars surface structures, the energy transferred to the earth is not very large. The DOE is not aware of any reports of damage to structures as a result of the shock wave produced by planes flying faster than the speed of sound. The total energy in the shock wave of a sonic boom is not great. The earth is readily capable of absorbing that energy within the first 30 meters (100 feet). Because earthquakes generally occur several kilometers below the surface, it is unlikely that an earthquake could be triggered by sonic booms. To date the DOE is not aware of any documented instance where sonic booms have triggered an earthquake.

Because a waste package at Yucca Mountain would be at least 230 meters (754 feet) below the surface, it does not appear reasonable, based on the understanding of the physical phenomena, that a resonant coupling could lead to effects upon a repository at that depth.

Issue: Rail-spur activities

Two commenters questioned the location of the proposed rail spur and expressed the view that it should be moved south of U.S. Highway 95, because, as proposed, it would run very close to several range areas which are used for live weapons delivery and other critical USAF flight training exercises.

Response

Final location of the rail spur will be considered as the site evaluation process continues. The proposed rail route to the repository runs adjacent to the boundaries of Range 63 OT&E Test area, TACS Area, Silver Flag Alpha Range, and Range 64/65 Tactical Training Ranges. It is now recognized,

on the basis of recent communications with the USAF, that aircraft could fly at low altitudes above trains transporting casks of waste to the repository. The policy of the DOE is not to restrict USAF training operations as a result of trains moving along the boundaries of the ranges. The DOE is interacting with the USAF to address and resolve this concern. A detailed plan for an alternative assessment is being developed.

Alternatives which will be evaluated can be classified into two regimes: spatial and temporal. The spatial alternatives will seek to identify and evaluate alternate routes while the temporal alternatives will seek to determine if scheduling of DOE and USAF activities can be accomplished without impacting USAF missions. All alternatives will be evaluated in terms of feasibility, cost, and benefits. Following such an evaluation, a method for selecting among alternatives will be developed and implemented, as called for in the detailed plan noted above.

Issue: Miscellaneous

Seven miscellaneous comments were received which addressed random items associated with offsite installations and operations. One commenter asked who will provide security for the repository, and whether the USAF would be asked to help in this task. In a related comment, it was suggested that site characterization and security activities be implemented with the understanding that live ordnance may be present throughout the site.

Secondly, two commenters asked what the effect of radioactive releases from current testing on the site would be, in regard to ground-water contamination and surface-level radioactivity.

Another commenter asked where shipments of radioactive waste will be kept in the event of an interruption in shipments.

One commenter noted that the EA text, in reference to the presence of other nuclear installations and operations, states that the pertinent regulations (40 CFR Parts 190 and 191) do not apply to nuclear-weapons testing at the NTS. It was asked that the EA further detail why such a situation exists.

One commenter simply stated that there is a low level radioactive waste facility near Beatty, Nevada and that the site was poorly maintained.

Response

With regard to security, the DOE will arrange for security services from a private contractor, and the USAF will not be involved. Standard construction and security operating procedures will be implemented to check for live ordnance prior to initiation of all activities in new areas (i.e., areas previously unused).

With respect to radioactive releases, any water that reaches the waste disposal container will come from the surface of Yucca Mountain. Very low atmospheric fallout is present all over the world; no more radioactivity is likely to be contained in this water than in domestic water supplies. Regulations for the containment of radiation from underground nuclear

explosions are very stringent (ERDA, 1977). Data for airborne radionuclides from the NTS, detected offsite from 1974 through 1983, can be found in Table 6-7 of the EA. This table shows that for four of the last five 1-year monitoring periods, no detectable radioactivity from nuclear explosions was observed outside the NTS boundaries.

The repository will be designed to accept and store wastes equivalent to 3 months of deliveries, so interruptions in repository operations would not interfere with waste receipt. It should be noted that the table in the draft EA that prompted this comment (Table 6-6, Summary of analyses for Section 6.2.1.5 ...) states that repository operations would be interrupted during weapons testing. However, the interruption referred to is due to the fact that workers would be removed from the underground workings for safety reasons, which would not necessarily interrupt waste receipt.

Nuclear-weapons testing, as a defense-related application of atomic energy, is not subject to regulation by the Environmental Protection Agency (which promulgated 40 CFR Parts 190 and 191). Rather, pursuant to the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and the DOE Organization Act of 1977, as amended; such activities are under the purview of the DOE.

The comment regarding the low-level radioactive waste facility in Beatty, Nevada is noted. The facility is operated by U.S. Ecology.

C.6.5 SYSTEM GUIDELINE - PRECLOSURE RADIOLOGICAL SAFETY

The preclosure radiological safety guideline addresses concerns for protecting both the public and repository workers from accidental or operational radiological exposure. The 29 comments received in this category have been categorized into the following issues: (1) Accidental Radiological Releases, (2) Non-accidental Radiological Releases, and (3) Miscellaneous.

Issue: Accidental radiological releases

Eight comments have been categorized in regard to this issue. Accidental releases consist of those releases that occur from events other than the everyday operational releases that may occur. Four topics are addressed: accidental release scenario, breached waste disposal container scenario, aircraft impact scenario, and emergency preparedness.

Accidental release scenario. Some commenters stated that the references cited in the Environmental Assessment (EA) for accidental radiological release scenarios have changed and that those changes should be reflected in the EA. In addition, it was stated that releases under elevated temperatures should be discussed.

Response. The preliminary safety analysis has not been revised to reflect the two-stage repository concept described in Section 5.1 of the EA. Development of the two-stage concept occurred concurrent with the preparation of the EA, therefore the safety analysis could not be revised in the time available. The phased increase in the waste-receiving rate associated with

the two-stage concept will not necessarily involve an increase over the radiological impacts presented in EA Section 5.2.9, because the maximum waste-receiving rate in the two-stage concept is not greater than the rate upon which the information in Section 5.2.9 is based. The waste-storage capacity on the surface in the two-stage concept is, however, greater than the capacity upon which the information in Section 5.2.9 is based. Therefore, there is a potential for increase in the radiological impact estimates. Numerous design options in storage configuration, structure hardening, and other aspects of the design can be selected to limit this potential increase to insignificant levels, such that the preliminary safety analysis results can still be regarded as representative of the preclosure radiological safety of a repository at Yucca Mountain. These impacts will be further assessed during the license application design process to provide the necessary information for the Environmental Impact Statement and Safety Analysis Report, as well as to support optimization of the design for as low as reasonably achievable radiation exposures and for accident prevention and mitigation. Because many nuclear facilities with comparable amounts of radioactive material in use, or in storage on the surface, exist in areas of greater population density than that of the potential Yucca Mountain repository, there is high confidence that the radiological impacts of a two-stage repository, with up to 750 metric tons of uranium waste stored on the surface, will be well below acceptable limits. Therefore, the conclusion in Section 6.2.2.1.4 on the preclosure radiological safety system guideline is still, "The evidence does not support a finding that the site is not likely to meet the qualifying condition for this preclosure system guideline (level 3)."

With respect to radionuclide releases under elevated temperatures, the spent fuel from which the gaseous emissions originate are themselves under high temperatures. Additionally, accidents, such as fires, and the resultant doses are addressed in Section 5.2.9.2.3 of the EA.

Breached waste disposal container scenario. Some commenters stated that the accident scenario of having to retrieve breached waste disposal containers was not considered. It was stated that these operations could entail considerable dose commitments to workers.

Response. At this point in the Nevada Nuclear Waste Storage Investigations Project, the design is not sufficiently developed to reasonably, and in adequate detail, estimate the conditions that would be encountered during waste retrieval operations. The radiological impacts for normal and accident conditions during retrieval operations will be assessed during the advanced conceptual design and license application design in order to provide the necessary information for the Environmental Impact Statement and Safety Analysis Report, as well as to support optimization of the design for as low as reasonably achievable radiation exposures, and for accident prevention and mitigation.

Aircraft impact scenario. Some commenters addressed the need for substantiation of the conclusions reached regarding an aircraft impact at the site.

Response. The U.S. Department of Energy (DOE) recognizes that the probability of a U.S. Air Force (USAF) aircraft crash/bombing accident has

not been sufficiently substantiated in the draft EA or in Jackson et al. (1984). The DOE is interacting with the USAF to address and resolve this concern; a detailed plan for an event-frequency analysis of this scenario is currently being developed. If evaluation of the current situation results in unacceptable risk, the DOE is considering several alternatives and mitigation measures (some of which will require acceptance by the USAF) to reduce the event probability or consequences, which include the following:

1. Site hardening or expansion of hardened facilities.
2. Relocation of the USAF flight corridor.
3. Rerouting of the rail spur or highway to the repository.
4. Relocation of the repository surface facilities.
5. Assessment of the impacts of a monitored retrievable storage facility on transportation alternatives and the design of repository surface facilities.
6. Scheduling of DOE and USAF operations to be mutually exclusive.
7. Limiting of USAF operations (e.g., altitude, schedule, or activity limitations).

Because there are several ways to reduce the risk of this type of accident, there is high confidence that it can be prevented or adequately mitigated. Therefore, the conclusion in Section 6.2.2.1.4 on the preclosure radiological safety system guideline is still, "The evidence does not support a finding that the site is not likely to meet the qualifying condition for this preclosure system guideline (level 3)."

Emergency preparedness. One commenter questioned whether the DOE would temporarily discontinue repository operations if the combined totals of natural and manmade radiation (weapons testing) were found to be unsafe at Yucca Mountain. Two commenters stated that an emergency preparedness plan for the repository, such as the one that the State of Nevada has in effect, infers a level of confidence that may not be justifiable.

Response. A criticality could not occur with spent fuel, therefore a release of radioactivity would consist of a short-lived fission by-product which could easily be cleaned up. Natural radiation is always present in the atmosphere and is considered a baseline amount for assessing additional man-made releases. If atmospheric levels of radionuclides become unsafe to human life, from whatever source, operations can and will be discontinued until safe levels are achieved.

The DOE is confident that an emergency preparedness plan can be developed for Yucca Mountain if a repository is sited there. The plan would comprehensively establish procedures in the event of a radiological emergency.

Issue: Non-accidental radiological releases

Six commenters were concerned with radiological releases from the operational aspects of a repository. The topics addressed by this issue are: source terms, naturally occurring exposure, and radioactive-source testing.

Source terms. A few commenters suggested that source terms originating in the various cleaning, handling, packaging, and processing operations in

the various facilities be addressed. These concerns include assessments of exposures of workers and the public to various radioactive gases. It was stated that the acceptable radionuclide levels were not adequately presented. Another commenter stated that it is widely recognized that maximum permissible concentrations of radionuclides do not fully characterize the significance of releases.

Response. At this point, the design is not sufficiently developed to reasonably, and in adequate detail, estimate the source terms originating in the various operations conducted in the waste-handling and packaging facility. For example, if a monitored retrievable storage facility is used, waste processing and packaging may not occur at the repository. As stated in EA Section 5.2.9.2.2, the emissions and resulting impacts that occur during normal operations are insignificant because of the measures taken to protect workers and dilution over the transport distance to the environment. EA Section 6.4.1 provides some generic estimates of offsite releases from major sources. All source terms and the resulting radiological impacts will be assessed during the advanced conceptual design and license application design to provide the necessary information for the Environmental Impact Statement and Safety Analysis Report, as well as to support optimization of the design for as low as reasonably achievable radiation exposures (public and repository worker) and for accident prevention and mitigation. Because many nuclear facilities, with comparable amounts of radioactive material being handled in similar operations, exist in areas of greater population density than that of the potential Yucca Mountain repository, there is high confidence that the radiological impacts resulting from cleaning, handling, packaging, and processing operations will be well below acceptable limits. Therefore, the conclusion in Section 6.2.2.1.4 on the preclosure radiological safety system guideline is still, "The evidence does not support a finding that the site is not likely to meet the qualifying condition for this preclosure system guideline (level 3)."

The maximum permissible concentrations in question (Table 6-41 in draft EA Section 6.4.1) are in error by a factor of one million. These have been revised in the final EA (Table 6-46). A defined estimate of the collective dose for those emissions was not made, because the release levels of these nuclides and the remoteness of the site provide assurance that such dose levels would be very low.

Naturally occurring exposure. It was suggested that the EA discuss appropriate measures to limit exposure to naturally occurring radionuclides.

Response. The hazards encountered from naturally occurring radionuclides are recognized and are receiving attention. The forthcoming Site Characterization Plan and Exploratory Shaft Test Plan will describe the work that will be done to characterize the conditions of exposure to natural radioactivity, including such sources as penetrating radiation from the rock, as well as air and surface contamination that develop due to the emanation and subsequent decay of radon isotopes from the rock.

Radioactive-source testing. Concern was expressed in some comments about the plans to utilize radioactive-source materials for in situ testing and the risk factors associated with those tests.

Response. The use of radioisotopes for tracer studies and radioactive sources for well logging are discussed in Section 4.1.1.1. The radiotracers to be used have short half-lives (from several hours to tens of days) and thus will completely decay within a short period of time (from a few days to a few months, depending on the isotope). The well-logging sources are retrievable. This type of testing is commonly performed throughout the United States.

Issue: Miscellaneous

Fourteen comments have been classified into the miscellaneous issue. They consist of various editorial changes and two topics that do not fit into the previous issues: surface-water transport and ground-water release mechanisms.

Editorial changes. Several commenters stated that various parts of the radiological-safety discussions needed some editorial changes to better reflect a technical position. One commenter stated that on page 6-104 (Section 6.2.2.1.3) of the draft EA, the statement, "The arid conditions allow very limited infiltration and recharge ...", is not referenced to legitimate sources.

Response. In Section 6.4.1.2.2, "virtually all (99.9+ percent) ..." has been inserted to show that indeed the filter systems are not 100 percent efficient.

In Section 6.2.2.1.3, the reference to Table 6-45 (Preliminary estimates of cumulative radioactivity released to the accessible environment from a repository containing 70,000 MTHM) in the first sentence (paragraph six, in the draft EA) should have been a reference to Table 6-41 (Assessment of releases from normal preclosure operations). The table is correctly referenced in the final EA. The table lists the allowable limits for concentrations of airborne radionuclides. All of the limits listed in the table were in error and have been corrected.

In Section 6.2.2.1.3 of the draft EA, the last sentence of paragraph 5 beginning with "The air pathway ..." has been deleted because the discussion applies to saturated zone radionuclide migration. The air pathway from normal preclosure operations is discussed in Section 6.4.1.2.2. It is only significant when compared to water transport pathways. It is extremely unlikely that a fracture release scenario would result in offsite doses greater than those calculated in Section 6.4.1.2.2 for preclosure releases. Nevertheless, the significance of fractures as gaseous transport pathways will be studied extensively during site characterization. In Section 6.2.2.1.3, of the draft EA, the second to last sentence in paragraph 5 has been revised in order to make it more understandable.

In Section 6.2.2.1.3, the reference method for predicted krypton-85 release comes from Nuclear Regulatory Commission Regulatory Guide 1.25, (Safety Guide 25), "Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors" (NRC, 1972).

The comment regarding inappropriate use of references is correct; the reference should be to Montazer and Wilson (1984) and Wilson (1985) only. The final EA has been revised accordingly.

Surface-water transport. A few commenters stated that weather conditions, including rainfall and snowfall should be assessed relative to the likelihood of surface-water transport of radionuclides that may reach the ground surface.

Response. The average weather conditions at Yucca Mountain suggest that surface transport mechanisms are not a likely scenario. The precipitation data for Yucca Mountain will be tabulated and compared to regional estimates after more than one year of data are available. During performance assessment in support of licensing, various scenarios that include severe weather and accidental surface releases will be considered. Also, Table 5-24 (Preliminary population dose commitments from postulated accidents) of the final EA presents results of a postulated flood scenario.

Ground-water release mechanisms. Comments were received stating that sentences in Section 6.2.2.1.3, paragraph 5, of the draft EA were misleading and unsupported. The discussion relates to ground-water transport not being a reasonable release mechanism due to the long travel times and the potential for retardation in zeolitized zones.

Response. The Calico Hills tuff is zeolitized beneath the repository horizon, and at least some sizable portion of the radionuclide flowpath passes through this unit; therefore, retardation will occur. The nearest water wells are further than 20 kilometers (13 miles) from Yucca Mountain.

Major revisions to the geohydrology discussion (EA Section 6.3.1.1.5) provide justification for flux estimates used for travel-time calculations. The new travel-time model for the unsaturated zone explains ideas on fracture flow versus matrix flow as presently understood.

C.6.6 ASSESSMENT OF PRECLOSURE PERFORMANCE

The assessment of preclosure performance embodies radiological assessments including evaluations of potential radiological releases and doses, and comparison with the requirements of the applicable guidelines and regulations.

Three comments were received under this category. One commenter agreed that worker exposure to radon would be low, but felt that the exposures should be discussed in terms of the uranium miner of 4 working level months (WLM) per year. Another comment concerned the fact that there was an error of 1×10^6 in the maximum permissible concentrations (MPC) listed for Table 6-41 in the draft EA. Additionally, the commenter felt that the discussion relative to MPCs confuses two systems of evaluation (ICRP-30 and 10 CFR Part 20).

One commenter pointed out that a discussion in EA Section 6.4.1.2.3, regarding releases of radioactive gases, references additional discussions within that section but that the additional discussions do not appear.

Response

Since 4 WLM per year is roughly equal to a lung dose rate of 56 rems per year, worker exposure would be well within the occupational dose limit for miners. However, specific data needed to quantify miner doses are lacking at this time.

The MPC values in Table 6-41 of the draft EA were indeed in error by a factor of 1 million and have been corrected in the final EA. The ICRP-30 (1982) system values used are only for dose conversion and the results are not compared to the concentration limits in 10 CFR Part 20, Appendix B, Table II. The conversion factor used was in error and has been revised in the final EA.

The reference in EA Section 6.4.1.2.3, to additional discussions within that section, was a typographical error. The correct reference is to Section 6.4.1.2.2 and has been corrected in the final EA.

REFERENCES FOR CHAPTER C.6

- DOE (U.S. Department of Energy), 1981. "Reactor and Nonreactor Facility Emergency Planning, Preparedness and Response Program for Department of Energy Operations," DOE Order 5500.3, Washington, D.C.
- ERDA (U.S. Energy Research and Development Administration), 1977. Nevada Test Site, Nye County, Nevada, Final Environmental Impact Statement, ERDA-1551, Washington, D.C.
- ICRP (International Commission of Radiological Protection), 1982. Limits for Intake of Radionuclides by Workers, Annals of the ICRP, ICRP Publication 30 Pergamon Press, Oxford, England.
- Jackson, J. L., H. F. Gram, K. J. Hong, H. S. Ng, and A. M. Pendergrass, 1984. Preliminary Safety Assessment Study for the Conceptual Design of a Repository in Tuff at Yucca Mountain, SAND83-1504, Sandia National Laboratories, Albuquerque, N. Mex.
- Montazer, P., and W. E. Wilson, 1984. Conceptual Hydrologic Model of Flow in the Unsaturated Zone, Yucca Mountain, Nevada, USGS-WRI-84-4345, Water-Resources Investigations Report, U.S. Geological Survey, Lakewood, Colo.
- NRC (U.S. Nuclear Regulatory Commission), 1972. Assumptions Used for Evaluating the Potential Radiological Consequences of a Fuel Handling Accident in the Fuel Handling and Storage Facility for Boiling and Pressurized Water Reactors, NRC Regulatory Guide 1.25 (formerly Safety Guide 25), Washington, D.C.
- NWPA (Nuclear Waste Policy Act), 1983. "Nuclear Waste Policy Act of 1982," Public Law 97-425, 42 USC 10101-10226, Washington, D.C.
- State of Nevada, Department of Human Resources, 1983. Radiological Emergency Response Plan, Division of Health, Carson City.

Vortman, L. J., 1980. Prediction of Ground Motion from Underground Nuclear Weapons Tests as it Relates to Siting of a Nuclear Waste Storage Facility at NTS and Compatibility with the Weapons Test Program, SAND80-1020/1, Sandia National Laboratories, Albuquerque, N. Mex.

Wilson, C. N., 1985. Results from NNWSI Series 1 Spent Fuel Leach Test, HEDL-TME-84-30, Hanford Engineering Development Laboratory, Richland, Wash.

CODES AND REGULATIONS

10 CFR Part 20 (Code of Federal Regulations), 1984. Title 10, "Energy," Part 20, "Standards for Protection Against Radiation," U.S. Government Printing Office, Washington, D.C.

10 CFR Part 60 (Code of Federal Regulations), 1983. Title 10, "Energy," Part 60, "Disposal of High-Level Radioactive Wastes in Geologic Repositories," U.S. Government Printing Office, Washington, D.C.

10 CFR Part 960 (Code of Federal Regulations), 1984. Title 10, "Energy," Part 960, "General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories; Final Siting Guidelines," 49 FR 47714, Vol. 49, No. 236, December 6, 1984, pp. 47714-47769.

40 CFR Part 190 (Code of Federal Regulations), 1982. Title 40, "Protection of Environment," Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations," U.S. Government Printing Office, Washington, D.C.

40 CFR Part 191 (Code of Federal Regulations), 1985. Title 40, "Protection of Environment," Part 191, "Environmental Standards for the Management and Disposal of Spent or Nuclear Fuel, High-Level and Transuranic Radioactive Wastes: Final Rule," Federal Register Vol. 50, No. 182, September 19, 1985.

42 USC (United States Code), 1974. "Energy Reorganization Act of 1974," Public Law 93-438, H.R. 11510, 88 Stat. 1233, Sections 202 (3) and 202 (4), Washington, D.C.

42 USC 2012 et seq. (United States Code), "Atomic Energy Act of 1954," Public Law 85-256, Washington, D.C.

42 USC 7101 (United States Code), 1977. "Department of Energy Organization Act," Public Law 95-91, 91 Stat. 565.

43 USC (United States Code), "Federal Land Policy and Management Act," Public Law 97-579, Washington, D.C.

C.7 ENVIRONMENT, SOCIOECONOMICS, AND TRANSPORTATION

This section addresses comments on (1) the environmental, socioeconomic, and transportation-related effects of repository development and site characterization; (2) the technical guidelines for socioeconomic, transportation, and the environment; and (3) the use of these guidelines in evaluating the relevant system guideline. Most comments in this category are concerned with the characteristics of the repository before it is closed and decommissioned. There are many parallels between this category and Section C.4, which includes comments on the data base, proposed activities, and repository design. Whereas Section C.4 discusses baseline conditions, Section C.7 discusses how site characterization or repository development changes those conditions. Most comments about the effects of the repository on the environment or communities near the repository are included in this category.

C.7.1 EXPECTED EFFECTS OF SITE CHARACTERIZATION

The comments that were received relating to effects of site characterization have been divided into two categories: (1) Effects on the Physical Environment and (2) Effects on Socioeconomic Conditions.

C.7.1.1 Effects on the physical environment

The comments in this issue address the expected effects on the physical environment from site characterization. The comments in this category have been divided into the following issues: (1) Ground-Water Contamination, (2) The Unsaturated Zone, (3) Air Quality, (4) Archaeology, (5) Effects on Mineral Resources, (6) Water Resources, (7) Land Use, and (8) Repository Expansion.

Issue: Ground-water contamination

The one comment received on this issue stated that water used during site characterization-related construction will compromise the results of geotechnical and hydrogeochemical testing.

Response

The concern is valid and care will be taken to avoid contaminating the in situ ground water being sampled. Potential seepage sources will be lined or located away from the shaft. Water added to control fugitive dust will be tagged with sodium bromide so that it can be traced or identified. In situ tests for hydrologic characterization will be positioned as far away as possible from the potential sources of fluids during drilling. In light of these precautions, it is not expected that construction water will compromise site characterization-related testing.

Issue: The unsaturated zone

Three commenters expressed concern regarding the effects of land disturbance on ground-water infiltration into the unsaturated zone. The draft Environmental Assessment (EA) states that 285 hectares (705 acres) of regolith would be disturbed, and these commenters stated that the potential for increased infiltration to the unsaturated zone should be evaluated. More information was requested on the effect of soil-surface disruption on the chemical composition of naturally percolating waters.

Response

The draft EA estimated the amount of land that would potentially be disturbed using assumptions that maximized the disturbed area. Borehole drilling will require that some new roads be constructed and will require use of several existing roads near the exploratory shaft site. It is expected that these roads will also be used to provide access to geophysical survey sites and that a minimal amount of additional land disturbance will result. Changes in infiltration rates caused by land disturbances during construction of roads and drill pads is expected to be minimal.

The great depth of the repository suggests that the composition of percolating waters will be unaffected by soil chemistry. Studies by Knauss et al. (1984) and Oversby and Knauss (1983) suggest that a sample taken 24 meters (78 feet) into an air-drilled hole did not contain soluble salts that could change the composition of percolating water. Further, these examples indicate that the presence of soluble salts is a surface-evaporation phenomenon and such materials are unlikely to be present at the depth of the repository. This topic will be further investigated by examining cuttings from drill holes in the unsaturated zone during site characterization.

Issue: Air quality

One commenter expressed concern that, depending on the mode of waste emplacement, the proposed action may exceed prevention of significant deterioration criteria. While the emission calculations for site characterization use a mid-value of fuel consumption, the extreme case would produce a high value of nitrogen oxides. The commenter makes a recommendation to use both values in calculations.

Response

If Yucca Mountain is selected for further development, detailed engineering information and emission calculations will be necessary to satisfy Nevada Department of Environmental Protection permitting requirements. The emission rates presented in Table 4-1 (Summary of nonfugitive atmospheric emissions from site characterization) of the draft EA are based on the horsepower rating of each stationary source combined with emission factors from AP-42 (EPA, 1977) in grams per horsepower-hour, not on the amount of diesel fuel consumed. The hours of operation for each piece of equipment are considered maximum estimates of projected use over the 23 to 26 months during which these activities would be taking place.

Issue: Archaeology

Five commenters addressed potential impacts to the prehistoric and historic sites identified in the draft EA, their significance with regard to Federal preservation efforts, and the need for protection or mitigation plans for identified sites. It was felt that the four prehistoric sites noted in the draft EA were not described in regard to their status with respect to the National Register, eligibility procedures and criteria, or how the opinion of significance was determined. In addition the U.S. Department of Energy (DOE) methods of prohibiting excavation or collection were questioned, particularly in light of similar unsuccessful efforts on the Nevada Test Site.

Response

Four sites were identified and are eligible for nomination to the National Register. Artifacts found at these sites were collected in consultation with the Nevada State Historic Preservation Officer (SHPO) to ensure that the information potential of these sites was preserved. A report is in preparation on these findings entitled, "Limited Test Excavations at Selected Archaeological Sites in the NNWSI Yucca Mountain Project Area, Southern Nye County, Nevada," Desert Research Institute Technical Report (Pippin, 1984).

Mitigation plans for adverse impacts will be developed with a Programmatic Memorandum of Agreement between the DOE, the Nevada SHPO, and the Advisory Council on Historic Preservation.

Issue: Effects on mineral resources

One comment was received concerning the lack of a discussion regarding the expected effects of site characterization on mineral resources and suggested that such a discussion be included in the final EA.

Response

To clarify the effects of site characterization on mineral resources, the following sentence has been added to Section 4.2.1.1.3 of the EA:

"A Class I resource survey (Bell and Larson, 1982) found no evidence of significant mineral or energy resources in the region surrounding Yucca Mountain, and therefore future exploration and development is not expected."

Issue: Water resources

Three commenters addressed the fact that a discussion of the effects of water use during site characterization was not provided, and that a more complete estimate of this usage should be provided. Similarly, it was felt that the final EA should include a discussion on potential impacts to local ground-water quality as a result of liquid effluent disposal.

Response

A preliminary estimate of water use for site characterization is less than 494,000 cubic meters (400 acre-feet) per year pumped from Well J-13. There are no nearby water users due to land-use restrictions around the site. Users that are within the same ground-water basin as the site are considered in draft EA sections 6.2.1.7.5 and 6.3.3.3.3. It is unlikely that a sewage lagoon will be used and that a septic tank and a drain field will be used instead. This system will be placed away from the shaft facility to minimize the chance for contamination of the testing facility area. The rock-storage pile will be lined with an impervious material to prevent infiltration. Discharge from the septic system would be sufficiently above the water table to ensure that there will be no impact to ground water.

Water use during site characterization has been reviewed in the final EA. The amount of water to be used during tests is expected to be limited in order to avoid potential interference with testing of moisture conditions at depth.

Issue: Land use

Three commenters expressed the opinion that the description of the uses of the public lands should be expanded. While land-use effects are not likely on federally controlled lands, the DOE should comply with pertinent State and local regulations governing land use and building construction. Lastly, the DOE should clearly indicate that the land to be used is in the public domain.

Response

Site characterization activities will comply with all applicable State and local regulations governing land use and construction activities. A description of the specific uses of the public lands is provided in Section 4.1 of the final EA.

Yucca Mountain is on land administered by the Federal Government. This is not to say that all of the land is restricted; part of the site is on public lands administered by the Bureau of Land Management.

Issue: Repository expansion

One commenter noted the lack of a description of potential impacts resulting from characterization of expansion areas, and suggested that such text be added to the final EA.

Response

There are no detailed plans to develop the expansion areas; therefore, potential environmental impacts cannot be adequately evaluated. The expansion areas, however, are within the site boundary shown in Figure 3-1 (Location of Yucca Mountain site in southern Nevada) of the draft EA.

C.7.1.2 Effects on socioeconomic conditions

The evaluation of potential socioeconomic effects of site characterization (including economic, demographic, community services, social, and fiscal and governmental effects) are covered by this category. Thirty-eight comments were received, and these have been grouped into the following issues: (1) Lincoln County, the State of Nevada, and Local Government; (2) Effects on State Tourism; (3) Site Characterization Impacts; (4) Disaggregate Community Services Impacts and Settlement Scenarios; (5) Work Force Estimate and Percent New Workers; (6) Sector-specific Comparison of Labor Demand; (7) Indirect Employment Multiplier; (8) Transportation Impacts; and (9) Miscellaneous.

Issue: Lincoln County, the State of Nevada, and local government

Three commenters felt that the Environmental Assessment (EA) should examine the socioeconomic effects of site characterization on Lincoln County and the State of Nevada as a whole. A fourth commenter perceived that no recognition is given in the Nuclear Waste Policy Act (NWPA) of 1982 to local government participation in planning or financial assistance during site characterization.

Response

The reasons why Lincoln County and the State of Nevada were, in general, not used as units of analysis were presented in Section C.4.1.5 of this Appendix. In addition, the U.S. Department of Energy (DOE) analysis of socioeconomic impacts of site characterization, as presented in Section 4.2.2 of the draft EA, led to the conclusion that the majority of the socioeconomic impacts of site characterization in the bicounty area would be small or insignificant. If these impacts are spread over a base of more than two counties, or the State as a whole, their relative magnitude would be even smaller.

The NWPA does recognize the participation of local governments in planning for the repository. Specifically, Section 117(c)(5) states that a consultation and cooperation agreement shall specify procedures, "... by which the Secretary shall assist such State, and the units of general local government in the vicinity of the repository site, in resolving the offsite concerns of such State and units of general local government..." (NWPA, 1983). Additionally, Section 116(c)(3) of the NWPA provides for grants equal to taxes to be made to units of general local government in which a site for a repository has been approved for site characterization.

Issue: Effects on State tourism

The DOE was asked to include an assessment of the potential for impacts that the decision to conduct site characterization could have on the Nevada tourism industry and the State's economic diversification program, and to lay the groundwork for continuing research to quantify such impacts as they occur. A second commenter noted that the term "tourism" seemed to be directed toward the hotel and gaming industries, and that this view should be

broadened to include the variety of recreational opportunities which draw visitors to southern Nevada.

Response

The suggested analysis of the effects of perception on tourism in southern Nevada is not included in Chapter 4 of the EA since the impacts of site characterization activities on all sectors of the bicoounty economy are expected to be insignificant. However, the DOE would monitor site characterization activities to validate the expected socioeconomic impacts of site characterization activities presented in Section 4.2.2 of the EA. As was discussed in Section C.4.1.5, the scope of the analysis in the EA is the bicoounty area; the State as a whole was not included in the definition of the affected area. If the Yucca Mountain site is approved for site characterization, a broader geographical area would be evaluated if appropriate, based on the Environmental Impact Statement (EIS) scoping process. Additional studies on both tourism, and attitudes and perceptions of locating a repository at Yucca Mountain would be conducted. The comment regarding a definition of the word "tourism" would be noted in future studies.

Issue: Site characterization impacts

Eight comments were assigned to this issue. Three commenters pointed out that in Chapter 4 of the draft EA, the DOE states that the social and economic impacts of site characterization are expected to be small and insignificant without describing the impacts. Five commenters stated that the bicoounty area (Clark and Nye) is an inappropriate unit of analysis of the socioeconomic impacts of site characterization, and suggested that these impacts should be analyzed at the county or community level.

One commenter questioned using the total baseline bicoounty employment as a basis for comparison with the expected number of new direct site characterization jobs, and suggested a comparison with baseline employment in the mining and construction sectors only. One commenter stated that the dependency factors applied in the draft EA need supporting documentation, since factors for offsite workers are likely to differ from those for onsite workers who are employed temporarily at a remote location.

Response

The socioeconomics section of the draft EA Chapter 4 does discuss several types of impacts which would result from site characterization activities. For example, Section 4.2.2.1.1 describes employment impacts, while Section 4.2.2.2 shows that the most likely impact on population would be an increase of about 830 new residents in southern Nevada. This section has been revised to show estimates of the distribution of the maximum population increase to communities nearest the Yucca Mountain site (Table 4-5 of the final EA). These community population estimates are small. Community services impacts are discussed in Section 4.2.2.3.

The appropriate unit of analysis of labor markets is the bicoounty area, or even a larger area. This is evident from the observation that workers currently employed at the Nevada Test Site (NTS), which is adjacent to the proposed Yucca Mountain repository site, come from many areas in addition to

Nye County. A comparison of the expected 109 new direct site characterization jobs (40 percent of the total new direct site characterization jobs) with the projected mining and construction employment in Nye and Clark counties (tables 3-12 and 3-13 of the final EA), indicates this number of jobs would be about one-half of one percent over the expected 1985 baseline employment in these two sectors.

Supporting documentation for dependency factors appears in U.S. Department of Energy, Environmental Aspects of Commercial Radioactive Waste Management, (DOE/ET-0029) Volume 3, Appendix C, Washington, D.C., 1979. These factors are also used in McBrien and Jones (1984). Use of a different, but reasonable, value for the dependent ratio assigned to the offsite direct work force would not significantly affect the results of the population impact analysis appearing in Section 4.2.2.2 of the draft and final EAs. For example, assume that the dependent ratio for all of the direct offsite workers were 2.47 instead of 1.28. The maximum site characterization related population would then be 2,229. This represents 0.4 percent of the estimated 1985 bicounty baseline population, which is not different than the percentage reported in the draft EA.

Issue: Disaggregate community services impacts and settlement scenarios

Seven commenters thought that a small change in population in some communities would have noticeable and perhaps significant community service, social, and fiscal impacts. One commenter expressed a belief that the discussion of the problems with Beatty water quality implies that "... because a problem exists, adding to it is acceptable ...". Five of these same commenters asked that a variety of settlement scenarios be examined and that the potential impacts upon community services, social conditions, and fiscal conditions resulting from each scenario be evaluated.

Response

If a significant number of the projected new residents were to settle in one of the smaller communities of Nye County during site characterization, noticeable impacts could indeed occur. Section 4.2.2.2 of the EA was revised to show the estimated distribution of maximum site characterization population (i.e., direct and indirect workers and their dependents) to individual communities in Nye and Clark counties nearest the Yucca Mountain site. If the settlement patterns described in Table 5-26 (Settlement patterns of Nevada Test Site employees) of the final EA apply, and the projected maximum site characterization related population increase is 2,080 persons (assuming all direct and indirect workers and their dependents are immigrants), then population increases ranging from 0.1 to 5.9 percent would result (Table 4-5 of the final EA). These percentage increases are not considered significant and, from the community services information presented in Chapter 3 of the EA, would not appear likely to overload community services providers. The small number of new residents is also unlikely to result in significant changes in social conditions. Finally, only minor changes in local government revenues and expenditures would result from such population increases.

Section 4.2.2.3 of the draft EA should not be interpreted to imply that "... because a problem exists, adding to it is acceptable ...". In the judgment of the DOE, the magnitude of the incremental impact of site

characterization on the Beatty water supply problem will be "very small." This judgment is reasonable, based on Table 4-5 of the final EA which shows that a maximum of two additional persons could be expected to settle in Beatty during site characterization. Furthermore, the Beatty Water and Sanitation District and the Nye County Commission, as mentioned in Section 3.6.3.3 of the draft EA, are taking positive action to alleviate the water quality problem. No judgment is made, however, about the acceptability of the impact to present or future residents.

The DOE believes that use of the recent settlement patterns of workers employed at the NTS provides a reasonable indication of the expected settlement patterns of site characterization workers. Development of alternative settlement patterns would have required considerably more information than was available during preparation of the EA, and would not likely have resulted in substantially different conclusions regarding the suitability of the site.

Issue: Work force estimate and percent new workers

Two commenters could find no reference to support the work force estimates given for site characterization, as presented in Table 4-3 (Peak regional employment effects of site characterization) of the draft EA. The commenters also noted that the EA does not substantiate the conclusion that 60 percent of the work force would be individuals currently employed by the DOE and 40 percent would be new workers.

Response

There are two sources for the employment estimates shown in Table 4-3 (Peak regional employment effects of site characterization). The direct employment estimates are based on the site characterization activities described in Section 4.1 of the EA. The indirect employment estimates were developed by applying an indirect employment multiplier of 1.54 to the direct employment estimates. Section 5.4.1.1 of the EA has been revised to discuss further the derivation of this multiplier.

Based on similarities between site characterization activities described in Section 4.1 and the construction and drilling activities currently carried out by the DOE and its contractors at the NTS, it was estimated that about 60 percent of the direct work force shown in Table 4-3 would already be employed in DOE activities. Both the work force estimates and the 60 percent assumption would be validated using data gathered by the site characterization socioeconomics monitoring program. Information on the percentage of current DOE workers was provided to give the reader a realistic understanding of the likely increase in the number of new DOE-related jobs that would be associated with site characterization.

Issue: Sector-specific comparison of labor demand

Two commenters felt it to be inappropriate to compare the Project-related demand for site characterization workers with total bicoounty employment. Instead, the comparison should be made with mining and construction work force estimates only.

Response

As seen in Table 4-3 (Peak number of site characterization workers), site characterization activities are expected to generate a total of 273 direct jobs. Baseline mining and construction employment in Clark and Nye counties in 1985 is projected to be 20,876 as shown in Table 3-12 (Employment in selected industries in Nye County, 1978-2000) and Table 3-13 (Employment in selected industries in Clark County, 1978-2000) of the final EA. Therefore, the project would increase employment in those sectors by no more than 1.3 percent. This sector-specific impact is probably overstated, because some of the 273 workers are in neither mining nor construction.

Issue: Indirect employment multiplier

The DOE received six comments which questioned the use of a multiplier of 1.54 indirect workers for each direct worker.

Response

Section 5.4.1.1 of the final EA was revised to discuss the derivation of the indirect employment multiplier. That discussion also appears in section C.7.4.2 of this document.

Issue: Transportation impacts

The DOE received five comments on the draft EA discussion of transportation impacts during site characterization. These comments concerned limitation of the discussion of highway impacts to U.S. Highway 95 and failure to discuss rail transportation impacts, potential damage to highways, and the hazards of transporting fuel and explosives.

Response

Because U.S. Highway 95 will be the main route for transportation of workers and materials to the Yucca Mountain site during site characterization, it was logical to focus the analysis upon that road. Rail transportation will not be used for workers and materials during site characterization. In addition, there will be no shipments which are unique from either a weight or content standpoint; consequently, no additional analyses were performed.

Issue: Miscellaneous

Two comments were considered under the miscellaneous issue; these concerned the request for additional information on site characterization, and clarification of the DOE policy regarding withholding of State funding.

Additional information. One commenter requested additional details on site characterization activities, including calendar time-phasing, costs associated with construction and testing, incomes earned by site characterization workers, housing accommodations and project-provided transportation for commuting direct workers, and the skill and wage mix of direct workers and likely union representation of direct workers.

Response. The site characterization phase, as defined in 10 CFR Part 960, begins after a site is recommended to, and approved by, the President. These decisions are expected to be completed sometime in 1986. The footnotes to Table 4-3 (Peak number of site characterization workers) in the final EA show the schedule for the 55 months of planned site characterization activities.

According to the June 1985 Mission Plan (DOE, 1985), the total cost of site investigations for the first repository is expected to be about \$767 million. The specific dollar allocations for each site are not explicitly known at this time due to the uncertainty as to which sites will be selected. Once three sites have been chosen for detailed studies, it is expected that the amount applied to the Yucca Mountain site would be approximately one-third of the total available funding.

The assumption of an average annual wage of \$36,200 for repository workers made in Chapter 5 of the EA would also apply to direct site characterization workers.

The results of the socioeconomic impact analysis are independent of the level of amenities provided for workers at the site. While more detailed information about the amenities that workers receive would give some insight into the quality of life of the workers, this information is not directly applicable to the analysis in the EA. However, such information could be incorporated into the socioeconomic monitoring program associated with site characterization activities.

Detailed information on the skill and wage mix of direct workers and likely union representation would not affect the results of the analysis and has therefore not been incorporated into the EA.

DOE funding. One commenter noted that the DOE policy has been to withhold State-requested funds for developing independent data on selected technical issues, and that this statement is inconsistent with the DOE actions at Yucca Mountain. In the view of the commenter, the EA should reflect the practiced DOE policy, or the DOE policy should conform to both the spirit and letter of the Nuclear Waste Policy Act (the Act) of 1982.

Response. The DOE acknowledges that just prior to the issuance for comment of the draft EA, the State of Nevada brought suit (State of Nevada v. Herrington) with respect to the DOE denial of Nevada's request under the Act to grant funding for the purpose of collecting certain independent, primary "site characterization data." However, a detailed discussion of that litigation or of the DOE grant policies in implementation of the Act is not considered appropriate to the context of the EA document.

C.7.2 ENVIRONMENTAL QUALITY

The twenty-nine comments received in this category concern eight issues that involve: (1) Water Resources, (2) Containment, (3) Nuclear Waste Heat Generation, (4) Recreation, (5) Water Rights, (6) Effects of Waste Retrieval,

(7) Effects on the Physical Environment, and (8) Application of Major Federal Environmental Laws.

Issue: Water resources

This issue concerns the problems of use and potential contamination of water resources, an important issue in the West. The repository will use locally available ground water. Commenters questioned the extent, quantity, and quality of the existing ground-water aquifer; the potential evapotranspiration rate; the amount of water to be used for repository activities; plans to conserve water; and the possible effects to the aquifer from use of the water; discharges from facilities; and the postulated release of radioactive materials into the ground water. One commenter pointed out that Devils Hole is a warm spring, not a hot spring. Fourteen comments were received on this issue.

Response

Water consumption at the repository will rise to a peak of over 120,000,000 gallons per year at the end of the sixth year and decrease to about 115,000,000 gallons per year and remain at this level for the next 26 years. The average demands for the following 23 years of operation will be approximately 2,500,000 gallons per year. The latter time period represents the minimum water requirements for the repository.

The water would be pumped by an onsite well from the Alkali Flat-Furnace Creek Ranch ground-water basin. The draft Environmental Assessment (EA) has been revised to include an estimate of public and commercial use of ground water from this basin.

The repository will be designed to conserve water and to prevent degradation of the underlying aquifer. A hypalon-lined evaporative pond will be used for mine waste water effluents and sewage systems will conform to the regulations of the State of Nevada Board of Health. Although the exploratory shaft facilities will have a septic system located off the Yucca Mountain fault block that allows infiltration, the repository will be designed so that there will be no ground-water infiltration.

A second comment, dealing with overall water use, stressed the importance of integrating water conservation and reuse into the repository design. Although conservation concerns will be considered in the design, preliminary estimates indicate that there will be an adequate supply of water available for repository operations independent of conservation strategies. The U.S. Department of Energy (DOE) will have to meet very strict Nuclear Regulatory Commission (NRC) and U.S. Environmental Protection Agency (EPA) release limits so that the public health and safety are protected for both the short- and long-term periods.

Devils Hole will not be affected because waters in the Devils Hole area are fed from the Ash Meadows ground-water basin (Waddell et al., 1984; Dudley and Larson, 1976; Waddell, 1982). The ground-water basin that is the source for the Ash Meadows springs is not the same as the one underlying Yucca Mountain. Further studies during site characterization are expected to confirm

these ground-water-flow patterns. The draft EA text in Section 6.2.1.6.5 has been changed to explain that Devils Hole is a warm spring, not a hot spring.

Repository water use will not impact the Las Vegas valley water shortages, although a small population increase in the valley resulting from an influx of repository workers would add a very small increment to the projected shortages in the mid-2000s. Potential impacts to existing water users in the area were evaluated in Section 6.2.1.7.5 of the final EA. In sections 5.2.2, 6.2.1.7.5, and 6.3.3.3.3, information on water use in the same ground-water basin is compared with repository water-use estimates. The reader was referred from Section 5.2.9.2.3 to sections 6.3.3.3 and 6.2.2.1.3 where it is indicated that there are no permanent surface-water impoundments in the area of the repository and that the underground repository is located in the unsaturated zone. Sections 6.3.2 and 6.4.2 discuss the potential for releases over a 500-year time frame. Accidental release of radionuclides into the ground-water system is very unlikely. The thick unsaturated zone contains very limited moisture, and without moisture, there is no transporting medium to carry the radionuclides down to the water table. There are also no surface impoundments in the area that could cause potential surface dispersion.

For the draft EA, potential evapotranspiration was estimated by an empirical method (the Thornthwaite method) reviewed in Rosenberg (1974). Potential evapotranspiration for Yucca Mountain has been estimated to be about 0.6 meters (2 feet) per year. Estimates in Craig and Robison (1984) suggest 1.1 to 1.5 meters (3.5 to 5 feet) of potential evapotranspiration. The U.S. Geological Survey, in comments to the draft EA, stated that potential evapotranspiration is between 1.8 and 2.4 meters (6 and 8 feet) per year. Either of these estimates is consistent with the estimates of precipitation that are 20 percent or less of annual potential evapotranspiration as reported at the end of Section 6.3.1.1.3 of the draft EA. These estimates are preliminary and speculative, and the final EA has been revised to reflect this uncertainty. The climatic regime will be studied in more detail during site characterization.

Issue: Containment

This issue concerns the potential long-term risk that contamination would occur should containment fail, the adequacy of the many investigations to minimize the uncertainties, and what the DOE actions would be if water contamination did occur. Six comments were received in these areas.

Response

The DOE will be required to meet the NRC and the EPA regulations and will be required to show compliance with the regulations during the licensing of a repository. Investigations during site characterization will provide the data that will be used during the licensing process. The findings from these investigations will be reported in several publicly reviewed documents during the Environmental Impact Statement and the NRC regulatory processes.

As explained in Chapter 5 of the EA, natural and engineered barriers will be used to prevent and retard radionuclide migration. A radiological

monitoring program will be implemented to monitor local and regional ground-water supplies. Should a problem be identified, an appropriate mitigation program will be designed.

Issue: Nuclear waste heat generation

One commenter requested detailed information on ambient temperatures and heat generation during isolation of the waste.

Response

Section 6.3.3.2.4 on preclosure rock characteristics evaluates the potential for thermal effects to cause operational problems in the repository. Section 6.3.1.3.4 on postclosure rock characteristics evaluates the potential for thermal and radiation effects in the long-term isolation phase. Thermal calculations are reviewed in that section, as well as in the discussion of waste package performance in Section 6.4.2.1.1.

Issue: Recreation

Two commenters raised the potential for decreased use of the Death Valley National Monument and the Floyd R. Lamb State Park because of proximity to the Yucca Mountain site and the supporting railroad line.

Response

Effects on visitation at recreation facilities from the transport and disposal of nuclear waste may be evaluated if the Yucca Mountain site is approved for site characterization. Rail line discussions are addressed in the EA sections 5.1, 5.2, and 5.3.

Issue: Water rights

This issue concerns the possible inconsistency in the discussion of potential senior water rights located off the Nevada Test Site and other water rights discussed in the draft EA. One comment was received on this issue.

Response

Under Nevada law, water rights are held independently of land ownership. Those rights are allocated by the State of Nevada on the basis of the actual water supply available in a particular ground-water basin. Preliminary analyses in the draft EA and a revised analysis in the final EA indicate that sufficient water is available for existing rights and projected repository-related requirements. This preliminary conclusion was consistently presented throughout the draft and final EA.

Issue: Effects of waste retrieval

This issue concerns whether the impacts associated with the retrievability phase of the project were adequately assessed. Two comments were received on the issue.

Response

The retrievability phase is merely the period of time after emplacement is completed during which the repository must remain open in case retrieval operations are initiated. During this period, there would be essentially no activity at the repository. Impacts associated with actual retrieval operations have not been addressed. To clarify this point in the final EA, the retrievability phase has been referred to as the "caretaker" phase, or some other aptly descriptive phrase, that reflects the types of activities that will be taking place during that time.

Issue: Effects on the physical environment

One commenter recommended that the effects of a repository on physical characteristics should be of greater importance and receive more consideration than socioeconomic factors. A second commenter was concerned that the impact analysis was too generalized.

Response

Physical factors are thoroughly considered in the postclosure siting guidelines and in four preclosure guidelines. The intent of the impact assessment in the EA is to evaluate impacts against the 10 CFR Part 960 guidelines by using available referenceable information. A more thorough impact analysis will be done as a part of the studies associated with the Environmental Impact Statement.

Issue: Application of major Federal environmental laws

One commenter questioned why the summary of major Federal laws that may apply to a repository was different in the Yucca Mountain EA from the summary in the salt site EAs. Another commenter asked why only Clark and Nye counties had been considered in the EA, when the Nuclear Waste Policy Act provides that the entire State of Nevada becomes the "affected area."

Response

Draft EAs written for the salt sites presented a list of requirements that may or may not apply (e.g., the Coastal Zone Management Act of 1972 clearly does not apply to the Texas site but has been included in its EA). The Yucca Mountain site draft EA did not take this same broad purview; it included only those laws that do apply. The EA was revised to contain a consistent list of requirements.

The DOE will comply with all of the Federal, State, and local laws and regulations that apply to the Yucca Mountain site. These regulations will continually be evaluated over the next 6 years before repository development to ensure that the repository is in compliance with applicable regulations. The evaluation will include further analyses to cover the broader region of impact.

C.7.2.1 Land use

This category addresses comments on the effects on land use if a repository is developed at Yucca Mountain; a total of fourteen comments were received.

Eight commenters requested that the U.S. Department of Energy (DOE) clarify the discussion about the acreage that would be required for withdrawal at Yucca Mountain if a repository is constructed. Another comment concerned potential land-use impacts from housing and commercial development in the vicinity of Yucca Mountain as a result of repository development. Other commenters asked about the ramifications if U.S. Air Force (USAF) land was unavailable for the proposed Yucca Mountain repository. One commenter contended that transportation impacts to the Las Vegas Paiute Council's holdings, which are near potential transportation routes, were not adequately addressed in the Environmental Assessment (EA).

Response

In brief, the land area for which the DOE must obtain control for development of a repository at Yucca Mountain is no larger than 24,710 acres (i.e., the controlled area), which includes Bureau of Land Management, Nevada Test Site, and Nellis Air Force Base lands. The Bureau of Land Management portion to be withdrawn is approximately 5,000 acres. The number of 50,000 acres was in error, and the EA has been changed to accurately explain the acreage.

Induced growth is important, but it would be premature in the planning process to conduct a detailed impact assessment of secondary impacts. The assessment will be conducted as part of the Environmental Impact Statement process. The DOE will comply with applicable State and local land-use regulations.

Because the USAF land is an integral part of the proposed site and because of the progress of the repository site-selection process, all legal as well as interagency cooperative consultation processes are being pursued. If Yucca Mountain is chosen as the first repository site, a land withdrawal action will be initiated. At this point in time discussions between all involved agencies are continuing toward resolving any conflicts that may exist.

The Paiute Council has not been designated an affected Indian Tribe within the meaning of Section 2(2)(B) of the Nuclear Waste Policy Act of 1982. However, specific note was made in Section 5.4.4.2 of the draft EA that a potential exists for impacts on Native American cultures from transportation activities. Detailed analysis of impacts to communities along transportation corridors would be undertaken once actual routes are identified.

C.7.2.2 Ecosystems

Twenty-three comments dealt with the impacts of the proposed repository on the ecosystems found at the Yucca Mountain site. These comments were classified into the following issues: (1) Mitigation Measures, (2) Endangered Species, (3) Effects of Soil Heating, (4) Railroad Spur Construction, (5) Ash Meadows, and (6) Miscellaneous.

Issue: Mitigation measures

Seven comments were received in the area of mitigation measures that were divided into three topics: impact on flora and fauna, impact on the desert tortoise, and rehabilitation of drill sites.

Impact on flora and fauna. Two commenters asked what provisions had been made to minimize the destruction of vegetation (and therefore, habitat loss) and suggested that emphasis be placed on discussion of habitat loss and the associated permanent reduction in wildlife populations.

Response. Efforts will be made to minimize or mitigate the effects of the repository project on flora and fauna. The destruction of approximately 680 hectares for site characterization and repository development should not affect the ecological balance of the surrounding, similar habitat. Reclamation and restoration procedures will serve to mitigate the long-term ecological effects of the project and help to eventually return the site to the desert ecosystem.

Further, it is agreed that destruction of vegetation, in most cases, results in the destruction and not mere displacement of the wildlife inhabiting the affected area. Thus, the discussion in Section 5.2.4 in the draft Environmental Assessment (EA) about displaced wildlife has been revised to address their probable destruction.

Impact on the desert tortoise. Three commenters expressed concern that discussions involving impacts to the desert tortoise be presented with the thought that the species may soon be afforded threatened-species status. Further, these comments questioned why translocation was not considered a viable mitigation measure.

Response. The recommendation that tortoises not be translocated was based primarily on the studies that showed that captive tortoises reintroduced into the wild had low survival rates. Whether a viable plan or method of translocating tortoises can be developed for Yucca Mountain requires further study. However, references to translocating tortoises have been modified to indicate that the technique may be used after further study.

Rehabilitation of drill sites. Three commenters questioned the procedures to be used in rehabilitation of abandoned drill sites and suggested that rehabilitation could begin with existing disturbed sites.

Response. Site investigations will be carried out to establish the best approaches for dealing with the disturbed sites; it should also be noted that

reclamation requirements are specified in the Nuclear Waste Policy Act (1983).

Issue: Endangered species

Three comments were received on this issue, all of which dealt with impacts to threatened or endangered plant and animal species. The first noted that the draft EA does not include an assessment of the potential damage to the habitats of endangered species or their well-being. Another related comment indicated the existence in the Project area of both the Mojave fishhook cactus and the desert tortoise, and indicated the need for a plan specifying protection measures to be employed during construction and operation. One commenter referenced an inventory entitled Nevada Outdoor Recreation Resources Index and Survey, and suggested that it be reviewed for additional information.

Response

No federally listed threatened or endangered plant or animal species occur within the Yucca Mountain study area, although the desert tortoise and Mojave fishhook cactus are currently under review for such status. Ad hoc protective measures designed to mitigate the impact of the repository project on the desert tortoise and Mojave fishhook cactus are discussed in chapters 4, 5, and 6 of the EA. These measures involve the use of preconstruction surveys at all sites to be disturbed. Using information gathered during preconstruction surveys, construction activities can be sited to avoid the cactus and desert tortoise. The reference to the Index and Survey has been noted.

Issue: Effects of soil heating

One comment that was submitted twice cited the statement within the draft EA that heat generated by wastes is expected to increase the temperature of the ground at the surface of the site by approximately 1°C (approximately 2°F), and that the resultant ecological consequences are not expected to be significant. This conclusion is considered in the comment to be inconsistent with other statements that say available information is insufficient to enable quantification of ecological consequences resulting from the temperature increase.

Response

The EA does state that the ecological consequences of raising soil temperatures are unknown at this time. The expectation that significant ecological impacts would not occur was based on the small temperature increase and the size of the affected area (approximately 800 hectares or 1,977 acres). Further, it is doubtful that temperature-induced changes to 800 hectares would have a significant effect on the vast amount of similar, unaffected desert habitat in the region.

Issue: Railroad spur construction

One comment that was submitted twice noted that the EA briefly discussed possible development of a railroad spur from near Las Vegas to the Yucca Mountain site, but provided no discussion of the potential impacts of such a rail spur on wildlife values. It was stated that if the proposed development included a rail spur, the final EA should address the potential impacts of the same.

Response

While the EA does discuss the possibility of developing a railroad spur from the vicinity of Las Vegas to the Yucca Mountain site, no final determination has been made as to the use of rail transport or routing if rail transport is to be used. When these plans or decisions are completed, additional assessment studies will be carried out to investigate the impacts and effects of such actions.

Issue: Ash Meadows

Four commenters expressed concern that construction and operation of a repository will cause irreparable damage to Ash Meadows in such areas as drawdown of the water table due to ground-water usage, long-term contamination of ground water, and endangering of resident species and citizens.

Response

Construction and operation of a repository will not cause a drawdown of the water table in Ash Meadows because ground water used for repository purposes will be drawn from the Alkali Flat-Furnace Creek Ranch ground-water basin, which is not part of the recharge system for Ash Meadows. Similarly, no detrimental impacts are expected at the site with regard to floral or faunal species. Since Ash Meadows receives no ground water from the Alkali Flat-Furnace Creek Ranch ground-water basin, no contamination of the ground water is expected to occur.

Issue: Miscellaneous

Five comments were received which represented personal opinions regarding ecosystems studies. Most of these were philosophical statements regarding the science of ecosystem study.

Response

These comments were noted, but no specific response was possible, and no change to the EA was required.

C.7.2.3 Air quality

Many of the fourteen comments received in the category of air quality dealt with the dispersion modeling analysis presented in the Environmental

Assessment (EA). There were also concerns raised over the inclusion of emissions associated with the project without subsequent comparisons of these emissions to standards. Two commenters questioned the effects from secondary emission sources like trucks. Another asked that emission of radionuclides in relation to the standards be evaluated. A commenter suggested stringent controls on zeblitic rock mining and disposal. A commenter suggested that there seemed to be discrepancies in the amount of land that may be disturbed. A few questions were asked about the proposed monitoring presented in the referenced Meteorological Monitoring Plan. Additional commenters requested that the reference to Nevada Air Quality Regulations be correctly cited as NAC 445 (State of Nevada, 1981).

Response

Every attempt was made to base the analysis on data that have been published and were available to the general public. As such, the air quality analysis is based almost exclusively on a report prepared for the U.S. Department of Energy (DOE) by the Desert Research Institute. Because the repository design specifics have changed as the project has developed, the repository design now envisioned at Yucca Mountain is slightly different from that used in the referenced document. Therefore, certain modeled parameters were adjusted to more realistically reflect the present design. The basis for these adjustments is included in the draft EA and has been reviewed for consistency. The reader is cautioned, however, that the analysis based on this report is a screening-level assessment that is meant to identify potential impacts that can be more fully evaluated using detailed, comprehensive emission calculations, onsite meteorological data instead of assumed worst-case conditions, inclusion of readily available standard pollutant control techniques, and more sophisticated computer dispersion modeling techniques. This process will be carried out if the project proceeds through site characterization and subsequent environmental documents are prepared. However, the screening-level assessment does indicate that the Project can be developed without violating applicable ambient air quality standards.

Much of the emission information was included merely for comparative purposes and could not be related to ambient air quality standards without further dispersion analyses.

A detailed evaluation of construction impacts due to transportation from Las Vegas and other secondary impacts would be conducted in the Environmental Impact Statement process if Yucca Mountain is selected for further development.

The air quality analysis presented in Section 5.2.5 of the draft EA specifically excluded radionuclide emissions and their subsequent impacts. Radiological impacts are discussed in sections 5.2.9 (Radiological Effects) and 6.4.1 (Preclosure Radiological Safety Assessments) of the draft EA. These impacts, however, are not compared to limits set forth in 40 CFR Part 61 because Subpart H of 40 CFR Part 61 excludes DOE facilities that are regulated under 40 CFR Parts 190, 191, or 192. The repository at Yucca Mountain would comply with releases set forth in 40 CFR Part 191 (Environmental Radiation Protection Standards for Management and Disposal of Spent Nuclear Fuel, High-Level and Transuranic Radioactive Wastes) rather than 40 CFR Part 61.

Data on the properties and hazards of mining zeolitic material underlying the proposed host rock will be collected during site characterization. This information can then be used to ensure that worker and public health is protected by applying appropriate control measures.

Discrepancies in the amount of land that will be disturbed during the various stages of repository development arise from the dynamic nature of the repository and exploratory shaft design. Plans for these facilities change as more information becomes available, and will most likely not become final until a decision has been made to proceed with development at Yucca Mountain. Estimates of disturbed land in the draft EA were those that were being considered when the draft EA was published and that were considered reasonable estimates.

The meteorological monitoring program is a separate element of the development at Yucca Mountain that will support permitting and licensing activities. As such, it has no bearing on the information and conclusions presented in the draft EA.

The references to Nevada Air Quality Regulations have been corrected in the final EA.

C.7.2.4 Aesthetic conditions

This category assesses the changes imposed on aesthetic conditions which will be caused by site characterization and repository development. One comment was received which suggested that aesthetics of the facilities and the supporting railroad be explicitly discussed in the final Environmental Assessment (EA).

Response

The new rail line will be visible to highway travelers along most of the proposed right-of-way. The trains are not expected to cause an unacceptable impact to the people living or driving along the rail line. The effects of the repository activities on aesthetics are addressed in a preliminary manner in Section 5.2.7 of the draft EA. The effects of site characterization activities on aesthetics are addressed in Section 4.2.1.5 of the draft EA.

C.7.2.5 Noise

This category assesses the impacts of increased noise levels resulting from site characterization, repository construction, and repository operation. Five comments were received. Two comments related to impacts resulting from construction noise, two comments related to truck transportation noise, and one commenter questioned what the U.S. Department of Energy will do to maintain the 55 dBA noise level.

Response

The estimate of construction noise was based on the most intense periods of construction, regardless of time, in Table 5-22 (Summary of maximum noise impacts from construction activities) of the draft EA. Surface construction activities, which are scheduled for a 5-year period, will have no impact on urban Las Vegas. Truck transport related noise was calculated for areas which would experience the most significant increase in noise levels. These are areas in which (1) existing noise levels are the lowest (i.e., rural areas) and (2) the least traffic exists (i.e., the proposed access road corridor and U.S. Highway 95 outside Las Vegas). The incremental increase in the noise level in the Las Vegas metropolitan area due to truck transport related noise would be nearly indistinguishable to the human ear.

The 55 dBA annual day/night noise level is a guideline; it is not a standard. However, during site characterization, it is possible that noise levels may be measured in order to establish a baseline. The impacts noted in this section will be reevaluated during field investigations in support of the Environmental Impact Statement process. If required, maintenance or mitigation measures will be proposed at that time.

C.7.2.6 Archaeological, cultural, and historical resources

This category addresses the potential impacts to archaeological, cultural, and historical resources resulting from the construction and operation of a repository at Yucca Mountain. Because of the variety of subjects covered by the eleven questions, these comments have been divided into three issues, as follows: (1) U.S. Department of Energy (DOE) Interaction with Federal and State Agencies, (2) Current Use of the Land by Native Americans, and (3) Miscellaneous.

Issue: DOE interaction with Federal and State agencies

Four comments were received on this issue. Several commenters stated that the draft Environmental Assessment (EA) should have described the interaction between the DOE and the Nevada State Historic Preservation Officer, and with the keepers of the National Register of Historic Places and the Advisory Council on Historic Preservation to ensure compliance with the National Historic Preservation Act.

Response

A programmatic Memorandum of Agreement between the DOE, the Nevada State Historical Preservation Officer, and the Advisory Council on Historic Preservation will, when prepared, describe the interactions between and the roles of three agencies during the Nevada Nuclear Waste Storage Investigations Project.

Issue: Current use of the land by Native Americans

Two commenters requested that information be presented in the EA about current uses of the land by Native Americans, not just historical uses.

Response

Historic and prehistoric cultural resources in the Yucca Mountain area document the seed gathering and hunting activities of Native Americans. Consequently, there is little doubt that this area has been used by Native Americans. Nevertheless, the majority, if not all, of the proposed area probably has not been used by Native Americans since Federal land withdrawal in the early 1940s.

Issue: Miscellaneous

Five comments were assigned to this issue. Several questions were received about direct and indirect impacts to archaeological, cultural, and historical resources, including the effects from road and rail construction. Also questioned was the DOE mitigation plan in which a 10 percent sampling of some sites was deemed by the DOE to be adequate; the comment suggested an 80 percent sampling. Finally, one commenter took issue with the statement in the draft EA that some sites would be avoided or salvaged.

Response

By preparing and implementing a plan to mitigate direct and indirect impacts (the programmatic Memorandum of Agreement mentioned in preceding paragraphs), the potential loss of archaeological and cultural resources caused by all project activities should be kept to a minimum.

The sampling percentage at each site will be determined in accordance with the programmatic agreement described in preceding paragraphs. A statement has been added to Section 4.2.1.6 of the final EA, however, stating that before any activities begin, all sites in the area would be identified and evaluated for their significance and eligibility for the National Register.

C.7.2.7 Background radiation

Thirteen comments were received concerning radiological health impacts of developing Yucca Mountain as a nuclear waste repository. In the context of the Environmental Assessment (EA), background radiation refers to those radionuclides already present at the site. Comments received in this category have been divided into two issues: (1) Adequacy of the Analysis and (2) Radioactive Releases.

Issue: Adequacy of the analysis

Of the nine comments received on this issue, one commenter noted that the analysis in the EA of accidents during repository operation was difficult to assess and should contain more discussion on the methods and data used, as well as the costs incurred as a result of the postulated accidents.

Another concern was that the basis for much of the accidental-exposure data contained in the draft EA was based on a report that had been revised to include the possibility of a phased repository subsequent to the issuance of

the draft EA. Several commenters questioned the ability of the site to contain stored wastes and potential implications of releases to the environment. A commenter objected, without elaboration or specific reference to a section of the EA, that there is a chance of release of radioactivity at the site. A last commenter asked for a simplified explanation of what the EA contained.

Response

The accidental exposure analyses have not been revised to reflect the most recent design information (phased repository). Development of the two-stage concept occurred concurrently with the preparation of the EA, making revision impossible in the time available. Revisions to the reference design have not significantly altered the information presented in the draft EA, principally because the maximum waste-receiving rate has not changed. The safety issue will be dealt with in a more comprehensive manner through the permitting and licensing process if Yucca Mountain is selected as a candidate for further development. An expanded discussion of the phased repository concept has been presented in Section 5.1 of the final EA. In addition, further discussion has been added to describe the bases and assumptions used.

The repository will be so sited and designed that releases to the accessible environment do not occur for a minimum of 10,000 years. Section 6.4.2 of the draft EA presents information on cumulative radioactivity releases at 10,000 and 100,000 years and inventories of the various radionuclides and their half-lives. But no discussion is included of the potential damage from releases of radioactivity to the environment because all the predicted releases are well below the Federal standards. Additional information on the method used to assess the impacts of construction activities has been provided in the final EA.

With regard to what the EA contains, Section 3.4.7 explains the types of background or existing radiation at the site, prior to any development. This section also explains the radiation dose assessment. Section 5.2.9 of the EA explains those radiological effects expected to occur as a result of locating a repository at Yucca Mountain. The explanation includes units of measure for assessing biological effects and the types of radiation that may cause those effects.

Issue: Radioactive releases

Four comments were received on this issue; all dealt with measures of radiological releases. One commenter asked how many rems is a dangerous dose. Another commenter questioned the potential exposure as a consequence of vapor and gas venting through natural fractures. The releases of radon appeared low to another commenter, who compared them to releases from mining activities. A last commenter noted that 10 CFR Part 20 does not specify "a design objective" of 5 rems per year; rather, the limit is 3 rems per quarter, not to exceed 5(N-18) rems, which yields an average annual dose of 5 rems per year.

Response

It is difficult to define a dangerous dose, since the threshold for effects requiring medical attention varies widely depending on the sensitivity of the individual, the type and energy of radiation, the time over which the dose is delivered, etc. An appendix describing radiation health effects and doses will probably be included in the Environmental Impact Statement. For the types of exposures (whole body) resulting from normal transportation, no detectable clinical effects (e.g., nausea, low blood count) would result at doses below approximately 25,000 millirems. This figure is thousands of times higher than the doses likely to result. The information concerning medical aspects of radiation exposures and the levels at which effects can be detected was taken from "The Handbook of Radioactive Nuclides" (Wang, 1969).

The consequences of radioactivity accompanying a release of gaseous radionuclides through the natural fracture system in the repository medium depend on factors such as the number of waste disposal containers that are breached, the age and cladding integrity status of the fuel involved, and the nature of the fracture system. It is extremely unlikely that any postulated venting through fractures would result in exposures comparable to those calculated for normal operational releases, which are discussed in Section 6.4.1.2.2.

The calculations regarding radon releases have been reviewed, and the magnitude of these releases is correct. These values are based on Table 5.4.8 (granite medium) of the U.S. Department of Energy Environmental Impact Statement document (DOE, 1980). However, since the current repository design differs from that in the draft EA, these values have been revised to reflect the differences in excavation volume.

The comment regarding the design objective is correct. The occupational whole body exposure limit is 3 rems per quarter. The dose to the whole body, when added to the accumulated occupational dose shall not exceed $5(N-18)$ rems where N is the age of the individual in years. The terms under 10 CFR Part 20 do not specify a "design objective." The text will be revised to correct the dose limit, and to state that the design objective will incorporate "as low as reasonably achievable" (ALARA) principles and will be within regulatory limits.

C.7.3 EXPECTED EFFECTS OF TRANSPORTATION

Comments regarding effects of transportation have been subdivided into the following two major areas: (1) comments that are applicable to all potential sites; of national interest; or derived from national laws, regulations, policies, etc; or (2) comments that are site-specific.

The first set of comments are described and responded to in Section C.2.4.1 of this Appendix. Where the response calls for a change in the Environmental Assessment (EA), it is usually contained in the transportation

appendix. The second set of comments is described and responded to in the issues described below.

This issue concerns the assessment of the effects of transporting nuclear waste as well as all operations-related personnel and materials to the potential Yucca Mountain repository location. The 202 comments in this category were assigned to the following issues: (1) Radiological Exposure, (2) Emergency Response, (3) Routing Data and Analyses, (4) Guidelines and Conclusions, and (5) Miscellaneous.

Issue: Radiological exposure

Fifty-two comments were received under the Radiological Exposure issue of transportation impacts. This issue addresses potential radiological exposure to the public from a transportation-related scenario.

These comments were focused primarily on the following topics: site-specific radiological exposure, transportation risk and cost assessment, and discrepancies in tables and text.

Site-specific radiological exposure. Most of the commenters in this topic requested more information on the potential for regional and local radiological exposure, population density, location of maximum radiation exposure, fatalities, accidents, and RADTRAN II methodologies. It was suggested that residents of Caliente may receive doses approaching the dose calculated for the maximally-exposed individual. One commenter noted that visitors and tour guides at Hoover Dam could receive significant doses from shipments passing over the dam. It was pointed out that any nuclear accident in Las Vegas would destroy the tourist industry. It was also suggested that the EA include exposures for subgroups within occupational and non-occupational population groups.

Response. More region-specific information on the potential risk of public exposure to radiation has been developed for the final EA and will be further developed during the Environmental Impact Statement process. In particular, route-specific population data have been incorporated into the impact assessment, and a maximum-credible accident scenario has been added. In addition, risk associated with transportation of high-level waste through areas such as Caliente and over Hoover Dam will be investigated in association with the Environmental Impact Statement. The transportation appendix of the final EA includes more information regarding accidents and the maximally exposed individual, as described in Section C.2.4.1 of this document. There is little evidence that a transportation accident in Las Vegas would have any long-term effect on tourism. Nevertheless, the U.S. Department of Energy (DOE) plans to comply with all applicable standards and regulations in an effort to prevent such accidents.

Table 5-36 (Estimated population radiation doses from the transportation of waste to Yucca Mountain) of the draft EA was not changed in the final EA to include exposures for subgroups within the occupational and non-occupational population groups because, considering the uncertainty in the dose estimates, little would be gained by further breakdown of exposure categories. In addition, Appendix A includes an assessment of occupational exposures due to postulated accidents.

Transportation risk and cost assessment. Some commenters suggested that the draft EA be revised to clarify the basis for the truck and rail fatality comparisons. Several commenters indicated that the transportation risk assessment in the draft EA is incomplete without the inclusion of a worst-case accident scenario. There was a concern expressed by some reviewers that the waste carrier would not comply with highway speed limits and that transportation risk assessments should evaluate all phases of repository development. One commenter requested that Section 5.3.2.1 of the draft EA be revised to include specific information about exposure of drivers and handlers. In addition, a commenter stated that human error-related incidents would be unpredictable. One commenter noted that more information on costs for new highway and railroad facilities constructed to bypass populated areas should be provided.

Response. Section 5.3.2.2 of the final EA has been revised to clarify the basis for the truck and rail fatality comparisons. The EA has been revised to include credible accident scenarios.

Waste carriers will be required to follow specific operating procedures, which include obeying posted highway speed limits.

Additionally, refined cost information will be developed during the Environmental Impact Statement process. Nuclear waste shipments will not be routed away from populated areas unless it is demonstrated that risks are reduced by such measures. Appendix A presents U.S. Department of Transportation routing regulations in detail.

All phases of the repository including construction, operation, retrievability, and decommissioning will be discussed in the Environmental Impact Statement. Section 5.3.2.1 has been revised to include information on occupational and nonoccupational exposures from normal and accident conditions. Human error can never be totally predicted, but most serious accident scenarios can be postulated and contingencies developed for these events. Appendix A assesses the impacts of a severe transportation accident. Human error is also discussed in Section C.2.4.1 of this document.

Discrepancies in tables and text. It was suggested that Table 5-57 (Summary of environmental effects associated with the construction, operation, retrievability, and decommissioning phases of the repository) in the draft EA (Section 5.5) include in the Standard Operating Practice column that the waste would be routed away from urban areas. The accident rates in Table 5-31 (Projected annual accidents on U.S. Highway 95, 1996) of the draft EA (Section 5.3.1.1.2) were also questioned.

It was suggested that tables 5-38 (Assumed regional transport conditions for scenario I) and 5-39 (Assumed regional transport conditions for scenario II) in the draft EA (Section 5.3.2.1) be changed to include actual route population, accident-rate history, and stop-time data.

An apparent inconsistency between statements was noted: Section 5.3.2.1 of the draft EA stated that accidents severe enough to release radioactivity are extremely unlikely, while Section 5.2.9.2.3 identified four transportation accidents that would result in potential releases. It was also stated

by one commenter that the tests of impact damage to shipping casks using truck and train tests proved that nuclear waste can be transported safely.

Response. Table 5-57 (Summary of environmental effects associated with the construction, operation, retrievability, and decommissioning phases of the repository) in Section 5.5 has been revised to include standard operating practices that minimize the potential impacts of transporting radioactive wastes. These practices include complying with the regulations described in Appendix A.

Accident rates in Table 5-31 (Projected annual accidents on U.S. Highway 95) in Section 5.3.1.1.2 may not be appropriate for high-level waste shipments which generally have a lower accident rate than other types of travel (Foster and Jordan, 1984). Accident statistics presented in Table 5-31 are based on projections of historical data including accidents due to inclement weather (Pradere, 1983).

Tables 5-38 (Assumed regional transport conditions for scenario I) and 5-39 (Assumed regional transport conditions for scenario II) in Section 5.3.2.1 of the draft EA were revised to include actual route population data. Route-specific accident rates and stop times will be developed in association with the Environmental Impact Statement. The EA presents a revised dose assessment for two routing scenarios of postulated truck and rail shipping modes using route-specific population data.

The transportation accidents in Section 5.2.9.2.3 are accidents postulated to occur at the repository receiving facilities. These accidents are extremely unlikely and do not result in serious releases of radioactivity.

Issue: Emergency response

Twenty-six comments were received on the emergency response issue. These comments and responses address the plans and procedures necessary for responding to a transportation-related nuclear waste accident.

Most of the commenters requested more detailed emergency response information including: responsibilities of and resources required by Federal, State, and local jurisdictions; present and future plans; cost to communities; training; personnel; and equipment. Commenters also questioned the need for more information on insurance including Price-Anderson criteria and the costs associated with a potential uncontrolled release of radioactivity. Several commenters requested more information on responsibilities of the Nevada agencies that already exist.

Response

The brief discussion of emergency preparedness in chapters 5 and 6 and Appendix A of the EA provides the data to evaluate the suitability of Yucca Mountain for site characterization. More detailed information and evaluation concerning costs, resources, and responsibilities will be developed in the Environmental Impact Statement process. Local government response capabilities will be evaluated, including their ability to respond to remote areas.

Appendix A of the EA has been revised to include more information concerning the costs of an accidental release of radioactivity. A description of the Price-Anderson Act, which provides coverage for public liability in the event of a nuclear incident, as well as the DOE role in implementing the Price-Anderson Act, is presented in Appendix A.

The Nevada Health Division and Division of Emergency Management (DEM) will be contacted and interviewed as more detailed information is required for the Environmental Impact Statement. Additional DEM references will be included in the Environmental Impact Statement. Table 2-8 (Summary of evaluations of the Yucca Mountain site against the disqualifying conditions) in Section 2.3 was revised to explain that the emergency preparedness plan should be prepared in cooperation with State and local planning officials. The section discussing the disqualifying condition for population density and distribution was revised to explain that a Memorandum of Understanding exists between the State of Nevada and the DOE defining responsibilities in response to a radiological accident. The references for Chapter 2 were revised to include the DOE Nevada Operations Office reference on notification procedures (DOE/NVO, 1985). Section 5.3.2.6 describes the function of the DEM and explains that the DEM provides radiological monitoring training.

Issue: Routing data and analyses

Sixty-nine comments were categorized within this issue. The routing data and analyses are associated with various postulated transportation routes for nuclear waste shipments. Topics addressed include: route information, population areas, railroad versus truck transport, peak traffic conditions, and settlement patterns.

Route information. Several commenters were concerned over the location of transportation routes to be used for the shipment of high-level waste, how these routes were selected, and potential impacts to people living along these routes. In addition, comparison of the various alternative routes was requested. More site-specific data was requested, including data on weather, accidents, road and railroad conditions, costs for route improvements, and population densities. It was also suggested that the railroad spur be located south of U.S. Highway 95. One commenter stated that some of the intended regional and national transportation networks go through local towns and communities.

Response. A designated preferred route was identified in the final EA; specific route selection, and the potential effects to people along the route will be evaluated in the Environmental Impact Statement. Regional site-specific data will be provided for each postulated road and rail route. Specific information to be provided will include data on weather, accidents, population densities, route conditions, etc.

The Environmental Impact Statement will discuss all repository phases including construction, operation, retrievability, and decommissioning. This document will answer where the shipments will go, how the waste will be transported, and the potential risk from these shipments. The shipment of waste will comply with applicable Federal and State laws. The DOE is also considering an alternative corridor for the railroad spur south of U.S. Highway 95. In response to one comment, the proposed railroad spur will not

cross the Desert National Wildlife Refuge. The transportation effects to local towns and communities have been assessed as part of the transportation analysis. Further studies will be accomplished in conjunction with the Environmental Impact Statement process.

Population areas. Commenters suggested that the EA present more maps showing regional transportation routes, rather than just maps near Yucca Mountain, and the community impacts along the preferred routes. Another commenter suggested that the real cost of new facilities would be the cost of building facilities to route the waste around populated areas of Clark County. Commenters also suggested that Chapter 5 should have more information on operating procedures such as loading and unloading of casks.

Response. Transportation sections in Chapter 5 of the EA have been revised to include enhanced route maps. The EA addresses radiological and nonradiological impacts along the State's only designated preferred route (i.e., U.S. Highway 95 from Las Vegas to Beatty) as well as other postulated routes. More encompassing community impacts for regional routes will be presented in the Environmental Impact Statement.

Federal highway routing guidelines (49 CFR 177.825) passed in response to the Hazardous Materials Transportation Act are described in Appendix A of the final EA. Operating procedures for the transportation of waste will include complying with all regulations applicable to such shipments. A summary of these regulations is presented in Appendix A of the final EA.

Rail versus truck transport. Information was requested on the 30-70 percent split in favor of railroad transport that was presented in Section 5.1.2.1.

Response. The 30-70 percent split is a best guess for all shipments made to the first repository and is based on existing facilities at reactors. Slight variations around these values will not significantly affect repository or transportation operations. Additional discussions of the modal split are presented in Section C.2.4.1 of this Appendix.

Peak traffic conditions. One commenter was concerned with the need for more data on trips associated with induced and indirect travel as well as travel associated with immigrating direct workers. Other commenters suggested that the EA did not indicate possible damage to roadways because of extra heavy truck hauls. It was suggested that the EA did not evaluate peak conditions but only routine operations and that the incremental use of the main line in Las Vegas should be calculated.

Response. Section 5.4.3.7 of the EA discusses where immigrants may locate. Trips and potential accidents will probably occur close to these locations. The EA presents a traffic increase of 2.6 percent on major arteries.

The EA considers legally weighted trucks following interstate standards. Upgrading of roadways will again be considered, as appropriate, before transporting waste.

The average numbers used to calculate levels of service are conservative and already account for some unpredicted conditions. Peak conditions as noted may decrease the level of service, but when the frequency and duration of such peak conditions are accounted for, constructing facilities for these peak conditions does not seem practical. The EA includes the incremental usage of the main line in Las Vegas in Section 5.3.

Settlement patterns. Table 5-29 (Settlement patterns of Nevada Test Site employees) of the draft EA (Section 5.3.1.1.1) was questioned for the use of ZIP codes as the resource for determining settlement patterns. In Section 5.3.1.1, it was questioned whether existing road conditions maximize or minimize risk. A commenter suggested that two tribal governments were not mentioned in the transportation section.

Response. ZIP codes were used in Table 5-29 in Section 5.3.1.1.1 of the draft EA to determine the major routes used by the majority of Nevada Test Site employees. See Section 3.6 of the final EA and Section C.4.1.5 of this Appendix for a discussion of ZIP codes as the basis for allocating projected repository-related population to communities.

The two tribal governments were not mentioned because there was no attempt to identify responsible parties along any of the possible Nevada routes. Such regional identification is beyond the scope of the EA process.

Issue: Guidelines and conclusions

Thirty-one comments were received on transportation-related guidelines and conclusions. Several of the transportation comments related to the evaluation of the site against the 10 CFR Part 960 guidelines presented in Chapter 6. The comments have been grouped into the following topics: guideline-related conclusions, weather conditions, and construction requirements.

Guideline-related conclusions. A few commenters questioned the guideline-related conclusion in Table 6-12 (Summary of analyses for Section 6.2.1.8, Transportation) that significant upgrading would not be required. It was also suggested that the conclusions in Table 6-12 were tenuous and that the analysis falls short of addressing regional impacts as specified by the Nuclear Waste Policy Act. Other commenters questioned the validity of the guideline-related conclusion in Table 6-14 (Summary of analyses for Section 6.2.2.2, Preclosure system guideline: environment, socioeconomics, and transportation) since an accident and worst-case release were not analyzed. Another commenter noted that credit should not be taken in the evaluation against the guidelines for the existence of the State of Nevada emergency preparedness plan, since it is questionable whether the plan would provide an effective procedure for handling a transportation accident involving an uncontrolled release of radioactive material. One commenter stated that the documentation relative to the qualifying condition was deficient because there was inadequate consideration of variables associated with the proximity of power plants or temporary storage to the repository. One commenter stated that the whole transportation network violates a disqualifying condition that states that no surface facility will be located in a populated area or adjacent to a high density area.

Response. With regard to the guideline addressing upgrading (Table 6-12), although not explicitly clear, upgrading refers to local roads and railroads. Since the proposed access road will intersect U.S. Highway 95, a regional highway, and the proposed railroad spur will intersect the Union Pacific main line, there will be no repository-related traffic (and therefore no upgrading requirements) on local roads and railroads. U.S. Highway 95 will experience some degradation in the level of service during peak periods. Neither this degradation nor the number and weight of trucks analyzed in the EA require that upgrading and improvements be made. However, this will be assessed in more detail during the Environmental Impact Statement process.

The final EA addresses accidents both in Chapter 5 and Appendix A, and the conclusion reached in Table 6-14 (Summary of analyses for Section 6.2.2.2, Preclosure system guideline: environment, socioeconomics, and transportation) has been modified accordingly. Discussions regarding emergency response in Nevada were provided as input for the evaluation of the transportation guidelines in Chapter 6 of the draft EA. It was not the intent of the EA to do a complete analysis of an emergency response situation, but rather to present the information required for the transportation guideline. Detailed evaluations of emergency response requirements will be performed in conjunction with the Environmental Impact Statement.

The EA has been expanded to include temporary storage considerations. This is the Monitored Retrievable Storage (MRS) analysis found in Section 5.3.2 and revised Appendix A.

Under the Siting Guidelines, surface facilities are defined as "... repository support facilities within the restricted area ..." (10 CFR 960.2). A restricted area is defined as "... any area to which access is controlled by the DOE for purposes of protecting individuals from exposure to radiation and radioactive materials before repository closure ..." From the discussion accompanying the final version of the Siting Guidelines (10 CFR Part 960) it is clear that interstate highways and railroads used for transporting nuclear waste are not considered to be surface facilities for the purpose of evaluating the cited disqualifying condition.

Weather conditions. A few commenters questioned statements that weather conditions, especially flooding and rock slides, in southern Nevada would not affect transportation. Additionally, it was questioned how flash floods will be reduced by standard drainage control measures as discussed in Section 6.2.1.8.3.

Response. Weather conditions evaluated by the guidelines represent routine seasonal occurrences that could affect the repository acceptance rate. Data on road closures have been added to Chapter 6 of the final EA to indicate potential problems in this area. Mitigation measures for drainage control along transportation routes have not been identified. Existing problems along existing roads and railroads will be identified and mitigation measures will be developed during the Environmental Impact Statement process.

Construction requirements. A few commenters questioned the DOE's taking of a favorable condition for transportation when the site is 137 kilometers (85 miles) from the connecting railroad and that the railroad, including Dike

Siding, will need significant upgrading at considerable cost. Several commenters questioned whether local highways and railroads are sufficient to meet repository traffic needs without significant upgrading or reconstruction costs and why just the rail line from Dike Siding is considered in these costs.

Response. The DOE does not claim the favorable condition 1(1), as noted in Table 7-15 (Comparative evaluation of the sites against the guideline on transportation) of the draft EA because of the length and cost of the railroad spur (approximately 161 kilometers or 100 miles, instead of 137 kilometers or 85 miles) and access road. Favorable conditions 2 and 3 address the potential impact that the transportation network will have on local roads and railroads; specifically, favorable condition 2 addresses upgrading requirements while favorable condition 3 addresses proximity to regional highways and main line railroads.

The guidelines call for an evaluation of local transportation networks between the site and regional networks. Upgrading requirements (including cost) have been assessed and will be further evaluated in conjunction with the Environmental Impact Statement studies.

Issue: Miscellaneous

Twenty-four comments were grouped under this miscellaneous issue. These comments were further divided into three topics: data deficiencies, EA changes, and radioactive testing materials.

Data deficiencies. Commenters suggested that there may not be any experts in the area of waste transportation. Other commenters stated that the draft EA did not present enough data about routes, prenotification, escorts, and defense wastes. One commenter was concerned with the manner in which waste vehicles would be marked. Another commenter questioned the effects to a driver while traveling behind a waste truck, while another requested more information on the non-radiological effects of transportation.

Other commenters questioned liability for accidents and another questioned regulations governing waste transportation and their interpretation. One commenter requested a definition of low-level radiation, as it pertains to incident-free transportation of high-level waste.

Response. In the present context, low-level radiation refers to radiation dose rates that are not high enough to represent an acute radiation exposure hazard. Doses to persons exposed to low levels, as the term is used in the EA, are a small fraction of the doses received from natural background.

The DOE will follow the Nuclear Waste Policy Act in carrying out its mission of transporting and disposing of the waste. Experts that are available will be consulted. More specific information is provided in Appendix A on routes, prenotification, and escorts. The EA has been revised to consider defense waste shipments from Savannah River Laboratory, South Carolina; Idaho National Engineering Laboratory, Idaho; and Hanford Engineering Development Laboratory, Washington. Transport vehicles will be marked according to

Department of Transportation regulations. Effects expected to result from a driver following a waste disposal truck are calculated by the RADTRAN II model, and these are included in the results reported under the category of non-occupational, normal (i.e., incident-free) effects. Information on the nonradiological effects of transportation, including the factors used in their assessment, can be found in Appendix A of the final EA.

Liability for accidents will follow Federal Price-Anderson Act provisions. Regulations governing waste transport are presented in Appendix A of the final EA. Also, Section 5.3.2 of the EA has been revised to include more definitions of regulating terms.

EA changes. Several commenters stated that specific changes should be made to the EA in Section 5.3.2 and related transportation sections.

Response. Section 5.3.2 incorrectly states that variations from a route plan "... require 30 days notice ..." As set forth at 49 CFR 177.825(c), carriers of spent nuclear fuel must report any variation from the route plan as soon as possible but within 30 days following the deviation. The text has been changed to reflect the additional information. Additionally, the updated reference (DOT, 1984) has been obtained and correctly cited in the final EA.

The reference to "... State routing agencies, which were established by the states and are defined in 49 CFR 171.8 ..." in Section 5.3.2 created a false impression. Not all states have established state routing agencies. Such an agency may be a common agency of more than one state, such as one established by interstate contract. It may also be an Indian tribal authority who regulates and enforces highway routing requirements on tribal lands. In view of this, the above-quoted passage was changed to read, "State routing agencies as defined in 49 CFR 171.8."

Section 5.3.2 of the draft EA was also changed to more accurately represent U.S. Department of Transportation (DOT) regulations. As defined in 49 CFR 171.8, a State-designated route is one which is selected in accordance with the DOT guidelines "or an equivalent routing analysis which adequately considers overall risk to the public." The definition goes on to state expressly that, "designation must have been preceded by substantive consultation with affected local jurisdictions and with any other affected states to ensure consideration of all impacts and continuity of designated routes." The text of the EA has been modified to clarify the discussion. More detailed discussions of DOT regulations are presented in Appendix A.

The text in Section 5.3.2 stated that the State Routing Agency of Nevada "... has not identified the preferred transportation routes within the State ..." In fact, there has been a designation of U.S. Highway 95 between Las Vegas and Beatty, Nevada as a preferred route, and the text has been revised to reflect this information.

Table 5-33 (Projected annual accidents on U.S. Highway 95, 1998) incorrectly referenced Figure 5-8 (Surface facility plan for a two-stage repository) in the draft EA. The reference was corrected to Figure 5-9 (Total (60-year) resource requirement for vertical emplacement) in the final EA.

In Table 6-12 (Summary of analyses for Section 6.2.1.8, Transportation), item (8) of the draft EA was not changed to read "radioactive materials." The EA addressees only the effects of transporting radioactive wastes, and not all radioactive materials. Therefore, no judgment has been made regarding the plans, procedures, and capabilities for transporting all "radioactive materials."

Radioactive testing materials. One commenter asked what precautions would be taken on the transportation of radioactive testing materials for site characterization.

Response. Such shipments are routinely performed for hydrologic testing throughout the United States and will not amount to significant quantities. They will be carried out in compliance with State and Federal regulations. No impacts on the transportation network or on public health and safety are expected.

C.7.4 EXPECTED EFFECTS ON SOCIOECONOMIC CONDITIONS

Listed in this section are 93 comments dealing with the U.S. Department of Energy (DOE) evaluation of the Socioeconomic Impacts Guideline (10 CFR 960.5-2-6). Additional comments concerned general aspects of the Environmental Assessment (EA) evaluation of socioeconomic conditions in chapters 5 and 6. Because all of the latter group of comments covered more than one area of the socioeconomic impact analysis, responses to them were placed here, rather than in sections 7.4.1 through 7.4.5.

The comments have been assigned to 21 issues: (1) Favorable Condition 1, (2) Favorable Condition 2, (3) Favorable Condition 3, (4) Favorable Condition 4, (5) Potentially Adverse Condition 1, (6) Potentially Adverse Condition 2, (7) Potentially Adverse Condition 3, (8) Potentially Adverse Condition 4, (9) Disqualifying Condition, (10) Qualifying Condition, (11) Mitigation, (12) General Opinion, (13) General Comments, (14) Restriction to Clark and Nye Counties, (15) Moapa Indians, (16) Lack of Community-Specific Data and Analysis, (17) Safety Assumptions, (18) Mitigation Needs, (19) Transportation Effects Analysis, (20) Closure and Decommissioning, and (21) Special Effects.

Issue: Favorable condition 1

The DOE received three comments on favorable condition 1, "Ability of an affected area to absorb the project-related population changes without significant disruptions of community services and without significant impacts on housing supply and demand." One commenter stated that insufficient evidence is presented in the EA to determine whether the favorable condition is present. Another pointed out that "... significant disruptions ..." could have different meanings to the DOE and local communities. The third commenter questioned the validity of the historical population growth criterion, since changes are computed from small bases and because high growth rates in southern Nye County have been significantly influenced by the U.S. Department of Defense (DOD) and the DOE activities in the area.

Response

The criteria for evaluating the siting guidelines were designed to facilitate comparison of alternative repository sites. In order to use its resources effectively, the DOE conducted a coarse screening, and only investigated a few sites in detail according to the process specified in the Nuclear Waste Policy Act of 1982. In the case of the evaluation of favorable condition 1 for the Yucca Mountain site, county-level population changes were assumed to significantly affect community services and housing when the total (baseline plus repository-related) population increase in any year exceeded that historically experienced by the area. Whether historical growth rates may have been influenced by DOD and DOE activities is immaterial; the magnitudes of historical population growth rates, rather than their causes, constitute the basis for this comparison. Since the projected maximum one-year population growth rate with the repository would be less than average annual growth rates in recent years (see tables 3-15 and 3-16 of the final EA), favorable condition 1 is present.

It is true that "... significant disruptions ..." may be defined differently by the DOE and local communities. The draft EA has been revised to acknowledge this.

Issue: Favorable condition 2

The DOE received two comments on favorable condition 2, "Availability of an adequate labor force in the affected area." Both commenters questioned the adequacy of the analysis presented in the draft EA that leads to the conclusion that the favorable condition is not present.

Response

The evaluation of all favorable conditions is based on reasonable, but conservative, assumptions which aim to prevent exaggeration of the ability of a site to meet the condition and on the data and analyses contained in chapters 3 through 5. For favorable condition 2, the evaluation that the site does not have an adequate available local work force is based upon preliminary estimates that the repository project could result in a maximum 3 percent increase over projected baseline construction employment in the biconity area and about a 40 percent increase over projected baseline mining employment in Nye County, as presented in Section 5.4.1.1 of the final EA. Thus, the development of a repository would place significant demands on the local mining sector and moderate demands on the local construction sector. The DOE feels such estimated employment increases in a basic sector of the biconity economy are an appropriate basis for concluding that an adequate labor force would not be available.

Issue: Favorable condition 3

Four comments concerned favorable condition 3, "Projected net increases in employment and business sales, improved community services, and increased government revenues in the affected area." The DOE finding that the condition was present was found by one reviewer to be based on unsupportable estimates of the number of new jobs which would be created by the repository project. That commenter also noted that impacts to communities are based on

employment estimates. Three of the commenters stated that the DOE conclusion that tax revenues would rise cannot be deduced from information presented in the EA. Other criticisms were that the DOE is forced to include possible mitigation to achieve net project-induced revenues and improvements in community services, and that the Nevada tax base is extremely narrow, so that higher wage earnings are unlikely to lead to large revenue increases.

Response

While it is true that predictions of impacts on communities are sensitive to employment assumptions, the DOE believes that the direct and indirect employment estimates presented in Section 5.1.5 and elsewhere in the final EA are realistic, although preliminary. It is true that tax effects were not quantified in the EA. It is also true, however, that tax revenues are certain to rise as a result of wage payments to repository workers who are immigrants, and as a result of repository-related purchase of goods and services in the biconnty area. Thus, the conclusion that tax revenues will rise can be deduced from information in the EA.

Favorable condition 3 requires increases in government revenue in the affected area, but it does not require a positive net fiscal balance or that the increases be large. Thus, in light of the above discussion, the favorable condition is met with respect to local government revenue. The EA has been revised to clarify this point. The EA has also been revised to delete the dependence upon mitigation measures to achieve improved community services.

Issue: Favorable condition 4

The DOE received four comments on favorable condition 4, "No substantial disruption of primary sectors of the economy of the affected area." Two of the commenters questioned the conclusion by the DOE that the repository project would not significantly disrupt tourism. Another commenter suggested that the EA ignores potential negative effects on the State's mining sector that could occur if fewer workers than are needed immigrate to the biconnty area. The commenter suggests this could lead to a drain of workers from productive mining activities in other areas of the State, because of increased wages for repository mining workers. The final comment suggests that DOE findings are based upon the most easily passed tests of nonsignificance, that is, evaluation of the ability of the biconnty area to absorb socioeconomic impacts.

Response

The reasoning behind the DOE conclusion that the repository project would not significantly disrupt tourism is presented in sections 5.4.1.6 and 6.2.1.7.3 of the final EA. It is true that the EA does not address all of the distributional effects which would be associated with the potential increases in mining wages noted in Section 5.4.1.1 of the final EA. However, the evaluation of favorable condition 4 concerns the entire mining sector of the biconnty area (not the entire State), where overall effect of mining activity in the biconnty area would be positive. Regarding "... most easily passed tests of nonsignificance ..." the DOE believes that the biconnty area

is the most reasonable unit of analysis of effects upon primary sectors of the economy in southern Nevada.

Issue: Potentially adverse condition 1

The DOE received three comments on potentially adverse condition 1, "Potential for significant repository-related impacts on community services, housing supply and demand, and the finances of State and local government agencies in the affected area." The main point of these comments was that data were insufficient to determine whether this potentially adverse condition exists. One commenter also questioned the reliance upon mitigation to avoid negative impacts on fiscal conditions.

Response

Two of the main purposes of the EA are to make intersite comparisons and to identify potential impacts. To make the most effective use of its resources, the DOE conducted a coarse screening, so that detailed studies would not be performed on sites which ultimately would not be chosen for site characterization. The DOE's evaluation of this potentially adverse condition for the Yucca Mountain site was therefore limited to: (1) estimation of total population growth rates with the repository and (2) a qualitative evaluation of the ability of service providers to furnish, in a timely manner, services required by the increased population. By limiting the analysis of this potentially adverse condition to these two measures, the DOE was able to use readily available information and avoid the false impression of precision which could result from the combination of a more sophisticated analytical approach with insufficient data. Section 6.2.1.7.4 of the EA has been revised to discuss estimates of population growth rates, with a repository, for communities nearest the Yucca Mountain site. Population growth rates are manifested through increases in service and housing demands. Incremental values for the latter are shown for Nye and Clark counties in tables 5-50 and 5-51 of the final EA. These values do not indicate any major repository-related housing or community-services impacts on either county. Furthermore, sections 5.4.3 and 6.2.1.7.4 of the final EA have been revised to indicate that potential community services impacts would be mainly on county-wide service providers, which are more likely to have resources for managing growth than are town governments. Finally, the qualitative information presented in sections 3.6.3 and 5.4.3 of the final EA does not indicate the potential for major repository-related housing and community services impacts on communities in the biconity area.

Because the finding that potentially adverse condition 1 does not require assumption of mitigation, references to mitigating measures have been deleted from Section 6.2.1.7.4 of the final EA.

Issue: Potentially adverse condition 2

One comment was received on the DOE evaluation of potentially adverse condition 2, "Lack of an adequate labor force in the affected area." The commenter notes that the labor force issue was discussed under favorable condition 2, yet favorable condition 2 was found by the DOE to be unfavorable. This seeming contradiction was held to be an example of the quality of presentation of data and analysis in the draft EA.

Response

The DOE found that favorable condition 2 was "not present;" it did not find it "unfavorable." The title, "Favorable Conditions" of Section 6.2.1.7.3 of the final EA, along with the underscored criteria, establishes a framework for analysis of socioeconomic impacts. The criteria do not describe the results of the analysis.

Issue: Potentially adverse condition 3

The DOE received three comments on potentially adverse condition 3, "Need for repository-related purchase or acquisition of water rights, if such rights could have significant adverse impacts on the present or future development of the affected area." According to one commenter, Section 6.2.1.7.4 of the draft EA should be revised to provide a more accurate estimate of repository water use, identify existing offsite water rights, and identify and consider potential effects to local users. Another commenter said that the DOE should "... address potential impacts to ground-water resources that recharge municipal and agricultural water supplies in southern Nevada."

Response

The DOE estimate of repository water use has been changed, on the basis of a more detailed analysis, to 350 acre-feet per year. In addition, an inventory has been conducted of agricultural, industrial, municipal, and domestic water users in the Alkali Flat-Furnace Creek Ranch ground-water basin. Potential effects upon local users appear, on the basis of this information, to be negligible.

Taken literally, the second comment requests an analysis of the impacts of the project on recharge areas for the aquifers which supply water for agricultural and municipal uses in southern Nevada. Since the project will neither physically disturb recharge areas nor affect regional rainfall, there will be no effect on recharge. The comment could also be understood to request an evaluation of impacts on ground-water availability. The maximum annual water use by the repository represents only about 1.5 percent of the sustainable yield of the Amargosa Desert ground-water basin and about 0.8 percent of the combined sustainable yields of aquifers in the Amargosa and Pahrump valleys.

Issue: Potentially adverse condition 4

Two commenters addressed potentially adverse condition 4, "Potential for major disruptions of primary sectors of the economy of the affected area." One commenter suggests that there is insufficient information to conclude that there will be no disruption of the mining and tourism sectors of the southern Nevada economy and that there is evidence that both sectors could be adversely affected in a significant way. One commenter felt that population immigration to the Pahrump and Amargosa valleys could result in conversion of agricultural land to residential or commercial use and ultimately raise the cost of agricultural operations.

Response

While it is true that there is insufficient information to draw a final conclusion that there would be no impact, information available to date does not suggest that the repository is likely to have significant effects on tourism. It would significantly increase employment in mining and moderately increase employment in the construction sector. The DOE does not consider these potential employment increases to be a major disruption. The comment does not provide reasons for the assertion that "... both sectors could be adversely affected in a significant way." Section 3.6.3.3 of the draft EA noted that land in the Pahrump and Amargosa valleys has been undergoing conversion from agricultural to residential use for the last 10 years. Although it is possible that repository-related immigration could contribute to this trend, it would not, by itself, constitute a major disruption to the agricultural sector in the affected biconnty area.

Issue: Disqualifying condition

The DOE received five comments on the disqualifying condition, "A site shall be disqualified if repository construction, operation, or closure would significantly degrade the quality, or significantly reduce the quantity of water from major sources of offsite supplies presently suitable for human consumption or crop irrigation and such impacts cannot be compensated for, or mitigated by, reasonable measures."

One commenter asked that "... a more accurate estimate of repository water use ..." be provided and that the DOE identify and consider potential effects on local users. Another commenter stated that "... other industrial requirements ..." including dust control, are apparently not included in the calculation of average annual water demand associated with the repository.

One commenter stated that a reference cited in the draft EA (Young, 1972) indicates a historical decline of ground-water levels in Jackass Flats from pumpage at the Nevada Test Site (NTS); if projected into the future, this decline could impact regional water quantities and qualities.

Finally, one commenter stated that the EA does not demonstrate that "... long-term (10,000 years) storage of highly radioactive materials only slightly above the water table ..." will not eventually cause contamination of, and thereby degrade, water quality.

Response

The DOE estimate of repository water use has been changed, on the basis of a more detailed analysis, to 350 acre-feet per year. As noted above, an inventory of present uses in the area indicates that effects upon the availability of water to local users appear to be negligible and can certainly be mitigated. A variety of water uses, including dust control, were accounted for in the calculation of average annual repository water use. These uses are identified in Morales (1985).

Young (1972) had to make many assumptions due to the lack of information on the regional ground-water system in 1972. More recent reports (Waddell et al., 1984; Thordarson, 1983) indicate that his assumptions (e.g., no

recharge to the welded tuff aquifer) were incorrect. Although recharge is limited, it is not zero.

Finally, socioeconomic impacts are covered only in a preclosure guideline. All water resource contamination issues are covered in postclosure guidelines on geohydrology (Section 6.3.1.1 of the final EA) and performance assessment (Section 6.4.2 of the final EA). These postclosure guidelines deal with the long time periods referred to by the commenter.

Issue: Qualifying condition

The DOE received seven comments on the EA conclusion that the evidence does not support a finding that the site is not likely to meet the qualifying condition for socioeconomics. These commenters criticized the overall analysis by the DOE of the Guideline on Socioeconomic Impacts, saying that the conclusions of Chapter 6 are "... based on incomplete, inadequate and erroneous data, questionable data analysis methodologies, unsubstantiated assumptions, and seriously incomplete assessments."

Response

These comments are assumed to represent the reviewers' conclusions after considering a wide variety of specific issues. As such, they cannot be responded to directly. Instead, the reader is referred to the specific issues and responses presented above.

Issue: Mitigation

These commenters asked how the draft EA can state that all impacts can be mitigated or compensated when the DOE admits that it does not know what the impacts are.

Response

The discussion in Section 6.2.1.7.6 refers to the ability to offset any significant repository-induced adverse social or economic impacts in communities and surrounding regions by reasonable mitigation or compensation, under the financial and technical assistance provisions of the Nuclear Waste Policy Act (NWPA). Potentially significant impacts identified in Section 5.4 are not unlike those accompanying large construction projects in the past. In those cases, several factors have affected whether mitigation occurred. These include the experience of the project management, the local leaders, and the planning community in general in responding to such impacts; the availability of lead time; and the presence of monitoring programs or other communication between the project and the community during the project lifetime. These factors appear to be present in the case of the Yucca Mountain repository and so the preliminary conclusion has been drawn that it is reasonable to expect that mitigation of otherwise significant adverse impacts is possible.

It is also true that the impact analysis presented in Section 5.4 is preliminary and does not include any detailed investigation of community-specific impacts. In addition, the investigation of the potential for economic impacts arising from the public perception of a repository is

preliminary. Additional investigations on these subjects would be undertaken should the Yucca Mountain site be approved for site characterization.

Issue: General opinion

The DOE received six comments from the general public which expressed various opinions on the proposed Yucca Mountain repository project but did not concern specific data, analyses, or conclusions presented in the EA. Two of the commenters expressed support for the project, accompanied by concern that "... boom and bust ..." cycles might occur. One stated that economic development based upon nuclear waste will have "... devastating effects on future generations ...", while another expressed doubt that "... other industries will find this area desirable." Finally, one commenter noted that if a railroad were constructed for the project, it could be used for other purposes.

Response

The DOE has noted these comments and will continue its exchange of information with residents of the affected area.

Issue: General comments

Eleven comments were received which expressed concern about the general quality of the socioeconomic impact analysis in the EA. Most of these remarks were located in introductory or summary sections of comment documents.

Response

Because each of the introductory or concluding remarks corresponded to specific issues presented and responded to in sections C.7.4.1 through C.7.4.5, the reader is referred to those portions of this Appendix.

Issue: Restriction to Clark and Nye counties

The DOE received 24 comments which questioned the restriction of the socioeconomic impact analysis to Clark and Nye counties. In particular, it was asked why Lincoln County was excluded, since it would be traversed by the most likely nuclear waste rail transportation route. Other commenters stated that Lincoln County, the City of Caliente, and the town of Alamo should be included in post-EA studies, including preparation of an Environmental Impact Statement.

Response

If a repository were located at Yucca Mountain, social and economic impacts would occur in areas where repository-related expenditures would be made and where the immigrating repository-related work force would reside. To the extent that resources are available at competitive prices, it is expected that the majority of repository-related expenditures would be made in Nye County, where the site is located, and in neighboring Clark County, the major metropolitan area in southern Nevada. The NTS, adjacent to the Yucca Mountain site in Nye County, employs DOE and contractor personnel with

skills similar to the construction and mining skills which would be required by the repository work force. Historical settlement patterns of workers at the NTS provide a reasonable indication of where repository workers and their families would settle. Recent settlement patterns of these NTS workers were determined through an analysis of the ZIP codes reported by NTS workers. This analysis, the results of which are summarized in Table 5-26 of the final EA (Table 5-29 of the draft EA), indicates that most (96 percent) of the NTS workers reported ZIP codes in Nye and Clark counties in 1984. The socio-economic analyses presented in Section 5.4 of the EA focus on this biconity area, where almost all of the Yucca Mountain work force would be expected to settle. However, since the data summarized in Table 5-26 of the final EA indicate that about 1.5 percent of the recent NTS workers also reported ZIP codes in other Nevada counties (Douglas, Lander, Lincoln, Lyon and White Pine) and Carson City (a consolidated municipality), the DOE intends to consider a larger geographic area in future studies if the Yucca Mountain site is approved for site characterization.

See Section C.7.4.3 of this Appendix for other comments regarding Lincoln County.

Issue: Moapa Indians

A single commenter noted that the EA ignores impacts on the Moapa Indian Reservation which lies along potential shipping corridors for radioactive waste.

Response

Because Native Americans in southern Nevada have not been certified as affected tribes within the meaning of Section 2(2)(B) of the NHPA (1983), they have not been singled out for special analysis in the EA. Furthermore, American Indian reservations, being relatively distant (e.g., about 250 kilometers or 155 miles for the Moapa Paiute Indian Reservation; about 161 kilometers or 100 miles for the Las Vegas Tribe of the Paiute Indians; about 322 to 467 kilometers or 200 to 290 miles for the Yomba Shoshone Indian Reservation; and about 443 kilometers or 275 miles for the Duckwater Indian Reservation) from the Yucca Mountain site, are not expected to be affected significantly by the immigration of repository-related workers and their dependents. However, specific note was made in Section 5.4.4.2 of the EA of the potential for impacts on Native American cultures from transportation activities. This aspect will receive appropriately detailed treatment in research to be performed if the Yucca Mountain site is approved for site characterization. The potential impacts of the repository project on Native Americans who live outside of reservations (as well as on other cultural groups in southern Nevada) will also be included in the detailed, community-level data gathering and analysis to be undertaken later. Note that all mileages given above are measured along the existing road network.

Issue: Lack of community-specific data and analysis

Two commenters noted that the EA lacks community-specific data and analyses. It was suggested that as a minimum, the EA should have used existing data on boom-town phenomena in the modern American West to provide

some indication of the potential magnitude of the impact of repository siting.

Response

The various conditions of the Socioeconomic Impacts guideline were evaluated at the level most appropriate given the overall evaluation philosophy and availability of information. For example, it was most appropriate to evaluate employment and income impacts at the county and regional levels, since (1) a substantial portion of the potential labor supply for the repository would come from southern Nevada and (2) community-specific employment data were unavailable. On the other hand, some community-specific information was presented and analyzed (see sections 3.6.3 and 5.4.3 of the EA). A comprehensive review of the boom-town literature was not considered appropriate for the EA because (1) the boom-town literature is not relevant for the entire affected area, as noted in Section 3.6.4 of the EA; and (2) a focus on boom-town literature presupposes that the repository would also cause boom-town conditions, and this is by no means certain, given the planning and mitigation procedures provided in the Nuclear Waste Policy Act of 1982.

Issue: Safety assumptions

The introduction to Section 5.4 of the draft EA states that "... it has been assumed that safety questions about waste transportation and disposal would be resolved before the repository would be constructed" and two commenters stated that to dismiss such issues out-of-hand eliminates major potential influences on socioeconomic conditions that should be addressed in the EA.

Response

The Department of Transportation (DOT) has regulatory responsibility for safety in the transportation of all hazardous materials, including radioactive waste. This responsibility extends to all modes of transportation that would be considered for shipping waste to the repository. The Nuclear Waste Policy Act requires the DOE to comply with the DOT regulations.

The Nuclear Regulatory Commission has responsibility for authorizing licenses to construct a repository, to receive and possess spent nuclear fuel and high-level waste in such a repository, and to close and decommission a repository.

Regulations by these Federal agencies will ensure that safety questions are resolved before transportation of radioactive waste or construction of the repository. It is beyond the scope of the socioeconomic section to demonstrate the adequacy of safety measures required by these regulations.

Issue: Mitigation needs

Two commenters noted that applying the rule of indemnifying local residents of risks to their economic well-being would require that mitigation actions be taken to provide the State of Nevada and its citizens with an

"... insurance policy ..." against these general risks. One mitigating measure suggested by the commenter was to use van pools or buses for employees to decrease the accident potential.

Response

The DOE believes that the financial assistance provisions contained in the Nuclear Waste Policy Act of 1982 demonstrate the Federal Government's commitment to impact mitigation. Because the DOE will not recommend a site for repository development until the early 1990s, specific impact mitigation strategies (fiscal or other) have not yet been developed. The development of such specific mitigation strategies will be based on further impact studies conducted by both the DOE and the State if the Yucca Mountain site is approved for site characterization, and on impact mitigation agreements negotiated between the DOE and the State pursuant to Section 116(c)(2)(B) of the Nuclear Waste Policy Act.

Issue: Transportation effects analysis

Five commenters noted that there are only a limited number of transportation routes within the State that would serve a repository at Yucca Mountain. These comments stated that there is no reason why each community along these routes should not be included in the analysis of social (as well as socioeconomic) conditions; failure to consider transportation effects generically or to use a simulation approach is a major shortcoming.

Response

Because actual transportation routes have not yet been identified, communities which could be affected by transportation have not yet been identified. The focus of the DOE's socioeconomic analysis in the EA was the area where repository workers would be expected to settle. To consider transportation-related impacts generically would not be meaningful, since the potential impacts could differ significantly among communities along a route. An analysis of transportation-related socioeconomic impacts will be conducted once actual transportation routes have been identified.

Issue: Closure and decommissioning

One commenter noted that the analysis of the socioeconomic impacts of the repository should include a discussion of the impacts during and following closure and decommissioning.

Response

Socioeconomic impacts during and following closure and decommissioning are discussed briefly in the final EA: Tables 5-5a and 5-5b contain direct and indirect employment estimates for decommissioning; tables 5-47 and 5-48 show population estimates for decommissioning; and tables 5-47, 5-48, 5-50, and 5-51 show population and community services estimates, for decommissioning. In general, however, the socioeconomic impacts of a repository would be greatest during construction and operation. Expanding the analysis to include more information on closure and decommissioning would not affect the conclusions of the socioeconomic impact analysis for the purpose of determining site suitability.

Issue: Special Effects

Two commenters maintained that the final EA should begin to identify major "special effects" associated with all socioeconomic and transportation subcategories discussed in sections 5.3 and 5.4 of the draft EA.

Response

Section 5.4 defines "special effects" as those stemming from concerns about radioactive material. Changes in expectations can have economic consequences as well as broader, socioeconomic consequences if they result in changes in behavior of people. Section 5.4.1.4 of the draft EA considers the economic consequences of public perceptions of the presence of a repository on tourism. Special effects on social structure and social organization are considered in Section 5.4.4.1.2. Further research on attitudes and perceptions would be undertaken should the Yucca Mountain site be approved for site characterization.

C.7.4.1 Population density and distribution

This category addresses the effects of the proposed action on population density and distribution in the affected area. The 16 comments received are divided into two issues: (1) Immigrant Settlement Patterns and (2) Population Increases.

Issue: Immigrant settlement patterns

Nine comments were received; these concerned the use of residence patterns of Nevada Test Site (NTS) employees. These fell under two topics: forecasting settlement patterns and assessment of population changes.

Forecasting settlement patterns. The use of NTS settlement patterns as the basis for projecting likely settlement patterns for repository-related workers was felt to be speculative. A more detailed, sector-by-sector analysis of settlement patterns before drawing conclusions in the final Environmental Assessment (EA) was requested. It was also questioned whether it was true, as shown in Table 5-29 of the draft EA (Settlement patterns of Nevada Test Site employees), that some employees live in other Nevada counties and in California.

Several other commenters indicated that there are at least two reasons to doubt that 83 and 13 percent of the project-related immigrants would settle in Clark and Nye counties, respectively: (1) commuting times to the Yucca Mountain site will be about 1.45 hours per day longer than times to the NTS; and (2) this additional commuting time will make Amargosa, Beatty, and Pahrump more attractive. Finally, it was pointed out that the settlement pattern distribution assumed in the EA will become even more doubtful in the later phases of the project as local communities adjust to the impacts created by the project.

Response. Recent settlement patterns of workers at the NTS (which is adjacent to the Yucca Mountain site) constitute the best available data on the likely settlement pattern of repository-related workers. NTS workers include construction and mining workers. Contrary to the suggestion of the comment, use of other available means of estimating likely settlement patterns would be speculative. Additional analysis of the NTS work force and of worker settlement patterns on other projects will be an important part of studies to be performed if the Yucca Mountain site is approved for site characterization. These will lead to additional information regarding the intracounty settlement of the work force as well as a reevaluation of inter-county settlement.

The results of future studies of the impacts of a repository on local communities will be sensitive to the assumption about intracounty worker settlement patterns. Thus, the settlement behavior of workers currently employed near the Yucca Mountain site will be the subject of further investigation. It is also true that settlement patterns may change over time. This will be an important consideration in forecasting community-level settlement patterns and preparing an analysis of impacts on local communities.

The comment correctly notes that according to data on recent settlement patterns of workers employed at the NTS, it is likely that some repository workers would commute to the Yucca Mountain site from other Nevada counties and from California.

With regard to settlement patterns in Clark and Nye counties, both factors cited have been taken into account in the analysis in the final EA. The data shown in Table 5-29 of the draft EA (Settlement patterns of Nevada Test Site employees) represent the best available information on likely settlement patterns of project employees at Yucca Mountain. The possibility that workers employed in Mercury would be more likely to live in Clark County than would workers employed in the northern areas of the NTS which are further from Clark County (see Figure 3-21, Bicounty area surrounding the Yucca Mountain site, of the EA) was considered in compiling the settlement pattern data shown in the table. The fraction of workers who reside in Nye County does not appear to be sensitive to the location of their work area within the NTS.

Assessment of population changes. Other commenters noted that the final EA should contain a detailed assessment of population changes in local communities including Amargosa Valley, Beatty, Pahrump, Tonopah, Las Vegas, North Las Vegas, Henderson, Boulder City, Caliente, and the remaining areas of Clark, Nye, and Lincoln counties.

Response. As was discussed in Section C.7.4 of this Appendix, the evaluation of the Yucca Mountain site against potentially adverse condition 1 included estimation of total population (i.e., baseline plus that due to the repository) growth rates in individual communities nearest the repository location. Because baseline population data on most of the smaller communities, especially those nearest the Yucca Mountain site, were limited, a detailed population growth assessment was not possible. Instead, it was assumed that the settlement patterns presented in Table 5-29 (Settlement patterns of Nevada Test Site employees) of the draft EA (Table 5-26 of the final EA) would be valid in the future and that individual communities would

retain their recent shares of total county population. Section 6.2.1.7.4 of the EA has been revised to present community population growth forecasts for the peak year of expected population immigration.

Issue: Population Increases

Seven comments were received on this issue; all were related to various aspects of the methodology used in the calculation and the examination of the effects of future population increases. One commenter requested the sources of the information presented in footnotes a, b, and c to Table 5-49 (Projected maximum total population increase for Clark and Nye Counties for vertical emplacement) of the draft EA. The same commenter asked why a situation in which all employees would come from and return to areas other than Nye and Clark counties be considered a conservative assumption. Further, it was questioned why this situation would be examined at all, given the experience of recent NTS worker residence patterns. Some commenters expressed a general concern over projected levels of population growth in the affected area, while others expressed concern about the effects of even a small population increase on the small communities in the affected area. For example, it was noted that the population of Pahrump could reach 100,000 by the year 2000. In the long run, it was felt that the proposed project will make areas such as Pahrump Valley into detached suburbs of the Las Vegas metropolitan area.

Response

Table 5-47 (Maximum population increase for vertical emplacement and bicounty population forecast with and without the repository) of the final EA indicates that the repository project would increase the bicounty population by about 16,100 in 1998 and about 14,100 in the year 2000. In the absence of the project, Nye County population is expected to reach 42,408 by the year 2000 (Table 3-15 (Population of Nye County, 1970-2000) in the final EA). Even if all project-related immigrants were to settle in Nye County, the county population would still be less than 100,000 in the year 2000.

Footnote "a" in tables 5-47 and 5-48 of the final EA (tables 5-49 and 5-50 of the draft EA) presents assumptions about the employment multiplier and the number of dependents per worker. The employment multiplier used in this analysis is discussed in Section C.7.4.2 of this Appendix. The assumptions regarding dependents per worker were taken from U.S. Department of Energy, Environmental Aspects of Commercial Radioactive Waste Management (DOE/ET-0029) Volume 3, Appendix C, Washington, D.C. (1979). The EA has been revised to acknowledge this source. Footnote "b" presents assumptions about settlement patterns of repository-related immigrants. The percentages for Nye and Clark counties were obtained from NTS worker residence pattern data (see Table 5-26 of the final EA). A new footnote "c" was added to clarify that population growth rates are calculated from the previous year. Footnote "d" presents the projected 1992 population of Clark and Nye counties without a repository (i.e., the baseline population). The EA has been revised to clarify that this value was obtained from a linear interpolation of the population projections presented in tables 3-15 and 3-16.

The assumption that all employees would come from and return to areas other than Nye and Clark counties is considered conservative because it overstates the likely upward (or downward) responses of bicounty population to changes in project labor requirements. Any other population distribution assumption would lead to lower estimates of some types of impacts. Using the conservative immigration assumption enabled the DOE to estimate an upper bound for community services requirements.

The concern regarding small communities is valid in that the same increment in population in a small community will represent a greater fractional population increase than in a large one. In the quantitative analysis of community-services impacts, service requirements were assumed to be proportional to population, and the percentage increase in service requirements would be greater for the smaller communities. Future community-level studies will address this issue.

Population forecasts for Nye County prepared by the State of Nevada (Table 3-15 of the final EA) do not indicate that the entire county is expected to have a population of 100,000 by the year 2000. Therefore, it is very unlikely that the population of Pahrump alone would reach 100,000.

C.7.4.2 Economic conditions

This category addresses those sections of the Environmental Assessment (EA) which provide the economic impact analysis for the proposed action of siting a repository at Yucca Mountain. The U.S. Department of Energy (DOE) received 69 comments in this category; these comments have been organized into six issues: (1) Employment Analysis, (2) Prices and Income, (3) Materials Estimates and Impacts, (4) Repository Costs, (5) Effects on Economic Development, and (6) Impacts on Tourism.

Issue: Employment analysis

The DOE received 32 comments on the labor analysis presented in Section 5.4.1.1 of the draft EA. Among the topics covered by these comments were: indirect employment multiplier, employment fluctuations, wage rate effects, and effects on the mining industry.

Indirect employment multiplier. Commenters requested that the EA present details on the methods used to generate the employment multiplier of 1.54. Also, they suggested that the possibility of spillover support employment in Clark County from base employment in Nye County should be considered. In a related comment, it was observed that it is possible that job opportunities at Yucca Mountain would "... drain employees from the labor supplies which characterize neighboring counties, creating a net outmigration and decline in local economies."

Response. The indirect employment multiplier of 1.54 was estimated using data presented in White et al. (1975). To briefly summarize, the indirect employment multiplier was estimated as the average ratio of nonbasic (i.e., indirect) to basic (i.e., direct) employment in the Clark County area from 1961 to 1974. The annual ratio was fairly constant over that interval. Basic employment was defined as the combined total employment of the resort industry, the Nevada Test Site (NTS), Nellis Air Force Base, and part of the manufacturing sector. Nonbasic employment was defined as total employment in the Las Vegas Standard Metropolitan Statistical Area minus basic employment. (See White et al., 1975, for a more rigorous definition.) Section 5.4.1.1 of the EA has been revised to document more thoroughly the derivation of this employment multiplier.

Net outmigration of workers could lead to economic decline in two ways. First, unemployed workers could leave an area. Even though these workers do not earn income, they generate income for others through their expenditures (e.g., food and shelter). The result would be a reduction of economic activity in the support sector. This type of impact is not considered significant because such workers are likely to leave the area in search of work independently of the repository project. Second, local economic decline could occur if outmigration of workers resulted from upward pressure on regional wage levels for certain skills and if such increases led to the reduction of marginal business activity. Upward pressure on wages, if any, would most likely occur in the mining and construction sectors (Section 5.4.1.1 of the EA). Reduction in marginal business activity in these sectors is as likely within the biconity area as outside of it. It is the possibility of an increase in the regional wage rate and not the migration of workers per se that introduces the possibility of such a geographic redistribution of economic activity.

The proximity of labor supply in California, Utah, and other western states would reduce upward pressure of project-related labor demand on regional wages. The net effect of the project on wages would depend on economic conditions in those areas in the early 1990s.

Employment fluctuations. Several other commenters stated that the draft EA assumes that "... all markets work with perfect efficiency ..." and that the required work force will appear at just the right time. Commenters suggested that it is more likely that "... there will be significant unemployment, social, and fiscal impacts--even during the boom phase of the project." Therefore, the usefulness of the socioeconomic evaluation was found to be limited by the assumption that workers enter and leave the southern Nevada area as project needs rise and fall. In addition, it was felt that the EA consistently ignores the declines in employment which occur as the operation moves from construction to operations and from operations to closure. Similarly, the construction employment baseline value with which labor demand is compared was found to be misleading because of the large fluctuations which occur in construction employment.

Response. It is as reasonable to expect that too many workers will enter the area in response to project-related job opportunities as it is to expect that too few workers will enter the area at the onset of the project.

An important factor in determining which situation prevails is the level of information available about project-related opportunities. Over or under-supply of workers would result from unreasonable expectations about those opportunities. At present, it is not known what quality or quantity of information about job opportunities would be available at the outset of the project. The possibility of unemployment and associated social and fiscal impacts would be considered as part of future investigations of labor market impacts of the project. Public announcements of the number and timing of job opportunities may be considered as an action that the DOE and its contractors could take to avoid the adverse impact suggested by the comment.

It is true that forecasts of project-related population growth are based on the conservative assumption that all employees would come from and return to areas other than Clark and Nye counties and that the number of immigrants varies with the project labor requirements. As stated in Section 5.4.2 of the EA, this results in an overstatement of the likely fluctuation of biconity population in response to changes in project labor requirements. Similarly, it leads to an overstatement of the fluctuation over time of requirements for community services. Given the preliminary nature of the data, the use of this extreme assumption regarding population fluctuation is appropriate. The intent is to identify adverse impacts which may be important in distinguishing among sites or in identifying important topics for subsequent, more detailed investigation.

It is consistently recognized in the draft EA that declines in employment would occur as part of the repository project (e.g., Figure 5-7a of the final EA (Number of direct workers over time for vertical emplacement) and the text of Section 5.4.1.1). It is true that while the impact of project-related decline is discussed in the EA, the socioeconomic analysis focuses attention on the impacts of project-related growth. The focus of the socioeconomic analysis tends to correspond to the timing of the impact, with the greatest attention given to more immediate impacts and less attention given to impacts which would occur at later stages of the project. With both growth and decline, negative impacts tend to be associated with the difficulty of adjusting to change.

The fluctuations in historical construction employment (in Nye County) was noted in Section C.4.1.5.2 of this Appendix. These may indicate that the uncertainty surrounding baseline construction employment projections is probably greater than that surrounding projections for other sectors.

Wage rate effects. Several commenters stated that two statements in Section 5.4.1.1 of the draft EA are seemingly inconsistent: "... there might be an increase of wages and salaries to induce workers having mining and construction skills to relocate to the area ..." and "... potential increases in wages and salaries in the biconity area could be mitigated by the immigration of skilled workers from other areas ..." Further, the commenters stated that the income analysis contained in the EA was based upon "... fairly low assumptions of average annual wages, particularly for construction and operations ..." and that the EA should contain information on construction and operating workers by skill mix, based on union scale, since Davis-Bacon rules require payment of prevailing union wages on Federal projects.

Response. The statements in the EA are consistent. The immigration of workers is evidence of either unemployment in neighboring areas or of wage increases that cause a geographic reallocation of the existing work force. "Mitigation" was not used in its usual sense here. The purpose of its use was to emphasize the relationship between the likely project-induced escalation of wages, if any, and the elasticity of supply of workers from surrounding areas. The greater the elasticity of supply of workers from outside the area, the lesser the increase in wages that would be required to meet project labor requirements, other things being equal. This word, however, has been deleted in the final EA.

The commenter is correct in noting that the wage for construction and operations workers shown in the draft EA appears low. This figure was revised upward in the cited reference subsequent to its use in the draft EA. Although the results of the analysis in the EA are not sensitive to this adjustment in the average wage, the final EA has been revised to show \$36,200 per direct worker, based on annual wages currently paid to workers at the NTS, under the Davis-Bacon Act, and as cited in McBrien and Jones (1984).

Effects on the mining industry. A last commenter questioned the effect that the Yucca Mountain project demand for mining-related workers would have on the viability of the traditional mining industry in Nevada.

Response. The repository project would have two potential effects. The first effect concerns the total level of mining activity. Growth of the mining sector has traditionally contributed to the overall economic growth of the region. Similarly, project-related growth in mining activity would contribute to regional economic growth.

The second potential effect concerns the distribution of activities within the mining industry. As noted in Section 5.4.1.1 of the EA, project-related demand for miners may increase the regional wages of miners. The amount of such an increase, if any, would depend on the condition of minerals markets at the time and the availability of mining workers from outside Nevada. Unlike mining workers, owners of mines would be negatively impacted by wage increases. Mines that are marginally profitable in the absence of the project could become unprofitable and close in the event of sufficiently large wage increases.

Issue: Prices and income

The DOE received four comments on the following topics: repository influence on regional prices and income, and potential for a recession.

Repository influence on regional prices and income. Several commenters stated that not only are wages likely to increase in certain sectors, but the influx of workers in a small community will increase demand for goods and services, thereby driving prices upward.

In addition, the same commenters noted that the draft EA contains no discussion of what portion of the total wage estimates in tables 5-47

(Potential annual wage expenditures associated with vertical emplacement) and 5-48 (Potential annual wage expenditures associated with horizontal emplacement) of the draft EA would actually go to workers and contractors outside the bicoounty region. Also, there is no provision for encouraging or requiring repository contractors to hire or buy locally.

Response. It is not obvious that worker influx would cause the prices of goods and services in communities to increase. Unlike the experience of some small towns, the smaller towns surrounding the Yucca Mountain site are not the only potential recipients of immigrants. Rather, workers could live in the urban part of Clark County, as demonstrated by the historical settlement patterns presented in Table 5-26 (Settlement patterns of Nevada Test Site employees) of the final EA. The presence of this alternative significantly reduces the potential for significant increases in wages in the smaller towns. Nevertheless, the potential for increased community price levels will be the subject of additional research as part of planned investigations of the socioeconomic impacts of the repository project.

The wage estimates presented in the cited tables apply only to those employees of the project who would be assigned to work in southern Nevada. Such wages would only be spent outside the region to the extent that workers either commuted from, or sent a portion of their incomes to, outside areas. The project includes no provision favoring local hiring or purchasing. Decisions on whether to hire or purchase locally in the absence of DOE restrictions would be sensitive to local economic conditions (e.g., the prices and availability of goods and services from local sources as compared with sources outside the region).

Potential for a recession. In stating that periods when repository-related employment decreases "... would probably resemble similar periods of slower economic growth that the bicoounty region has experienced during previous fluctuations in the mining and construction industries ..." the DOE is in effect admitting that it plans to cause three recessions.

Response. A fluctuation in two employment sectors would not, in general, be classified as a recession. There is no short and simple definition of an economic recession, as officially measured by the National Bureau of Economic Research. However, the contraction phase of the business cycle (i.e., a recession) clearly represents a change in aggregate economic activity, not a single factor such as employment in one or two sectors. It is for this reason that the Bureau must collect a number of comprehensive economic series, and construct and evaluate a variety of indicators (e.g., composite and diffusion indices, leading and lagging indicators) (Moore, 1983) before a contraction phase in the business cycle can be ascertained.

Issue: Materials estimates and impacts

The DOE received four comments on the EA estimates of project materials requirements and the impacts of materials acquisition on the availability and price of local materials such as cement and aggregate.

Response

Information necessary for conducting an analysis of the effects of the project upon local materials markets was unavailable during preparation of the EA. A detailed analysis of these potential impacts would be conducted if the Yucca Mountain site is approved for site characterization.

Issue: Repository costs

The DOE received one comment requesting details of the methods used to estimate the cost of the repository.

Response

The methods by which repository costs were estimated have been described in MacDougall (1985). Footnote "a" in Table 5-44 (Preliminary cost estimates for the Yucca Mountain repository assuming vertical emplacement) in the EA has been revised to provide this new reference.

Issue: Effects on economic development

The DOE received two comments on the long-term effects of the repository project on economic development in the bicoounty area. These expressed concern that a 50,000-acre withdrawal of land for the repository could seriously affect the development potential of the Town of Amargosa Valley.

Response

The 50,000-acre withdrawal number is an error; the correct value for the acreage to be withdrawn is 5,000. As part of more detailed investigations of the impacts of a repository on communities, it will be important to develop a clear understanding of their planned development; these studies will be conducted if the Yucca Mountain site is approved for site characterization. Based on present information, it is unreasonable to expect that the presence of a repository would inhibit the growth of Amargosa Valley. Instead, it is more reasonable to expect that a repository would contribute to its growth.

Issue: Impacts on tourism

The DOE received 38 comments on the EA discussion of potential impacts of the repository project on the tourist industry in southern Nevada. The major topics of these comments included: adequacy of the analyses, historical bases for analyses, effects of media coverage, usefulness of weapons-testing tourism effects, effects on recreation sites, and determination of damages and compensation.

Adequacy of analyses. Several commenters stressed that potential impacts on tourism are of extreme importance to Clark County and that a substantive analysis which would examine the influence of the transporting of waste and the siting of the repository on tourism should be included in the EA.

In addition, it was felt that the DOE tourism analysis does not differentiate between short-term, crisis-related events and the implications of a project that will be ongoing for 10,000 years.

Response. The EA recognizes the importance of the tourism industry to State and local economies. Section 5.4.1.6 of the EA presents the results of a substantive, although preliminary, analysis of the possibility that a repository might affect visitors' perception of Las Vegas and whether this would harm tourism. The EA explicitly states that the "Research to date concerning the potential effect of repository operation on tourism is inconclusive; therefore, further investigation has been planned." As more specific information becomes available about repository-system design, actual transportation routes, the mode of transportation, and the appearance of the transportation activity to tourists, this information will be used to develop a better understanding of the potential effect on tourist perceptions of a repository and the effect of a repository on tourism. Section 5.4.1.6 of the draft EA has been revised to provide more details about the preliminary analyses performed by Science Applications International Corporation (SAIC).

The analysis discussed in the draft EA refers to impacts of repository operation. It does not address the impacts of possible accidents. Information about the observable effects of historical short-term, crisis-related events is used only to draw inferences about the potential future implications of the long-term operation of a repository on southern Nevada tourism. The purpose of the information on short-term, crisis-related events is to place an upper bound on the potential effects of long-term operation. The project, if interpreted to mean construction and operation of a repository, would not be ongoing for 10,000 years. Rather, all activities are expected to be completed in about 100 years (if the full retrievability period is used).

Historical bases for analyses. The DOE received comments which maintained that information on such historical cases as the major hotel fires and the Three Mile Island accident cannot be used to draw conclusions relative to the effect of the repository on the Nevada tourism industry. In addition, it was stated that the reference to the Las Vegas hotel fires in Section 5.4.1.6 of the draft EA is "inaccurate" without a discussion of the measures that were taken to mitigate the potential concerns of the tourist population.

Response. Information about historical cases is a reasonable basis for preliminary conclusions about the future effects of repository operation on tourism. The section of the SAIC report (1985), entitled "Case Selection" describes the criteria used to select cases for study. In general, cases were selected to investigate the presence of effects on tourism of (1) the siting of nuclear facilities, (2) high levels of media attention regarding potential safety hazards, and (3) the presence of nuclear testing in the Las Vegas area.

The reference to the Las Vegas hotel fires is accurate. However, information about such measures would contribute significantly to the understanding of the alternative means of mitigating potentially adverse effects of highly publicized concerns about safety hazards. This information will be taken into account in future, more detailed investigations of the potential impacts of a repository on the tourist industry.

Effects of media coverage. Other comments received indicated a concern that the image of Nevada would be tarnished by a "... nuclear waste image." In addition, the draft EA text was perceived to state that losses in tourism and gaming were considered certain. According to the commenters, the DOE tourism analysis seems to have the foregone conclusion that tourists will perceive nuclear waste as something that need not be avoided. Tourist perceptions should be evaluated in more detail, since a tourism- and recreation-based economy could be seriously harmed by an accident involving high-level radioactive material and resulting in media coverage. Some tourists may never come here after hearing that Nevada is to be the site of the first high-level radioactive waste repository.

Response. The purpose of past and ongoing research on the potential impact of a repository on tourism is to test such prior beliefs as this. As described in Section 5.4.1.6 of the EA, the available evidence supports the preliminary conclusion that the repository would not change the total appeal of the Las Vegas area to tourists. That evidence is inconsistent with the view that losses are certain. However, research to date concerning the potential effect of repository operation on tourism is not conclusive; therefore, further investigation has been planned.

The analysis of potential impacts on tourism begins with the recognition that tourists may perceive nuclear waste as being unattractive and unsafe regardless of the opinions of informed experts. For this reason, cases of highly-publicized concerns about safety were investigated to learn the effects of such perception on tourism. As explained in the EA, those cases included the Three Mile Island incident and the Las Vegas hotel fires. The analysis of data on tourism levels surrounding those events does not reveal that the concerns resulted in sustained declines in tourism levels. This may either be because the relationship between publicly stated perception and behavior is very weak or because the empirical tests used to seek evidence of a relationship are not strong enough. The available evidence does not constitute proof. Thus, as stated in the EA, more research is planned.

The possibility that media coverage alone could affect the tourist industry has been addressed in Section 5.4.1.6 of the EA. The preliminary result is that such coverage would not significantly affect the appeal of the area to tourists. However, research to date concerning the potential effect of repository operation on tourism is not conclusive; therefore, further investigation has been planned. An assessment of tourists' potential perceptions of repository-related activity, which will depend upon presently unavailable detailed information about repository design characteristics (including its physical appearance), will be an important part of those studies.

Usefulness of weapons-testing tourism effects. Another commenter stated that it is questionable whether information about the past effect of weapons testing on tourism is useful for drawing conclusions about the tourism effects of a future repository project.

Response. It is true that there is a real difference between controlled, isolated nuclear-weapons testing and the transport of high-level radioactive waste. It is also true that one potential means by which the

presence of a repository could affect tourism is through an adverse effect on the aesthetic appeal of Las Vegas and surrounding tourist attractions that extend beyond safety concerns and the area associated with the nuclear nature of the waste materials. Time-series econometric analyses of the relationships between gaming revenues and the number and timing of weapons tests were conducted to test the premise that if the radioactive threat posed by the Nevada Test Site were very great, then gaming revenues would be negatively related to the frequency of occurrence of tests over time, after taking into account variation explained by fluctuations in the level of economic activity (indicated by gross national product).

Effects on recreation sites. In a specific question, one commenter asked what effect the repository project will have on various recreational sites in Lincoln County.

Response. It is not possible, with information now available, to predict what impacts on tourism, if any, would result from high-level radioactive waste transport. Further analyses of this issue will be conducted if the Yucca Mountain site is approved for site characterization.

Determination of damages and compensation. A last commenter asked what measures will be taken to determine damages and to compensate the Henderson tourism-dependent population if an accident or the existence of the repository affects local tourism.

Response. Such information is not available. The EA states the preliminary conclusion that the repository would not change the total aesthetic appeal for the Las Vegas area, which includes Henderson. The economic consequences of an accident of a magnitude greater than historically experienced by the area are not considered in the EA.

Further investigations of the effect of repository-related activity on tourism are planned. The preliminary conclusion will be reevaluated to take into account additional information about the design and appearance of the repository system and tourists' potential perceptions of the repository-related activity as it becomes available. These investigations may consider alternative means of mitigating unlikely economic impacts of the activity.

C.7.4.3 Community services

Increased population growth as a result of the proposed action will result in an increase in the demand for local, state, and regional public services. The U.S. Department of Energy (DOE) received 55 comments on the assessment of project impacts on community services. These have been divided into issues according to the type of community services discussed: (1) Housing, (2) Nye County Education, (3) Water Supply, (4) Waste-water Treatment Facilities, (5) Public Safety Services, (6) Medical Services, (7) Mitigation, (8) Lincoln County or Statewide Impacts, (9) Transportation Systems, and (10) General Comments.

Issue: Housing

The DOE received three comments on the analysis of the impacts of the project on housing. All three called for a more detailed discussion of the housing market in the affected area, including housing preferences of immigrating workers and their dependents, impacts on housing prices, and impacts on the local banking industry.

Response

The literature on housing preferences of construction workers and other immigrants to sites of major projects is fairly extensive. It would have been possible to present historical information on the types, tenure, and price of housing preferred by workers on other projects. There would have remained, however, a serious question as to the applicability of these data to the proposed repository project. Likely housing preferences and prices can be projected only by an in-depth analysis which takes into account many community-specific factors, data for which were unavailable during preparation of the Environmental Assessment (EA). Because of the importance of housing impacts, additional research on housing market conditions in the affected area will be conducted as part of post-EA studies, if the Yucca Mountain site is approved for site characterization.

Issue: Nye County education

The DOE received two comments on the impacts of the repository project on the Nye County School District. The commenter noted that the incremental requirement for schools and teachers, as forecast in tables 5-52 (Incremental service requirements associated with the location of a repository at Yucca Mountain -- vertical emplacement) and 5-53 (Incremental service requirements associated with the location of a repository at Yucca Mountain -- horizontal emplacement) of the draft EA, would rise and fall during different phases of the project. It was asked whether schools would have to be built and closed and whether teachers would have to be hired and laid off.

Response

Tables 5-52 and 5-53 of the draft EA (tables 5-50 and 5-51 of the final EA) show the incremental number of schools and teachers needed to accommodate project-induced population growth during each period of the project. It is likely that the new schools built during 1993-1998 would serve the community throughout the remainder of the project. Any excess capacity during years when incremental demand is lower could be used to respond to baseline growth in demand. It is true that there may be a need to lay off teachers after the operations period. However, since this period would last for 50 years, there would be ample time for the Nye County School District to plan for such changes.

Issue: Water supply

The DOE received nine comments on potential impacts of the project on water supply in the affected area. These have been divided into two topics: impacts of ground-water use, and projection of regional needs.

Impacts of ground-water use. Two commenters expressed concern that the repository project would reduce the availability of water for future uses, whether by physical effects on the water table or by consumption of a major portion of the annual sustainable yield. Others pointed specifically to Nye County, asking whether the population growth due to the project will conflict with future baseline water use.

Response. The DOE estimate of repository water use has been changed, on the basis of a more detailed analysis, to 350 acre-feet per year. In addition, an inventory of agricultural, industrial, municipal, and domestic users in the Alkali Flat-Furnace Creek Ranch ground-water basin has been conducted. Potential effects upon local users appear, on the basis of this information, to be negligible. Section 5.4.3.3 of the draft EA has been revised to incorporate the additional information.

The DOE agrees that a more thorough review of water supply and demand in southern Nye County is required in order to gain a complete understanding of potential impacts of repository-induced population growth in the area. Information available from published sources was, however, sufficient to enable the preliminary conclusion that water supplies would be sufficient, given solution of some existing problems. The analysis presented in Section 3.6.3.3 of the EA showed that if the present trend of conversion of land use in the Pahrump Valley from irrigated agriculture to residential development continues, then the valley-fill aquifer can support up to about 16,900 people without a decline in usable storage. The situation in the Amargosa Valley, whose ground-water basin has been designated by the State Engineer, is less clear. Although the basin is over-appropriated, actual irrigation water use is less than half of the sustained yield. If agricultural development remains limited, then there would be considerable opportunity for expansion of domestic and quasi-municipal uses, which would have the highest preference. Conversion of land use from agricultural to residential as in Pahrump would improve the water supply situation further. The Beatty water supply problems are discussed in Section 3.6.3.3 of the EA. If new high-quality water sources are not found for that community, then its growth potential could be limited. Section 5.4.3.3 of the EA has been revised to incorporate new information about Amargosa Valley.

Projection of regional needs. Other commenters noted that the discussion in Section 5.4.3.3 of the draft EA appears to be contradictory: one paragraph states that municipal and private water supplies near Yucca Mountain appear to be adequate, while the second paragraph reports legal and technical uncertainty of water sources to meet increased demands in the Las Vegas Valley beyond the year 2000.

It was asked if it is conceivable that the Las Vegas area may need to draw water from the aquifer beneath Yucca Mountain in 500 or 1,000 years. Finally, it was requested that the EA include a discussion of pre- and postclosure contamination of aquifers by radionuclides.

Response. The first citation applies to communities in Nye County near the Yucca Mountain site. The second citation applies only to the Las Vegas valley. The first paragraph of Section 5.4.3.3 of the draft EA was revised to clarify this.

It is conceivable that the Las Vegas Valley could seek to augment its water supplies by an interbasin transfer of water from the Alkali Flat-Furnace Creek Ranch ground-water basin 500 to 1,000 years from now. However, it is equally conceivable that such augmentation would draw on other basins.

For a discussion on radionuclide behavior and transport, the reader is referred to Section 6.4 of the EA.

Issue: Waste-water treatment facilities

The DOE received two comments on the discussion of the project impacts on waste-water treatment facilities in the affected area. First, it was stated that the EA should discuss possible impacts on sewage treatment capacity, including any expansion needs, and locations of new waste-water treatment facilities. It was also pointed out that the text of Section 5.4.3.4 of the draft EA does not mention Clark County.

Response

From the information which was available from published sources during preparation of the draft EA, waste-water treatment systems in both Nye and Clark counties will be adequate for the increased demand resulting from repository-related population growth. For the method used to evaluate the Yucca Mountain site against the Socioeconomic Impacts Guideline, detailed information on the locations of new facilities was not necessary. The draft EA has been revised to say that waste-water treatment systems in Clark County probably will be adequate for the increased demand resulting from repository-related population growth.

Issue: Public safety services

Four comments concerning impacts of the project on public safety services in the affected area were received. Two requested more information on responses to radiological emergencies, saying that the impacts on training and equipment to prepare the volunteer fire fighters in Nye County for handling radiological emergencies may be severe. In addition, it was felt that large numbers of immigrants to Nye County (or even Clark County) who do not have jobs (people attracted in hope of work) could cause a strain on the police systems of the county.

Response

It is not likely that the impacts on local emergency service providers will be severe, since the Nuclear Waste Policy Act provides for mitigation of identifiable impacts of this nature. Further research will be conducted to identify potential training and equipment requirements and the need for mitigation.

It is not certain, from the information available at this time, whether, or to what extent, the repository project would result in immigration of people who would not find employment. Information on whether these unemployed persons would cause more or less of a strain on police services than do presently unemployed persons is also not available. To make any judgments

at this point would be speculative. Instead, further research on the potential for increases in demand on public safety services by repository-related immigrants will be conducted in future studies if the Yucca Mountain site is approved for site characterization.

Issue: Medical services

The DOE received five comments on the effects of the repository project. These address the following topics: impacts of radiological accidents, and impacts from immigrants.

Impacts of radiological accidents. Two commenters requested discussion of what demands a major accident involving radioactive waste (either at the site or in adjacent communities) would place on existing or proposed medical facilities.

Response. Section 5.3.2.2 of the final EA discusses the radiological impacts associated with occupational and nonoccupational exposure due to normal and accident conditions; impacts due to accidents alone were not calculated for the southern Nevada region. Depending upon the transportation route and mode (i.e., rail or truck), and whether a monitored retrievable storage (MRS) facility were used, there would be between 0.07 and 0.91 fatality due to transportation-related exposure in southern Nevada during the operations period. Section 5.3.2.3 of the final EA discusses nonradiological impacts due to high-level radioactive waste transportation. Again, depending upon the transportation route and mode, and whether a MRS facility were used, there would be between 1.5 and 18.8 injuries during the operations period. These additional cases are unlikely to overload existing and planned health-care facilities.

Impacts from immigrants. Two commenters requested projections of what the current medical service situation means in terms of future growth projections for the area. Included in such an analysis would be information on whether more doctors will be attracted to the affected area because there are more people or whether the characteristics of rural living will continue to keep the number of health professionals low.

One commenter noted that the EA should include a considerably more detailed analysis of impacts on rural health care facilities, since health care might be significantly affected in Nye County if large numbers of families move there for a few months only (i.e., during the construction phase).

Response. The EA already uses the current medical service situation to predict incremental service levels, in that service ratios are assumed to remain constant. For example, tables 5-50 (Maximum service requirements associated with the location of a repository at Yucca Mountain--vertical emplacement) and 5-51 (Maximum service requirements associated with the location of a repository at Yucca Mountain--horizontal emplacement) of the final EA show estimated increases in the number of doctors and hospital beds required to accommodate increased population. In addition, Section 5.4.3.6 of the final EA states that "... a small increase in the demand for health-care facilities ... would result from repository construction." The question

of what influences the decisions of doctors to settle (or not to settle) in health-service shortage areas was beyond the scope of the EA. As is discussed below, the evaluation of health care facilities was part of the same coarse screening analysis applied to all community services. The detailed information requested was not necessary for the evaluation. The incremental health services requirements reported in tables 5-50 and 5-51 of the final EA apply during each period of the project, regardless of the tenure of residence of the immigrants. The preliminary conclusion of the DOE, based upon available information, is that impacts on health care services are not likely to be significant. Further research in this area will be conducted during post-EA site investigations should the Yucca Mountain site be approved for site characterization.

Issue: Mitigation

The DOE received three comments concerning mitigation of potential community services impacts. One stated that "... a more adequate quantification of potentially required resources and the need for mitigation funding by the Federal Government should be addressed more substantially in the assessment."

Response

At this point of the site selection process, identification and quantification of mitigation measures related to repository construction and operation is inappropriate. The need for mitigation will be identified as the result of more detailed analyses to be performed during preparation of an Environmental Impact Statement.

Issue: Lincoln County or Statewide impacts

The DOE received eight comments which objected to the limitation of the community services impact analysis to Clark and Nye counties. Additionally, two commenters suggested that their calculation of the percent population increase for the city of Alamo, in Lincoln County (13 percent), would far exceed the population growth rate shown in Table 5-49 of the draft EA for Clark and Nye counties (2.9 percent) and consequently would severely strain local community services.

Response

The rationale for limiting the community services analysis to the bicounty area is the same as that for limiting the remainder of the socio-economic analyses to Clark and Nye counties. The reader is referred to Section C.7.4 of this Appendix and Section 3.6 of the final EA for a discussion of this rationale. The population growth rates shown in the EA are year to year (i.e., annual) growth rates and cannot be compared to a growth rate expected to occur over a 16-year period (i.e., between 1980 and 1996). When the annual population growth rate for Alamo is calculated using the methods used to prepare Table 5-49 of the draft EA, the annual growth rate between 1995 and 1996 (the period of the highest annual growth rate shown in the draft EA) which is comparable to 2.9 percent for Clark and Nye counties (shown in the draft EA as the annual growth rate between 1995 and 1996) is 2.0 percent.

Issue: Transportation systems

The DOE received five comments concerning the impacts of the repository project on local roads. Commenters suggested that in the long run, the project could make areas like Pahrump into detached suburbs of the Las Vegas metropolitan area. Growth in these areas will strain the existing transportation network and there will be a need for new roads. They asked what effect the transportation of heavy equipment and materials will have on the physical condition of roads in the affected area. They also asked what the basis is for the selection of the roads listed in Table 5-55 (Projected annual average daily traffic on U.S. 95 in Las Vegas, 1996). A number of these are not limited-access roads and traverse densely populated segments of urbanized Las Vegas.

Response

Insufficient information is available to determine whether Pahrump and other communities near the Yucca Mountain site would become detached suburbs. It is true that increased population levels will increase demands on regional and transportation networks. However, the preliminary conclusion of the analysis conducted for the EA is that the incremental increases due to the repository project would not be significant. It is true that the draft EA does not address the question of potential damage to roads due to transportation of heavy materials and equipment.

It appears that the reviewer misinterpreted tables 5-55 (Projected annual average daily traffic on U.S. 95 in Las Vegas, 1996) and 5-56 (Projected annual average daily traffic on I-15 in Las Vegas, 1996) of the draft EA (tables 5-53 and 5-54 of the final EA, respectively). The road names listed in the left-most column of each table are segments of U.S. Highway 95 and Interstate 15, respectively, rather than a sequence of surface roads. Both highways have limited access in the Las Vegas metropolitan area. The fact that they traverse densely populated areas was taken into account in the transportation impact analysis presented in Section 5.3.2. It is highly likely that Interstate 15 and U.S. Highway 95 will carry high-level waste to the proposed repository should truck transport be involved.

Issue: General comments

The DOE received 16 comments which covered more than one community services area or concerned the general quality of the community services impact assessment. These have been organized into the following topics: technical approach, Table 5-57, form of analysis, effects on community services, capabilities of social and welfare services, recreational issues, and impact definition.

Technical approach. Several commenters noted that the approach used in the EA is fairly simplistic, as it fails to consider service capacity, scale effects of population change, marginal demand, and other institutional effects.

Response. As was explained in Section C.4.1.5.3 of this Appendix, the DOE used a coarse screening so that detailed studies would not be performed on sites which ultimately would not be chosen for site characterization. The

extensive primary research which would be necessary for a thorough evaluation of existing services and projection of future service needs, and which will be conducted if the Yucca Mountain site is approved for site characterization, was therefore beyond the scope of the EA investigation.

Table 5-57. One commenter pointed out that in Table 5-57 (Summary of environmental effects associated with the construction, operation, retrievability, and decommissioning phases of the repository) of the draft EA (Table 5-55 of the final EA), neither the "Standard Operating Practice" nor the "Residual Impacts of Significance" column reflects impacts or potential solutions.

Response. It is not true that the "Residual Impacts of Significance" column of Table 5-57 of the draft EA does not reflect impacts. Several expected impacts, including some deemed potentially significant, are reported. In several cases, the need for additional research is reported as necessary.

Form of analysis. Another commenter objected to the form of the analysis, saying that "DOE is being selective without basis in assessing impacts (e.g., education section relative to Clark County)."

Response. Assessment of community services impacts was neutral with respect to counties. Incremental increases in community services demand were assumed to be proportional to incremental population growth. Because Clark County has a much higher current population than does Nye County, the percentage by which service demands are projected to increase is higher in Nye County than in Clark County, although the absolute numbers (e.g., number of new teachers) are projected to be higher in the latter.

Effects on community services. Ten commenters addressed the general topic of effects on community services. Nine commenters noted that uneven settlement patterns within rural Clark, Nye, or Lincoln counties could have a drastic effect upon the ability of these counties to provide adequate community services. Further, workers may move into communities well in advance of the time they can be expected to be hired. This will have far greater impacts on all local services than would be the case if labor supply and demand forces worked perfectly. These same commenters felt that the impact on service needs resulting from an influx of repository-related workers and families who are in the aggregate dissimilar in age, race, sex, income, etc. from residents already in the area should be discussed in the EA. For example, greater demands may be placed on law enforcement agencies, while the demand for library books may be smaller. Because estimates of community services requirements ultimately depend upon employment requirements, it was suggested that the final EA must base all such impact analyses on defensible labor-force calculations.

Response. As was discussed in sections C.4.3 and C.7.1.2 of this Appendix, the direct labor force estimates have been revised in the light of new design information and the EA has been revised to reference the documents used to obtain them. The DOE considers the multipliers used to forecast indirect employment and dependents per worker to be reasonable. Section 5.4.1.1 of the EA has been revised to discuss the derivation of the indirect employment multiplier and to document its sources.

For the socioeconomic analyses, the DOE assumed that the Nevada Test Site settlement pattern described in Table 5-29 (Settlement patterns of Nevada Test Site employees) of the draft EA (Table 5-26 of the final EA) is a reasonable indicator of the settlement patterns of potential repository-related immigrants. In the absence of community-level population forecasts, it was also assumed that the present ratios between town and county populations will exist in the future. Using these assumptions and estimates of project-induced population growth, the DOE estimated maximum annual population growth rates for several communities in the affected area with the presence of a repository (see Section 6.2.1.7.4 of the final EA and Section C.7.4 of this Appendix). In addition, it was noted that the service providers who would most likely be responsible for responding to repository-related demand are better equipped than are unincorporated town governments. While settlement patterns will most likely be uneven, they are not likely to have drastic effects on service providers.

As is noted in C.7.4.1, it is not necessarily certain that immigrants will settle in the affected area well in advance of the project. Forecasts of leads and lags in immigration will be the subject of research in post-EA investigations. In any event, since significant population growth impacts during the peak year of immigration are not expected, it is unlikely that impacts would be significant during one of the preconstruction years. Finally, communities will have ample time during site characterization and preparation of an Environmental Impact Statement to prepare for some pre-project immigration.

Estimates of the demographic characteristics of the projected work force were not necessary for the analyses presented in the EA. Such estimates may be made as part of future analyses if the Yucca Mountain site is approved for site characterization.

Capabilities of social and welfare services. Four commenters noted that it is important that the final EA carefully examine the current and future capabilities of local, county, and State social and welfare services to meet expanding needs. These commenters also stated that the existing service ratios are extremely questionable because (1) the population distribution assumed in the EA (83 percent for Clark County, 13 percent for Nye County) probably understated the impacts in Nye County, (2) mining and construction workers place different types of demands on services than do existing residents, and (3) some services may be at their capacity while others may be below.

Response. Given the coarse screening methodology described above, it was not necessary to examine all types of community services in the same depth. Furthermore, published information on provision of social services by local agencies was unavailable in sufficient detail to enable a thorough analysis. However, given the potential for impacts sometimes associated historically with rapid population growth, local social service delivery systems will be examined in later studies, if the Yucca Mountain site is approved for site characterization.

The assumption that 83 and 13 percent of immigrants would settle in Clark and Nye counties, respectively, has no bearing on the validity of applying existing service ratios to future populations. The same ratios

would be multiplied by the Nye County population forecast, whatever its value. It is true that an analysis of the adequacy of community services at the margin (i.e., of the additional services required by each additional member of the community, be it a construction worker, miner, other type of worker or dependent) would be preferable. However, insufficient data were available for such an analysis. More detailed investigations, to be undertaken if the Yucca Mountain site is approved for site characterization, will include consultation with communities to ascertain appropriate measures of service levels. Finally, it is reasonable to expect that actual average historical service levels (in the form of per capita ratios) reveal citizen preferences; they implicitly take into account community judgment as to the adequacy of services.

Recreational issues. Three commenters pointed out that the EA does not address recreational issues in any detail. No systematic attempt is made to study potential impacts.

Response. Potential impacts on the ability of communities to provide recreational services were judged to be rather small, and thus were not discussed in the EA.

Impact definition. A last commenter asked for the definition of an impact as used in the draft EA, noting that what may seem insignificant to the DOE may in fact be significant to the community.

Response. The DOE agrees that impacts may be perceived differently by different parties. However, the nature of these impacts will not be arbitrarily defined by the DOE without consultation with local community representatives.

C.7.4.4 Social conditions

The U.S. Department of Energy (DOE) received 18 comments on the Environmental Assessment (EA) analysis of the potential impacts of the Yucca Mountain repository on social conditions in the affected area. These were divided into six issues: (1) Impacts Along Transportation Routes, (2) Impacts on Urbanized Las Vegas, (3) Effects of Immigration, (4) Special Effects, (5) Native Americans, and (6) Culture and Lifestyle Effects.

Issue: Impacts along transportation routes

Five commenters expressed concern that the EA does not address the sociocultural effects of transportation along potential high-level radioactive waste transportation routes.

Response

A thorough analysis of the transportation effects on social conditions cannot be undertaken until actual transportation routes and primary sociocultural data have been collected.

The DOE is aware of, and has indeed identified in Section 5.4.4 of the EA, the potential for the occurrence of special effects from high-level

radioactive waste transportation throughout the region. Particular note was made of the potential for mobilization and formation of opposing and supporting groups (Section 5.4.4.1.2), of the likelihood that Clark County residents would view high-level radioactive waste transportation negatively (Section 5.4.4.3), and of the potential threat to Native American cultures (Section 5.4.4.2). The sensitivity to the social effects of high-level radioactive waste transportation will guide future studies to be undertaken if the Yucca Mountain site is approved for site characterization. The gathering of primary, community-level data and greater certainty concerning all aspects of high-level radioactive waste transportation will permit a more detailed assessment to be undertaken at that time.

Issue: Impacts on urbanized Las Vegas

One commenter, in reference to an unspecified paragraph in EA Section 5.4.4, noted that it refuted earlier statements of insignificant impact in urbanized Las Vegas.

Response

If the comment refers solely to the first paragraph of Section 5.4.4.1.1 of the draft EA, and the contrast between the second sentence and the remainder of the paragraph, then the criticism is valid. In any event, the sentence was reworded to read: "In light of...the overall effects are not expected to be significant. Further study is required to assess whether there could be impacts on particular communities."

If the comment refers to the contrast between sections 5.4.4.1.1 and 5.4.4.1.2 of the EA, then the criticism is not valid. The former section refers to standard effects, while the latter refers to special effects.

Issue: Effects of immigration

The DOE received four comments on the social impacts resulting from immigration of repository workers and their dependents to communities in the affected area. These have been divided into the following topics: social structure and organization, absorption of outside workers, advance immigration, and stability of employment.

Social structure and organization. One commenter noted that standard effects on social structure and organization may be extremely significant if large groups of repository workers settle in relatively small Clark County communities or are concentrated in a few specific neighborhoods.

Response. It is true that, although these effects on social structure and organization are unlikely to be significant overall, there could be impacts on particular communities or areas if such settlement patterns occur. The EA has been revised to acknowledge this possibility. However, it is also true that the data on Nevada Test Site workers presented in Table 5-29 (Settlement patterns of Nevada Test Site employees) of the draft EA do not

indicate that the type of settlement patterns postulated in this comment are likely to occur. Additional investigation and evaluation of present and potential future settlement patterns will be conducted if the Yucca Mountain site is approved for site characterization.

Absorption of outside workers. One commenter observed that it is inappropriate, given the level of data and the paucity of research, to suggest that the social heterogeneity of the area will automatically facilitate absorption of outside workers.

Response. The text does not suggest that the heterogeneity of the area will automatically facilitate absorption of outside workers. However, absence of a homogeneous culture and assimilation of large numbers of immigrants in the past, do suggest that cultural assimilation will be facilitated; impacts on social structure and social organization could occur, as noted in Section 5.4.4.1 of the EA and associated subsections.

Advance immigration. The last commenter on this issue noted that the draft EA postulates that the long lead time of the project may reduce eventual social disruption. It does not consider the converse possibility that the long lead time may exacerbate the problem by causing workers, motivated by rumors of lucrative employment, to flow into the area well in advance of actual construction. Such a situation would strain existing local institutions and compound whatever natural conflicts there might be between residents and newcomers.

Response. The EA has been revised to acknowledge the possibility of social impacts due to advance immigration.

Stability of employment. One commenter questioned whether the claim that stability of employment would be created by the project was valid and noted that employment is only stable in the operation phase, not the construction phase.

Response. Different readers could have different interpretations of the meaning of stable employment. However, under the schedule for the two-phase repository, construction workers would be required for about seven and one half years. For the construction industry, 7 years' employment on a single major project may reasonably be construed to be stable.

Issue: Special effects

The DOE received six comments regarding special social effects. Three topics were identified: public perceptions of risk, additional special effects, and details of future investigations.

Public perceptions of risk. Commenters noted the importance of analyzing attitudes and perceptions on which behavior and decisions are based, and queried the implications of public perceptions of risk. The latter included specific queries about the long-term effects on social structure and social institutions and the implications of likely public perception of the site and surrounding area as dangerous and radioactively contaminated.

Response. The significance of attitudes and perceptions is not questioned. However, primary data collection and analysis are required to ascertain the nature of public perceptions and to identify their implications. This type of analysis is more appropriate to an Environmental Impact Statement (EIS) than to an Environmental Assessment.

Additional special effects. One commenter requested inclusion of an additional effect in the list of special effects cited in Section 5.4.4 of the draft EA. It was stated that the effect to be included is that of public perception of risks associated with a repository and with shipping highly radioactive materials through the State. Other commenters criticized the inadequate treatment afforded special effects throughout the entire socio-economic sections of the draft EA and noted the wide range of social, economic, and political effects that could occur.

Response. It would be more accurate to view the public's perception of risks associated with a repository and with shipping radioactive materials as a source of special effects. Special effects were specifically identified in the social section of the draft EA. Future analyses would be conducted if the Yucca Mountain site is approved for site characterization.

Details of future investigations. Commenters requested a description of the methodology and framework by which further investigations of special effects will be undertaken.

Response. Such information is not available at this time.

Issue: Native Americans

One commenter stated that a discussion of possible impacts, if any, on Native American tribes should be added to the EA.

Response

As was stated in Section C.7.4 of this Appendix, Native Americans have been treated in a manner similar to other cultural units in the affected area. They have not been singled out for special analysis because they have not been certified as "affected" tribes within the meaning of Section 2(2)(B) of the Nuclear Waste Policy Act.

Native American issues were considered, but no identifiable impacts were found. The location of American Indian reservations in urban Las Vegas and in three rural areas distant from the site (as reported in sections 3.6.4.2.1 and 3.6.4.2.2 of the final EA) is such that they are not expected to be affected by the immigration of repository workers. The final EA has been revised to include more detail concerning the number of American Indians residing in the biconity area and the location of reservations relative to the proposed Yucca Mountain site. Specific note was made in Section 5.4.4.2 of the potential for impacts on Native American culture from transportation activities. This aspect will receive appropriately detailed treatment in future studies, following identification of actual transportation routes.

Issue: Culture and lifestyle effects

One commenter requested a clear description of what constitutes culture and lifestyle effects and variables for analysis, inclusion of a preliminary analysis of the major potential impacts on each community, and establishment of a comprehensive framework by which additional investigation will be carried out if Yucca Mountain is selected for site characterization.

Response.

A detailed description of the constituents of culture was presented in Section 3.6.4.2 of the draft EA. Briefly, culture can be defined as shared ideas that regulate behavior. Primary variables for analysis include attitudes, beliefs, and values, all of which require primary data collection. The community-level data collection and analysis requested by the commenters was beyond the scope of the EA. A study plan will be developed if the Yucca Mountain site is approved for site characterization.

C.7.4.5 Fiscal conditions and government structure

The U.S. Department of Energy (DOE) received 16 comments on the analysis of the potential impacts of the Yucca Mountain repository on fiscal conditions and government structure in the affected area. Issues include: (1) Predeterminations by the DOE, (2) Provisions for Mitigating Fiscal Impacts, (3) Revenue Lag, and (4) Impacts in Lincoln County.

Issue: Predetermination by the DOE

One commenter stated that DOE has predetermined that no significant impacts will occur without providing an analysis to substantiate its claims.

Response

The DOE does not agree with this statement. The EA states that the repository could create fiscal impacts through the increased demands on community services. The EA also states that the level of significance of these impacts would be a function of the level of repository-related population immigration. The statement in the EA that community service-related fiscal effects might be "insignificant" refers only to those urban areas of Clark County where the expected number of repository-related immigrants represent a very small percentage increase over the existing population. The EA also recognizes the need for quantitative analysis of fiscal impacts and eventual fiscal assistance for impact mitigation.

Issue: Provisions for mitigating fiscal impacts

The DOE received 11 comments on the EA discussion of measures to mitigate impacts on local and State governments' fiscal conditions. Topics include: mitigation provisions, funding mechanisms, effects on local government, and EA organization.

Response. The comment incorrectly assumes that all readers are familiar with the content of the NWPA. The mitigation provisions of the NWPA are directly relevant to the probable fiscal consequences of the project. For this reason, the discussion of the NWPA has been included.

Funding mechanisms. Other commenters asked whether State and local governments will have to absorb increased costs for community services during repository operation, whether the State would be required to provide impact aid and funds, and if so, whether financial assistance would be provided for timely planning. One commenter questioned the statement in the EA that some repository-related costs to local government would be offset partially by increased revenues.

Other commenters felt that alternative procedural mechanisms should be developed to ensure that necessary planning and mitigation assistance is directed to both State and local governments affected by the repository. An equitable means should be developed to determine the amount of compensation required to offset social costs that fall outside traditional community-impact-assistance formulas.

Response. The NWPA provides for financial and technical assistance for states involved in the repository-siting process to help mitigate repository-related impacts. The nature and amounts of such assistance are to be contained in a report prepared by the State at the end of site characterization and submitted to the DOE. The DOE is required to negotiate a written agreement with the State which details the nature and amount of impact mitigation assistance during repository construction and operation.

While it is true that potential increases in State and local government revenue have not been quantified in the EA, it is reasonable to expect that tax revenues would rise as a result of repository-related wage payments to immigrants and repository-related purchases of goods and services in the affected area.

Regarding the timeliness of DOE assistance for planning, the DOE grants to the State of Nevada are already in place to support efforts on the part of the State and affected localities to plan for potential economic, social, and public health and safety impacts of a repository. The purpose of these grants is to enable the State and localities to work with the DOE to identify potential impacts and requirements well in advance of the beginning of construction and to allow timely mitigation. Thus, pre-impact assistance is currently available for mitigation planning. Additional grants will be provided according to the schedule specified in the NWPA and summarized briefly in Section 5.4.5 of the EA.

Procedural mechanisms and methods of determining the appropriate amount of compensation would be developed in future studies if the Yucca Mountain site is approved for site characterization. Issues concerning the distribution and quantification of financial aid would be addressed at that time. Quantitative estimates of fiscal impacts would appear in the Environmental Impact Statement.

Effects on local governments. Another reviewer asked how the DOE could justify any site-comparative evaluation unless it has identified the major implications a repository is likely to have on the structure and stability of affected governments.

Response. It is not anticipated that repository development would affect local government structure. Detailed financial analysis of fiscal impacts to State and local governments will be conducted in future studies if the Yucca Mountain site is approved for site characterization.

EA organization. A last commenter noted that the EA should be organized so that each socioeconomic and transportation section contains an analysis of the potential costs projected for each level of government.

Response. As is explained in Section C.4.1.5.3 and elsewhere in this Appendix, a detailed analysis of the type suggested is neither possible nor appropriate in a screening study such as was performed to select sites for characterization. It is, however, appropriate for an Environmental Impact Statement. Thus, detailed analyses of repository-related impacts on State and local governments and the fiscal ramifications of those impacts will be conducted in future studies if the Yucca Mountain site is approved for site characterization.

Issue: Revenue lag

Three commenters noted that State and local government revenues lag behind population growth. Immigrants may demand full services upon arrival, but do not contribute to revenues until they have lived in a community for some time.

Response

It is true that government revenues tend to lag behind population growth. As noted above, the NWPA provides for financial assistance to State and local governments. The State may take the lag problem into account in developing its report on the nature, amount, and timing of the required assistance.

Issue: Impacts in Lincoln County

One commenter asked that Lincoln County be noted as a rural community having potentially significant impacts.

Response

The reader is referred to Section C.4.1.5 for a discussion of the reasons for limiting the fiscal impacts analysis to Clark and Nye counties.

C.7.5 SYSTEM GUIDELINE

This issue addresses the preclosure system guideline on environment, socioeconomics, and transportation. Questions and comments assigned to this

category concern the health and safety of the public and the protection of the environment during repository siting, construction, operation, closure, and decommissioning.

Three comments were received on this issue. One commenter stated that the draft EA should have assessed an accident and a worst-case release of radioactivity in an urban area. Another commenter noted that the socioeconomic segments of the EA lacked substantive analysis. A last commenter felt that the DOE cannot, on the basis of information contained in the EA, support the finding that the public and the environment shall be adequately protected from the hazards posed by the disposal of radioactive waste.

Response

Chapter 6 of the final EA contains an assessment of the consequences of an accident and the subsequent release of radioactivity in an urban area. The DOE notes the commenter's view regarding adequate protection for the public and the environment but feels that the presentation of information and analyses in chapters 3, 4, 5, and 6 of the EA adequately support the guideline finding relative to environment, socioeconomics, and transportation. If the Yucca Mountain site is nominated for additional investigative studies, then further detailed geotechnical and environmental investigations will be undertaken.

REFERENCES FOR CHAPTER C.7

- Bell, E. J., and L. T. Larson, 1982. Overview of Energy and Mineral Resources for the Nevada Nuclear Waste Storage Investigations, Nevada Test Site, Nye County, Nevada, NVO-250, Nevada Operations Office, U.S. Department of Energy, Las Vegas.
- Craig, R. W., and J. H. Robison, 1984. Geohydrology of Rocks Penetrated by Test Well UE-25p 1, Yucca Mountain Area, Nye County, Nevada, USGS-WRI-84-4248, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.
- DOE (U.S. Department of Energy), 1979. Environmental Aspects of Commercial Radioactive Waste Management, DOE/ET-0029, Vol. 3, Appendix C, Washington, D.C.
- DOE (U.S. Department of Energy), 1980. Final Environmental Impact Statement on the Management of Commercially Generated Radioactive Waste, DOE/EIS-0046F, three volumes, Washington, D.C.
- DOE (U.S. Department of Energy), 1985. Mission Plan for the Civilian Radioactive Waste Management Program, Overview and Current Program Plans, DOE/RW-0005, three volumes, Washington, D.C.
- DOE/NVO (U.S. Department of Energy/Nevada Operations), 1985. Radiological Assistance Team, NV Notification Procedure, Revision 11, Las Vegas, Nev.
- DOT (Department of Transportation), 1984. Guidelines for Selecting Preferred Highway Routes for Highway Route Controlled Quantity Shipments of Radioactive Materials, DOT/RSPA/MTB-84/22, Materials Transportation Bureau, Washington, D.C.
- Dudley, W. W., Jr., and J. D. Larson, 1976. Effect of Irrigation Pumping on Desert Pupfish Habitats in Ash Meadows, Nye County, Nevada, U.S. Geological Survey Professional Paper 927, Washington, D.C.

- EPA (U.S. Environmental Protection Agency), 1977. Compilation of Air Pollutant Emission Factors, AP-42, Third Edition (with Supplements 1-15), Research Triangle Park, N. C.
- Foster, B., and J. Jordan, 1984. A Guide to Radioactive Materials Transportation, S. Bjorkman (ed.), SAND84-7143, Sandia National Laboratories, Albuquerque, N. Mex., 50 p.
- Knauss, K. G., J. M. Delany, W. J. Beiriger, and D. W. Peifer, 1985. "Hydrothermal Interaction of Topopah Spring Tuff with J-13 Water as a Function of Temperature," Scientific Basis for Nuclear Waste Management VIII, Materials Research Society Symposia Proceedings, C. M. Jantzen, J. A. Stone, and R. C. Ewing (eds.), Vol. 44, Pittsburgh, Penn., pp. 539-546.
- MacDougall, H. R. (comp.), 1985. Two-Stage Repository Development at Yucca Mountain: An Engineering Feasibility Study, SAND85-1351 (Rev. 1), Sandia National Laboratories, Albuquerque, N. Mex.
- McBrien, S. and L. Jones, 1984. Nevada Nuclear Waste Storage Investigations: Socioeconomic Impacts of Constructing a High-Level Waste Repository at Yucca Mountain, SAND84-7201, Sandia National Laboratories, Albuquerque, N. Mex.
- Moore, G. H., 1983. "National Bureau of Economic Research Studies in Business Cycle, No. 24," Business Cycles, Inflation, and Forecasting, 2nd Edition, Ballinger Publishing Co., Cambridge, Mass.
- Morales, A. R. (comp.), 1985. Technical Correspondence in Support of the Final Environmental Assessment Document, SAND85-2509, Sandia National Laboratories, Albuquerque, N. Mex.
- NWPA (Nuclear Waste Policy Act), 1983. "Nuclear Waste Policy Act of 1982," Public Law 97-425, 42 USC 10101-10226, Washington, D.C.
- Oversby, V. M., and K. G. Knauss, 1983. Reaction of Bullfrog Tuff with J-13 Well Water at 90 deg C and 150 deg C, UCRL-53442, Lawrence Livermore National Laboratory, Livermore, Calif.

Pippin, L. C., 1986. An Overview of Cultural Resources on Pahute and Rainier Mesas on the Nevada Test Site, Nye County, Nevada, Desert Research Institute Technical Report Series No. 45, Las Vegas, Nev, pp. 1-8, 55-70.

Pradere, P. F., 1983. Letter from P. F. Pradere (State of Nevada, Department of Transportation) to J. Bradbury (SAI), November 17, 1983; data on transportation attached.

Rosenberg, N. J., 1974. Microclimate: The Biological Environment, John Wiley & Sons, New York.

SAIC (Science Applications International Corporation), 1985. High-Level Nuclear Waste Transport and Storage Assessment of Potential Impacts on Tourism in the Las Vegas Area, Las Vegas.

State of Nevada, 1983. Air Quality Regulations, Air Pollution Control Law, Title 40, Chapter 445, The Bureau of National Affairs Inc., Washington, D.C.

State of Nevada v. John Herrington, 1985. United States Court of Appeals for the Ninth Circuit, Filed December 2, 1985, Ca. No. 84-7846.

Thordarson, W., 1983. Geohydrologic Data and Test Results from Well J-13, Nevada Test Site, Nye County, Nevada, USGS-WRI-83-4171, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.

Waddell, R. K., 1982. Two-Dimensional, Steady-State Model of Ground-Water Flow, Nevada Test Site and Vicinity, Nevada-California, USGS-WRI-82-4085, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.

Waddell, R. K., J. H. Robison, and R. K. Blankennagel, 1984. Hydrology of Yucca Mountain and Vicinity, Nevada-California--Investigative Results Through Mid-1983, USGS-WRI-84-4267, Water-Resources Investigations Report, U.S. Geological Survey, Denver, Colo.

Wang, Y. (ed.), 1969. Handbook of Radioactive Nuclides, The Chemical Rubber Company, Cleveland, Ohio, pp. 845-867.

White, W. T., B. Malamud, and J. E. Nixon, 1975. Socioeconomic Impacts of the Second Stage of the Southern Nevada Water Project and Its Alternatives, U.S. Bureau of Reclamation, Boulder City, Nev.

Young, R. A., 1972. Water Supply for the Nuclear Rocket Development Station at the U.S. Atomic Energy Commission's Nevada Test Site, USGS-WSP-1938, Water-Supply Paper, U.S. Geological Survey, Washington, D. C.

CODES AND REGULATIONS

- 10 CFR Part 20 (Code of Federal Regulations), 1980. Title 10, "Energy," Part 20, "Standards for Protection Against Radiation," U.S. Government Printing Office, Washington, D.C.
- 10 CFR Part 960 (Code of Federal Regulations), 1984. Title 10, "Energy," Part 960, "General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories; Final Siting Guidelines," 49 FR 47714, Vol. 49, No. 238, December 6, 1984, pp. 47714-47769.
- 40 CFR Part 61 (Code of Federal Regulations), 1984. Title 40, "Protection of Environment," Part 61, "National Emission Standards for Hazardous Air Pollutants," U.S. Government Printing Office, Washington, D.C.
- 40 CFR Part 190 (Code of Federal Regulations), 1982. Title 40, "Protection of Environment," Part 190, "Environmental Radiation Protection Standards for Nuclear Power Operations," U.S. Government Printing Office, Washington, D.C.
- 40 CFR Part 191 (Code of Federal Regulations), 1985. Title 40, "Protection of Environment," Part 191, "Environmental Standards for the Management and Disposal of Spent or Nuclear Fuel, High-Level and Transuranic Radioactive Wastes: Final Rule," Federal Register Vol. 50, No. 182, September 19, 1985.
- 40 CFR Part 192 (Code of Federal Regulations), 1984. Title 40, "Protection of Environment," Part 192, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," U.S. Government Printing Office, Washington, D.C.

49 CFR Part 171 (Code of Federal Regulations), 1983. Title 49,
"Transportation," Part 171, "General Information,
Regulations, and Definitions," U.S. Government Printing
Office, Washington, D.C.

49 CFR Part 177 (Code of Federal Regulations), 1983. Title 49,
"Transportation," Part 177, "Carriage by Public Highway,"
U.S. Government Printing Office, Washington, D.C.



C.8 EASE AND COST OF SITING, CONSTRUCTION, OPERATION, AND CLOSURE

This section addresses comments about the problems and costs of constructing, operating, and closing the repository. It focuses on the evaluation of guidelines related to the engineering and design of the repository and how those guidelines are used to evaluate the system guideline for ease and cost of repository development. This evaluation draws heavily on the baseline description of the site and the repository system in Section C.4. In contrast to Section C.7, which focuses on the effects of site characterization and repository development, this section, like sections C.5 and C.6, focuses on the evaluation of site suitability on the basis of the siting guidelines.

C.8.1 SURFACE CHARACTERISTICS

Seven comments were received, two dealing with a reference omission and five regarding facility flood potential. The comments on flooding indicated that the data presented in Squires and Young (1984) are not adequate to support the conclusion that the surface facility will be located in areas subject to only minor and infrequent flooding.

Response

The current reference conceptual repository is not expected to require flood protection through engineering measures. The only measures that would be taken are on adjacent washes over which access roads would pass. Although the Environmental Assessment states that significant flooding of the surface facilities is not likely, the Probable Maximum Flood will be determined during site characterization.

The potential for flooding, as a result of sheet flow due to rare extreme storms, does exist. The U.S. Department of Energy has determined that for this evaluation, credit cannot be taken for engineered flood protection measures, regardless of how routine they might be. Therefore, the potentially adverse condition related to potential flooding of surface and underground facilities has been changed to present.

The reference to the topographic map of Lipman and McKay (1965) is incorrect. The reference should be USGS (1961).

C.8.2 PRECLOSURE ROCK CHARACTERISTICS

Twenty-six comments were received on preclosure rock characteristics. In question are data and interpretations used in the draft Environmental Assessment (EA) to provide a preliminary, conservative evaluation of the characteristics of the Topopah Spring tuff and potential effects during site characterization, construction, and the life of the repository. The comments

received were classified into four issues: (1) Present In Situ Rock Properties and Stress, (2) Potential Thermal Effects, (3) Comparisons with Rainier Mesa G-Tunnel, and (4) Requirements for Support of Repository Components.

Issue: Present in situ rock properties and stress

Nine comments were received on the preliminary characterization of several properties of the host rock presented in the draft EA. Included are comments on the completeness of analyses of fractures, fracture fillings, joints, lithophysae, faults, and breccia in the host rock. Reviewers questioned uncertainties in the in situ stress measurements. Also addressed are the constraints that these geologic properties and the vertical thickness of the host rock had on the flexibility in selecting the location and configuration of the repository. One commenter felt that a section should be added regarding expected effects of radionuclides venting through the fracture system.

Response

Much of the available data on in situ fracture characteristics were derived from studies of Yucca Mountain boreholes and drill cores presented in Maldonado and Koether (1983), Scott and Castellanos (1984), and Spengler and Chornack (1984). These data confirm earlier data of Spengler et al. (1981) and substantiate analyses based on these data. Hustrulid (1984) considered many potential fracture dips in a stability analysis and concluded that shaft walls would be stable over a wide range of coefficients of friction across the fractures. Lithophysal cavity content was a major factor in selecting a location for the underground facility (Mansure and Ortiz, 1984). In drill holes USW GU-3, G-4, and G-1, the lithophysal cavity content at the proposed horizon was found to average less than 5 percent (Spengler and Chornack, 1984). The proposed horizon, classified as the moderately to densely welded, devitrified section of the Topopah Spring Member, volumetrically contains a very low percentage of zeolites or clays.

One commenter stated that flexibility in the placement of the repository may be more limited than expressed in the draft EA, because of the possibility of a random distribution of fractures, faults, and breccia at depth. Section 6.3.3.2.3 of the final EA describes the criteria that were used to estimate the portion of the primary area (Area 1) that is likely to be suitable for development. The final EA also includes a statement in Section 6.3.3.2.3 clarifying the relationship of unit thickness to repository placement flexibility. The statement indicates that the vertical thickness of the host rock is probably more than 3 times the thickness required (based on Mansure and Ortiz, 1984). Note that the favorable condition of significant flexibility in host rock lateral extent is not claimed for Yucca Mountain (Section 6.3.3.2.3 of the EA).

The results of Stock et al. (1984) eliminate some of the uncertainty with respect to in situ stress measurements. These data confirm the Healy et al. (1984) data taken at greater depths. In addition, these new data include some measurements in the unsaturated zone of the host rock which are consistent with vertical extrapolation of the earlier Healy et al. (1984) data.

Thus, conclusions drawn on earlier data are substantiated. In situ rock properties and stress will be more fully evaluated during site characterization.

During construction and operation of the repository, the ventilation system would maintain less than atmospheric pressure throughout the underground openings. By doing this, any releases of radioactive or nonradioactive material would be drawn into the repository openings, not blown or vented from the repository, if the ventilation system were to fail. It is anticipated that this procedure would preclude "venting" through the fracture system because there would be no net positive pressure in the repository. A description of the repository ventilation system is presented in Section 5.1 of the EA.

Issue: Potential thermal effects

Four commenters addressed possible heating of the host rock after emplacement and its effect on preclosure structures and waste retrieval.

Response

State-of-the-art numerical techniques were used by Johnstone et al. (1984) to complete a conservative estimate of the thermomechanical response of the rock mass. This study is considered preliminary, but confidence in the calculations is based on experience and field tests in similar devitrified, welded tuff in G-Tunnel at Rainier Mesa. Rock strengths used in the analysis are from water-saturated samples, whose strengths are less than that measured on dry rock under similar conditions. The thermal properties used considered the potential effects of 5 percent lithophysal porosity which translates to a lower thermal conductivity. The potential effects of discontinuities were considered as part of the analysis through an evaluation of joint slip. Small-diameter heater experiments conducted at G-Tunnel were used to help understand the thermomechanical response. Further, the presence of less than 2 percent smectites and zeolites in the repository horizon precludes anything but minor dehydration effects. An indepth study of the effects of heating on the proposed repository horizon, as well as on structural elements like grouted bolts, will be completed during site characterization. A discussion of long-term stability of structural elements of the support system has been added to Section 6.3.3.2.3 in the final EA.

Issue: Comparisons with Rainier Mesa G-Tunnel

Three commenters expressed concern over comparisons between properties of the Topopah Spring tuff at Yucca Mountain and that of the Grouse Canyon tuff, which is penetrated by G-Tunnel at Rainier Mesa.

Response

A detailed comparison of properties of the Grouse Canyon and Topopah Spring members is not considered to be necessary in the EA. This comparison is available in supporting references. The purpose of the information presented in the EA is to gain confidence on predictions of drift stability at Yucca Mountain based on the G-Tunnel experience at Rainier Mesa. The EA

compares two rock mass classifications for the Topopah Spring Member. The draft EA contains discussions of this latter comparison in Section 6.3.3.2.3, with supporting data in Tillerson and Nimick (1984) and the forthcoming Site Characterization Plan.

Issue: Requirements for support of repository components

Ten comments were received and categorized as pertinent to this issue, which addresses comments pertaining to the stability of underground openings in the host rock (Topopah Spring tuff). The issue is divided into three topics: maintenance of underground openings, support requirements, and retrievability.

Maintenance of underground openings. The majority of comments in this topic addressed the subject of minimal support and maintenance of repository drifts. These comments also questioned whether reasonably available technology will be adequate for maintaining underground openings.

Response. The only available data that can be applied to repository excavations at this time are those from other tunnels in similar rocks at Rainier Mesa and from mining, as well as civil excavations. Civil excavations are entirely appropriate to use for comparison because they are designed on an extremely conservative basis to ensure long existence. In comparing other excavations to those planned at Yucca Mountain, the expected in situ conditions do not appear to necessitate the use of technology beyond that which is reasonably available. In support of this conclusion, additional documented information has been added to sections 6.3.3.2.3 and 6.3.3.2.4 in the final EA, regarding tunneling experience in G-Tunnel and the Grouse Canyon Member at Rainier Mesa (Tibbs, 1985). The support requirements of the repository excavations in the Topopah Spring Member at Yucca Mountain are expected to be similar to those used in the welded portion of the G-Tunnel (Ortego, 1985). A near-vertical fault with at least a 1-meter (3-foot) vertical displacement was encountered in this tunnel, but no special support measures were required (Tibbs, 1985). Although the rock mass classification systems mentioned in the draft EA were developed for large excavations, they are considered to be applicable to the proposed repository because of the wide spacing between openings and the low extraction ratio that will be used in constructing the repository. In addition, support in the form of rock bolts and wire mesh was considered minimal in the discussions presented in the draft EA. All data, assumptions, and uncertainties were considered in evaluating the siting guidelines with respect to the potential need for extensive maintenance of underground openings. A discussion of the long-term stability of possible support components (e.g., shotcrete, rock bolts, and epoxies) has been added to the final EA in Section 6.3.3.2.3. Additional detailed and site-specific studies regarding drift support requirements, as well as thermal effects on those support systems, will be addressed during site characterization.

Support requirements. Some of the commenters stated that the effects of the uncertainties resulting from the lack of data on faults and fractures have not been adequately taken into account in the evaluation of support requirements. In addition it was stated that in situ stress data suggests a potential for fault-stress release during repository construction.

Response. Fracture patterns and stress measurements obtained from drillholes were the basis for determining the expected in situ stress conditions. The results of Stock et al. (1984) diminish some of the early uncertainty with respect to in situ stress measurements because the new data confirm the Healy et al. (1984) data taken at greater depths. Also, these new data include some measurements in the host rock (unsaturated zone) which are consistent with vertical extrapolation of the earlier Healy et al. (1984) results. Thus, conclusions drawn on earlier data are substantiated. Fault characteristics and the patterns of existing fractures as determined from Yucca Mountain drill core and field mapping are presented in Maldonado and Koether (1983), Scott and Castellanos (1984), and Spengler and Chornack (1984). These data confirm the earlier data of Spengler et al. (1981) and sub-stantiate analyses based on these data. Hustrulid (1984) considered many potential fracture dips in a stability analysis which predicts stable conditions for a shaft opening over a wide range in the possible coefficient of friction for the fractures. It is also unrealistic to assert that excavation of a repository (a few square kilometers) could result in tectonic activity. The surface area of a tectonic fault could reach dimensions of tens to hundreds of square miles.

Retrievability. One commenter stated that support should be given for the concept that steel borehole sleeves would mitigate some retrieval difficulties.

Response. Although the reference design is vertical emplacement, the alternate design is horizontal emplacement, in which case the steel sleeves could be an aid in waste retrieval. The principal reason for the sleeves would be to ensure that no rock material collapses into the borehole during the 30 to 50 years during which retrievability must be maintained.

C.8.3 PRECLOSURE HYDROLOGY

Twenty-one comments were related to concerns about preclosure hydrology and address the geohydrologic setting of the site. The setting of the site must be compatible with all repository activities including construction, operation, and closure. Geohydrologic conditions that may exist at the site must not compromise the functions of shaft liners and seals. The comments are categorized into three issues: (1) Flooding Potential, (2) Water Supply, and (3) Ground-Water Conditions.

Issue: Flooding potential

Six comments were assigned to this issue. Five of the comments related to the placement of the repository surface facilities and the exploratory shaft facility in an area subject to sheet flow or flooding from the Probable Maximum Flood (PMF) and the Regional Maximum Flood (RMF). One commenter suggested that the U.S. Department of Energy (DOE) decide whether credit for flood protection through engineering measures be considered in determining the findings for guidelines 10 CFR 960.5-2-8(c) and 960.5-2-10(b)(2).

Response

The draft Environmental Assessment (EA) notes that part of the area being considered for construction of surface facilities could be inundated by the 500-year and RMF along Fortymile Wash. According to the draft EA, a combination of surface grading and construction of flood barriers and diversion channels would be used to prevent the flooding.

The RMF, which is used in the EA, represents an estimated maximum potential flood for a given drainage area. It is not dependent upon slope, duration, or surface features, nor does it provide frequency. The PMF will be calculated during site characterization and will be considered during license application design and selection of the exact location of the repository surface facilities. Shafts and portals to the subsurface facilities, as well as the exploratory shaft facilities, will be designed to be above the area inundated by the PMF and the RMF. Facilities may, however, be subject to sheet flow. Sheet flow is not flooding in the normal sense; it is of short duration, limited areal extent and carries a small volume of flow. Sheet flow cannot be controlled as a natural occurrence but can be diverted through standard drainage control measures.

Credit for flood protection, even if considered as standard drainage control measures, will not be taken for 10 CFR 960.5-2-10(b)(2). The favorable condition has been changed to "not present" in the final EA for the Yucca Mountain site.

Issue: Water supply

Eight comments relating to water supply were received. These comments dealt with the adequacy of water supplies for characterization, construction and operational phases of the repository, and present and planned water-supply needs of local water users. Many commenters indicated that the estimates of present and future water needs for both the repository and local uses were inaccurate, and suggested a reassessment of the impacts of repository-related water withdrawals.

Response

The water-supply figures presented in the draft EA were incomplete. Additional information containing updated water supply data, estimates of repository water use, and related impacts from water withdrawals are in sections 5.2.2, 6.2.1.7.5, and 6.3.3.3.3 of the final EA.

It does not appear that regional or local development plans exist in southern Nye County. The maximum annual water use for the repository would be only 3.3 percent of the sustainable yield of aquifers in the Amargosa Desert ground-water basin as defined by the State Engineer. This figure includes an estimated 86,000 gallons of water per day for dust suppression. The majority of the water will evaporate from the surface with minimal infiltration to the subsurface. The pumping history for Well J-13, which is likely to supply water to the repository, shows that lowering of the water table will probably be negligible.

Issue: Ground-water conditions

Seven comments relating to ground-water conditions within and above the potential repository host rock were received. The commenters suggested that further hydrologic investigations be conducted to determine the potential for perched water above the repository zone and the possibility that evaporation ponds will become recharge sources. There were also concerns relative to travel times of surface runoff from storm events to subsurface work tunnels, and the effects of a repository on the regional ground-water system.

Response

Further studies during site characterization will enhance understanding of the Death Valley ground-water system. These studies will also clarify whether a zero-discharge facility can be maintained. Evaporation ponds and storage piles will be lined to prevent infiltration of effluents into the local ground-water system. The travel time of surface runoff into subsurface work tunnels differs from most other systems in the case of Yucca Mountain since the overlying rocks are unsaturated. The very low moisture content in the potential host rock indicates that water traveling in a single fracture would quickly be pulled into the matrix pore space.

Further drilling during site characterization will provide more information on the potential for perched water. Should any perched water be encountered, it would be pumped or drained. The DOE has revised the final EA to include a discussion on the possibility of perched water.

C.8.4 PRECLOSURE TECTONICS

Twenty-four comments were submitted addressing the potential effects of tectonic processes and events on the preclosure of surface and underground facilities at Yucca Mountain. Several reviewers suggested changes of words and references presented in the draft Environmental Assessment (EA). A request was made that phrases indicating a similarity of design requirements for nuclear power plants and nuclear waste repositories be altered. A suggestion was made that the volcanic hazard during the preclosure time frame be more thoroughly examined. Concern was expressed that not all faults at Yucca Mountain have been satisfactorily examined and that strike-slip faulting in particular was largely overlooked in the EA. One commenter pointed out that estimates of acceleration at the site due to earthquakes on nearby faults were computed with outdated attenuation curves and relationships between fault length and event magnitude. Another commenter suggested that underground damage is very unlikely to result from surface accelerations less than 0.5g. Arguments were made against the U.S. Department of Energy (DOE) position that the second and third potentially adverse conditions listed in the EA are not present at the site. The second potentially adverse condition states that reasonable design requirements may be exceeded if historical earthquakes or underground nuclear explosions recur. The third potentially adverse condition states that tectonic evidence suggests a possibility that the magnitude of an earthquake occurring during operation of the surface facility (approximately the next 90 years) could exceed the magnitude

predicted on the basis of the historical seismic record. One commenter suggested that concern about tectonics should cover a longer time period, and another requested consideration of the potential for excavation-induced seismicity. Finally, four reviewers challenged the EA finding on the disqualifying condition (i.e., that the evidence does not suggest that engineering measures beyond reasonably available technology will be necessary for exploratory shaft construction or for repository construction, operation, or closure).

Response

Seismic design requirements for structures important to repository operation and personnel safety will comply with 10 CFR Part 60 and appropriate U.S. Environmental Protection Agency regulations. It is premature to state that requirements for the design of nuclear power plants are the same as those to be applied to a waste repository (Nuclear Regulatory Commission Comment 6-110 on Yucca Mountain Draft EA) (NRC, 1985). A summary of plans and methodology that will be used in developing seismic design criteria for the Yucca Mountain site was added to the final EA text in Section 6.3.3.4.5.

Earthquake recurrence intervals based on a preliminary copy of Carr (1984) have been deleted because of a change in the supporting document. Igneous activity at or near the site within the next 90 years is highly unlikely. Small volume basaltic volcanism is thought to be the most likely form of future volcanism in the southern Great Basin. The probabilities of volcanic activity are thoroughly discussed in Section 6.3.1.7.3 in the favorable condition evaluation. Exhumation of a repository by explosive cratering associated with hydrovolcanism is unlikely; the depth of burial of the repository is about four times the depth of craters formed by such processes (Crowe, 1985). The most recent probability calculations for the eruption of basalts at the site are on the order of 1 chance in 20 million to 1 chance in 3 billion per year (USGS, 1984).

Further consideration has been given in the final EA to the nature of strike-slip faulting in the vicinity of the site. Also, the nature and probability of movement of strike-slip and normal faults will be extensively studied during site characterization. The 0.4g acceleration that was estimated on the basis of a 6.8 magnitude earthquake on the Bare Mountain Fault (USGS, 1984) will not constitute the primary seismic risk estimate for Yucca Mountain. As discussed in Section 6.3.3.4.5, seismic design experts will evaluate the potentially active faults near the site to establish those that should be considered as potential seismogenic sources for repository design purposes. A table that provides estimates of acceleration as a function of earthquake magnitudes and distance from a fault has been added to Section 6.3.3.4.5 of the final EA. The fault rupture length required to produce a given earthquake magnitude is also included in the table. This table can be used to estimate the expected accelerations at the site if fault lengths and locations are known. However, the attenuation relationships provided are regional rather than site-specific.

Recurrence intervals for major earthquakes were compiled from a number of sources and are presented in Section 6.3.1.7.5. For earthquake magnitudes greater than or equal to 7, the recurrence interval for the Nevada Test Site

(NTS) region, from estimates in the literature, is on the order of 25,000 years; for earthquake magnitudes of greater than or equal to 6, the recurrence interval is estimated to be on the order of 2,500 years; and for earthquake magnitudes greater than or equal to 5, the recurrence intervals are about 250 years. Two historic earthquakes within the East-West Seismic Belt had magnitudes of 6, with the closer occurring in 1908 at a location 110 kilometers (68 miles) southwest of Yucca Mountain. For purposes of evaluation of the third potentially adverse condition on evidence for higher-magnitude earthquakes than predicted from historical seismicity, it is assumed that the likelihood of a larger-than-historic event in the preclosure period (90 years) is low. Revisions to the text in the final EA explain the basis for this assumption.

Through July 1985, in a 4-year period of intensive monitoring, three microearthquakes with magnitudes less than 2 have been located within 2 kilometers (1.2 miles) of the Yucca Mountain near-field seismic network (approximately 5 kilometers (3 miles) by approximately 10 kilometers (6 miles), roughly centered on drill hole USW G-4). No historic earthquakes with determinable magnitudes greater than 3.6 have occurred within 10 kilometers (6 miles) of the site. Consideration of seismic data over a broader region, including several major earthquakes that have occurred within 350 kilometers (210 miles) of the site (USGS, 1984), ensures that the seismic potential of the site is not being underestimated. In situ stress measurements indicate that the local stress field is consistent with that throughout the Basin and Range (USGS, 1984) and that future slip may be more likely to occur on north- to northeast-trending fault planes. It should be noted that the attenuation curves that were used to estimate ground motion at the site, due to earthquakes in the vicinity (USGS, 1984), are outdated and were based largely on surface measurements of California events.

The ability of subsurface structures near the NTS to withstand strong ground motions is demonstrated by the many tunnels at Rainier Mesa which remain open and stable through extensive disturbances from both naturally occurring earthquakes as well as nearby underground nuclear explosions (Section 6.3.1.3). Extraordinary measures are not required throughout the region to cope with seismicity, as is the case in some parts of the world where development spans highly active tectonic plate margins (e.g., Japan, California, western South America). The EA text in Section 6.3.3.4.5 has been revised to explain the basis for claiming that reasonably available technology is sufficient to construct and operate a repository at Yucca Mountain. The text includes a review of design options that have been used for other facilities to accommodate strong ground motion and displacements. A major discussion was also added to Section 6.3.3.4.5 on the methodology that will be used by the Nevada Nuclear Waste Storage Investigations Project for assessing the significance of seismic and tectonic events, both for the preclosure and postclosure periods.

C.8.5 SYSTEM GUIDELINE

No comments were received in this category.

REFERENCES FOR CHAPTER C.8

- Carr, W. J., 1984. Regional Structural Setting of Yucca Mountain, Southwestern Nevada, and Late Cenozoic Rates of Tectonic Activity in Part of the Southwestern Basin, Nevada and California, USGS-OFR-84-854, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Crowe, B. M., K. H. Wohletz, D. T. Vaniman, and E. Gladney, 1985. Volcanic Hazard Studies for the Nevada Nuclear Waste Storage Investigations: Part II, Los Alamos National Laboratory, Los Alamos, N. Mex.
- Healy, J. H., S. H. Hickman, M. D. Zoback, and W. L. Ellis, 1984. Report on Televiwer Log and Stress Measurements in Core Hole USW-G1, Nevada Test Site, December 13-22, 1981, USGS-OFR-84-15, Open-File Report, U.S. Geological Survey, Menlo Park, Calif.
- Hustrulid, W., 1984. Lining Considerations for a Circular Vertical Shaft in Generic Tuff, SANDB3-7088, Sandia National Laboratories, Albuquerque, N. Mex.
- Johnstone, J. K., R. R. Peters, and P. F. Gnirk, 1984. Unit Evaluation at Yucca Mountain, Nevada Test Site: Summary Report and Recommendation, SAND83-0372, Sandia National Laboratories, Albuquerque, N. Mex.
- Lipman, P. W., and E. J. McKay, 1985. "Geologic Map of the Topopah Spring SW Quadrangle, Nye County, Nevada," U.S. Geological Survey Quadrangle Map GQ-439, Scale 1:24,000, Washington, D.C.
- Maldonado, F., and S. L. Koether, 1983. Stratigraphy, Structure, and Some Petrographic Features of Tertiary Volcanic Rocks at the USW G-2 Drill Hole, Yucca Mountain, Nye County, Nevada, USGS-OFR-83-732, Open-File Report, U.S. Geological Survey, Denver, Colo., 83 p.
- Mansure, A. J., and T. S. Ortiz, 1984. Preliminary Evaluation of the Subsurface Area Available for a Potential Nuclear Waste Repository at Yucca Mountain, SAND84-0175, Sandia National Laboratories, Albuquerque, N. Mex.

- NRC (U.S. Nuclear Regulatory Commission), 1985. NRC Comments on DOE Draft Environmental Assessment for Yucca Mountain Site, March 20, 1985.
- Ortego, P. K., 1985. Letter from P. K. Ortego (F&S) to J. J. D'Lugosz (DOE/NVO), ADM-9415, September 17, 1985; regarding NTS ground support experience.
- Scott, R. B. and M. Castellanos, 1984. Stratigraphic and Structural Relations of Volcanic Rocks in Drill Holes USW GU-3 and USW G-3, Yucca Mountain, Nye County, Nevada, USGS-OFR-84-491, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Spengler, R. W., and M. P. Chornack, 1984. Stratigraphic and Structural Characteristics of Volcanic Rocks in Core Hole USW G-4, Yucca Mountain, Nye County, Nevada, with a section of geophysical logs by D. C. Muller and J. E. Kibler, USGS-OFR-84-789, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Spengler, R. W., F. M. Byers, Jr., and J. B. Warner, 1981. Stratigraphy and Structure of Volcanic Rocks in Drill Hole USW G-1, Yucca Mountain, Nye County, Nevada, USGS-OFR-81-1349, Open-File Report, U.S. Geological Survey, Denver, Colo.
- Squires, R. R., and R. L. Young, 1984. Flood Potential of Fortymile Wash and Its Principal Southwestern Tributaries, Nevada Test Site, Southern Nevada, USGS-WRI-83-4001, Water-Resources Investigations Report, U.S. Geological Survey, Carson City, Nev.
- Stock, J. M., J. H. Healy, and S. H. Hickman, 1984. Report on Televiewer Log and Stress Measurements in Core Hole USW G-2, Nevada Test Site, October-November 1982, USGS-OFR-84-172, U.S. Geological Survey, Menlo Park, Calif.
- Tibbs, H., 1985. Letter from H. Tibbs (F&S) to J. J. D'Lugosz (DOE/NVO), September 23, 1985; regarding mining experience through faulted welded tuff beds in U12G Tunnel "Rock Mechanics" drift.

Tillerson, J. R., and F. B. Nimick, 1984. Geoengineering Properties of Potential Repository Units at Yucca Mountain, Southern Nevada, SAND84-0221, Sandia National Laboratories, Albuquerque, N. Mex.

USGS (U.S. Geological Survey), 1981. Topopah Spring SW Quadrangle Map, Nevada-Nye County, U.S. Geologic Survey 7.5 minute series (Topographic), Denver, Colo.

USGS (U.S. Geological Survey) (comp.), 1984. A Summary of Geologic Studies through January 1, 1983, of a Potential High-Level Radioactive Waste Repository Site at Yucca Mountain, Southern Nye County, Nevada, USGS-OFR-84-792, Open-File Report, U.S. Geological Survey, Menlo Park, Calif.

CODES AND REGULATIONS

10 CFR Part 60 (Code of Federal Regulations), 1983. Title 10, "Energy," Part 60, "Disposal of High-Level Radioactive Wastes in Geologic Repositories," U.S. Government Printing Office, Washington, D.C.

10 CFR Part 960 (Code of Federal Regulations), 1984. Title 10, "Energy," Part 960, "General Guidelines for the Recommendation of Sites for Nuclear Waste Repositories; Final Siting Guidelines," 49 FR 47714, Vol. 49, No. 236, December 6, 1984, pp. 47714-47769.

C.9 COMMENT-RESPONSE INDEX

In its Federal Register notice of December 20, 1984, announcing the availability of the draft EAs, the DOE requested that interested parties review the documents and send their comments to the DOE in Washington, D.C. for the comment record. In addition, the DOE held a series of public hearings in the six first-repository States and one adjacent State. The written and oral testimony from these hearings was also included in the formal comment record.

Each letter and the testimony of each hearing participant were assigned a number. The letters and testimony were then reviewed to identify comments, and the comments in each letter were numbered sequentially. Copies of the comments and letters can be seen at the DOE reading rooms in Washington, D.C.; Columbus, Ohio; Las Vegas, Nevada; and Richland, Washington. The individual comments were assigned a classification code that corresponds to a subject area in the comment-response document (CRD). In some cases, a comment was addressed in more than one subject area in the CRD, and these comments were assigned more than one classification code.

This index lists all of the comments that apply to the Yucca Mountain draft EA. By using this index, the commenter can find the section of the CRD that discusses the issues raised in his or her comment letter or testimony at a public hearing. The commenters are listed by State. The index lists the commenters alphabetically by their last name, their organizational affiliation where applicable, the number assigned to the letter or testimony, the comment numbers, and the classification number for that comment. If the issues raised by the comment are discussed in more than one section of the CRD, additional classification numbers were assigned and are listed in the second, third, and fourth classification columns. Up to four classifications can be listed for each comment.

Thus, to see how the DOE classified the comments and responded to the issues raised in your comment letter or hearing testimony, look up your name under the listing from your State. Under the comment column number you will find a list of the comments the DOE identified in your letter. In the classification column find the classification number(s) assigned to that comment. The classification numbers refer to the sections of the CRD, and the CRD Table of Contents will show the page numbers for the section that discusses the issues raised by your comments.

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Alabama								
	Leonard, R. Michael		02077	00001	C.3.1.2	--	--	--
			02077	00002	C.3.4.4	--	--	--
			02077	00005	C.3.4.4	--	--	--
Arkansas								
	Matz, Mike		00306	00001	C.3.1.2	--	--	--
Arizona								
	Campugano, Elizabeth	Friends Southwest Center	00175	00002	C.3.1.2	--	--	--
	Connolly, Marjorie		02675	00001	C.3.1.2	--	--	--
			02675	00003	C.3.1.2	--	--	--
	Coxhead, Richard A.		00409	00001	C.3.4.4	--	--	--
	Dankwort, Rudolf		00413	00001	C.3.4.4	--	--	--
			00413	00002	C.3.4.2.2	--	--	--
	Dugall, Dr. John C.		00104	00001	C.3.4.4	--	--	--
			00104	00003	C.3.4.4	--	--	--
	Evans, Arthur H.		00096	00001	C.3.4.4	--	--	--
	Findlay, III, Robert S.		00253	00001	C.3.4.4	--	--	--
	Hill, Richard C.		01347	00006	C.3.4.4	--	--	--
	Kissock, Kelly	Verde Valley School, Math dept.	01533	00001	C.3.1.2	--	--	--
			01533	00002	C.3.1.2	--	--	--
			01533	00003	C.3.1.2	--	--	--
	Lawson, Duane		01313	00001	C.3.1.2	--	--	--
			01313	00004	C.3.1.2	--	--	--
			01313	00005	C.3.4.4	--	--	--
	Lundquist, Evelyn		01084	00001	C.3.4.4	--	--	--
	Lundstrom, Kristen		00067	00001	C.3.1.2	--	--	--
	McCarty, Doug		00223	00004	C.2.4.1	--	--	--
			00223	00006	C.2.8.1	--	--	--
			00223	00007	C.3.4.3	--	--	--
	McClelland, Brian K.		01353	00001	C.3.4.4	--	--	--
			01353	00002	C.3.4.4	--	--	--
			01353	00004	C.2.1.2	--	--	--
	O'Neill, Colleen		00329	00003	C.3.1.2	--	--	--
	Vicini, Linda M.		00244	00001	C.3.4.4	--	--	--
	Winter, John T.		00310	00001	C.3.1.2	--	--	--
			00310	00003	C.3.4.4	--	--	--

C.9-3

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
California								
	Anonymous		00106	00001	C.3.4.4	--	--	--
	Bacher Jr., Mrs. Frederick A.		00101	00001	C.3.1.2	--	--	--
			00101	00005	C.3.4.4	--	--	--
	Ballsun, C.		00075	00001	C.3.4.4	--	--	--
	Berke, Eleanor		00351	00001	C.3.4.4	--	--	--
			00351	00002	C.3.1.2	--	--	--
	Bock, A.J.	American Rock Art Research Assc.	01056	00001	C.3.4.4	--	--	--
	Bridenbecker, Robert H.	Southern CA Edison Co.	01351	00001	C.2.3.3	--	--	--
			01351	00002	C.4.1	C.2.7	--	--
			01351	00003	C.4.3	C.4.3	--	--
			01351	00004	C.4.3	C.4.3	--	--
			01351	00005	C.2.8.3	C.4.3	--	--
			01351	00006	C.2.4.1	--	--	--
	Cameron, Lillian S.		00115	00001	C.3.4.4	--	--	--
			00115	00005	C.3.4.4	--	--	--
	Campbell, Todd		00267	00001	C.3.4.4	--	--	--
	Durbin, Emily	Sierra Club	01221	00001	C.4.1.2.2	--	--	--
			01221	00002	C.5.4	--	--	--
			01221	00003	C.4.1.2.2	--	--	--
			01221	00004	C.6.4	--	--	--
			01221	00005	C.5.7	--	--	--
			01221	00006	C.4.1.3.3	--	--	--
			01221	00007	C.4.1.3.3	--	--	--
			01221	00008	C.4.1.3.2	--	--	--
			01221	00009	C.3.1.2	--	--	--
	Geisler, Dorothy		00073	00001	C.3.4.4	--	--	--
			00073	00004	C.3.4.4	--	--	--
			00073	00005	C.2.8.1	--	--	--
	Goodman, Michael		00222	00001	C.3.4.4	--	--	--
			00222	00002	C.2.8.3	--	--	--
	Gross, Caroline		00225	00001	C.2.8.1	--	--	--
			00225	00002	C.3.1.2	--	--	--
	Gunsky, Frederic R.		00068	00001	C.3.3.1	--	--	--
	Holladay, Kevin		01060	00001	C.3.1.2	--	--	--
			01060	00002	C.3.4.4	--	--	--
	Jett, Dr. Stephen C.	Univ. Cal. Geog. Dept	00016	00002	C.3.4.4	--	--	--
	Jones-Johnson, Ola Mae		00027	00001	C.3.4.4	--	--	--
	Jones-Smith, Aree		00023	00001	C.3.4.4	--	--	--

G.9-4

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>California (continued)</u>								
	Jones-Smith, Willie Lou		00032	00001	C.3.4.4	--	--	--
	Lundholm, Mrs. A. N.		02108	00001	C.2.5.2	--	--	--
	Martin, Frankie and Bob		00107	00001	C.3.4.4	--	--	--
	McCreery, Scott		01133	00001	C.3.4.4	--	--	--
	Mitchell, Mrs. Barbara A.		00179	00005	C.3.1.2	--	--	--
	Moore, Carey		00019	00001	C.3.4.4	--	--	--
	Moore, Willie		00025	00001	C.3.4.4	--	--	--
	Moore, Kelvin		00033	00001	C.3.4.4	--	--	--
	Moore, Sr., Albert B.		00018	00001	C.3.4.4	--	--	--
	Moore-Loud, Gloria D.		00039	00001	C.3.4.4	--	--	--
	Moore-Parker, Laura		00024	00001	C.3.4.4	--	--	--
	Moore-Robinson, Annie		00026	00001	C.3.4.4	--	--	--
	Oman, Barbara		02704	00001	C.3.1.2	--	--	--
			02704	00002	C.3.4.4	--	--	--
	Parkins, Cheryl		01062	00001	C.3.4.4	--	--	--
	Patterson, Wendy Bents		02610	00001	C.3.1.2	--	--	--
			02610	00003	C.3.1.2	--	--	--
	Poland, Roscoe A.	Conservation Call	00198	00002	C.3.1.2	--	--	--
	Preyer, Bernard		02700	00001	C.3.4.4	--	--	--
			02700	00002	C.3.1.2	--	--	--
	Ramsey, Rande		01194	00003	C.3.1.2	--	--	--
			01194	00004	C.7.1	--	--	--
	Ready, James P.	The James P. Ready Co.	01577	00001	C.3.1.2	--	--	--
	Rittenhouse, Jan		00328	00002	C.3.1.2	--	--	--
	Robertson, Marilyn		01579	00001	C.3.4.4	--	--	--
	Ryall, Marjorie M.		00117	00001	C.3.4.4	--	--	--
			00117	00006	C.3.4.4	--	--	--
	Saretsky, Richard D.		00279	00002	C.3.1.2	--	--	--
	Sawyer, Benjamin		02701	00001	C.3.4.4	--	--	--
			02701	00002	C.3.1.2	--	--	--
			02701	00003	C.2.8.1	--	--	--
	Schuster, Megan H.		00439	00002	C.3.1.2	--	--	--
	Skews, Geoff		00133	00005	C.3.1.2	--	--	--
	Stansfield, Elaine	Ecology Ctr. of So. California	00059	00001	C.3.4.4	--	--	--
			00059	00002	C.2.1.1	--	--	--
			00059	00003A	C.2.7	--	--	--
			00059	00003B	C.3.4.2.1	--	--	--
			00059	00038	C.2.8.1	C.2.8.2	--	--

C.9-5

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
California (continued)								
	Swanson, John R. Wasson, Glenn E.		00446	00001	C.3.4.4	--	--	--
			00254	00001	C.5.7	--	--	--
			00254	00002	C.3.1.3	--	--	--
			00254	00003	C.3.4.4	--	--	--
			00254	00004	C.2.3.1	--	--	--
			00254	00005	C.2.6.1	--	--	--
			00254	00006	C.2.8	--	--	--
			00254	00007	C.2.1	--	--	--
			00254	00008	C.3.4.4	--	--	--
			00254	00009	C.5.7	--	--	--
			00254	00010	C.5.7	--	--	--
			00254	00011	C.2.8.2	--	--	--
			00254	00012	C.2.8.2	--	--	--
			00254	00013	C.2.8.2	--	--	--
	Weatherwax, Robert K.	Sierra Energy & Risk Assessment	01366	00001	C.3.4	--	--	--
			01366	00002	C.3.4.3	--	--	--
			01366	00003	C.3.4.3	--	--	--
			01366	00004	C.3.4	--	--	--
			01366	00005	C.3.4.3	--	--	--
			01366	00006	C.3.4.2	--	--	--
			01366	00007	C.3.4.3	--	--	--
			01366	00008	C.3.4.3	--	--	--
			01366	00009	C.3.3	--	--	--
			01366	00010	C.3.4.1	--	--	--
			01366	00011	C.3.4.3	--	--	--
	Webster, Donald B.		00613	00001	C.3.4.4	--	--	--
	Yasuda, Don		00443	00001	C.3.4.4	--	--	--
	York, Jennifer		00060	00001	C.2.8.1	--	--	--
			00060	00001A	C.3.1.2	--	--	--
			00060	00001B	C.2.7	--	--	--
Colorado								
	Adams, Cass		01178	00001	C.3.4.4	--	--	--
	Adams, Craig		01304	00001	C.3.1.2	--	--	--
			01304	00002	C.2.2	--	--	--
	Anderson, John and Leanna		00527	00003	C.3.1.2	--	--	--
	Anderson, Virginia S.		00581	00001	C.3.1.2	--	--	--

9-6-C

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Colorado (continued)								
	Anderst, Daryl		00318	00001	C.3.1.2	--	--	--
	Andy, Charles		00562	00001	C.2.1.1	--	--	--
	Anonymous		01184	00001	C.3.1.2	--	--	--
	Auerlah, Catherine E.		00601	00001	C.3.4.4	--	--	--
	Bartley, Ben		00565	00001	C.3.4.4	--	--	--
	Bedwell, Jackie		00636	00001	C.3.4.4	--	--	--
			00636	00002	C.3.4.4	--	--	--
	Below, Joan A.		00594	00001	C.3.1.2	--	--	--
	Benjamin, Laurie		00350	00001	C.3.4.4	--	--	--
	Bennett, Sandy		01049	00001	C.3.1.2	--	--	--
	Bernard, Joan		00307	00001	C.3.1.2	--	--	--
	Bertram, Diane		00410	00001	C.3.4.4	--	--	--
	Biggers, John		01371	00002	C.3.1.2	--	--	--
	Binkowski, David J.		00634	00002	C.7.1	--	--	--
	Bloom, Claudia		00260	00002	C.3.4.4	--	--	--
	Bly, Karel S.		01141	00001	C.3.1.2	--	--	--
	Bomer, Frances		00559	00001	C.3.1.2	--	--	--
	Borkovec, Rick		01256	00001	C.3.1.2	--	--	--
			01256	00003	C.3.1.2	--	--	--
	Borowski, Ann		01377	00002	C.3.1.2	--	--	--
	Borton, Perry		01334	00002	C.3.1.3	--	--	--
	Boss, Roger		01336	00002	C.3.1.3	--	--	--
	Boyce, Cheryl		00584	00001	C.3.1.2	--	--	--
	Brainerd, Alice		00346	00001	C.3.4.4	--	--	--
			00346	00002	C.2.8.1	--	--	--
	Breazzano, Debra		00558	00001	C.3.1.2	--	--	--
	Brown, Keri		00596	00001	C.3.1.2	--	--	--
	Burpee, Elizabeth		00586	00003	C.2.8.1	--	--	--
	Byerly, Alan		00549	00001	C.3.1.2	--	--	--
	Byerly, Gay Porter		01303	00001	C.3.1.2	--	--	--
			01303	00002	C.3.1.2	--	--	--
			01303	00003	C.3.1.2	--	--	--
	Carney, Jerry & Jennifer S.		00078	00001	C.3.4.4	--	--	--
			00078	00007	C.3.1.2	--	--	--
			00078	00009	C.3.4.4	--	--	--
	Clark, Caroline		01349	00001	C.3.1.2	--	--	--
	Coff, Harry E.		01182	00003	C.2.1.1	--	--	--
	Cole, Sally J.		01138	00001	C.3.1.2	--	--	--

C.9-7

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Colorado (continued)								
	Cook, Jane M.		01138	00003	C.3.1.2	--	--	--
	Cooper, Sandra H.		00607	00001	C.3.4.4	--	--	--
	Cunningham, Hartley, Timothy & Janice		00660	00004	C.3.1.2	--	--	--
	Dailey, Carolyn J.	Fort Lewis College	00385	00003	C.3.4.4	--	--	--
			00655	00001	C.3.4.4	--	--	--
	Dobben, Talie		00655	00003	C.3.1.2	--	--	--
	Dowell, Bill, Marcia & Ryan		01046	00001	C.3.1.2	--	--	--
			01546	00001	C.3.1.2	--	--	--
			01546	00002	C.3.1.2	--	--	--
	Dyson, Rick		01064	00001	C.3.1.2	--	--	--
	Engman, Shelley		00572	00001	C.3.1.2	--	--	--
	Ewert, Daniel, Alex & Krista		01559	00001	C.3.4.4	--	--	--
	Farnsworth, Pam		00441	00001	C.3.1.2	--	--	--
			00441	00002	C.3.1.2	--	--	--
	Fay, Thomas		01223	00001	C.3.1.2	--	--	--
			01223	00002	C.3.1.2	--	--	--
	Fay, Janet M.		02255	00001	C.3.1.2	--	--	--
	Ferst, F.		01185	00002	C.3.1.2	--	--	--
			01185	00003	C.2.3	--	--	--
			01185	00004	C.2.3	--	--	--
	Fitzpatrick, Jr., Joseph W.		01309	00001	C.3.1.2	--	--	--
			01309	00003	C.3.1.2	--	--	--
	Fogarty, Steven		00569	00001A	C.3.4.4	--	--	--
			00569	00001D	C.3.4.4	--	--	--
	Fogg, Peter L.		01123	00002	C.2.4.1	--	--	--
			01123	00004	C.3.1.2	--	--	--
			01123	00006	C.3.1.2	--	--	--
			01123	00008	C.3.1.2	--	--	--
			01123	00009	C.3.1.1	--	--	--
			01123	00010	C.2.7	--	--	--
			01123	00011	C.3.4.4	--	--	--
	Fowler, Catherine		00566	00001	C.3.1.2	--	--	--
	Fowler, Jessica		00606	00001	C.3.4.4	--	--	--
	Fox, Genevieve		00577	00001	C.3.4.4	--	--	--
			00577	00002	C.3.1.2	--	--	--
	Frankel, Miriam		01345	00004	C.2.4.1	--	--	--
	Friedman, Margaret		00615	00001	C.3.4.4	--	--	--
	Friedman, Jonathan		01089	00001	C.3.4.4	--	--	--

C-6-8

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Colorado (continued)								
	Geraghty, Matt		00428	00001	C.3.1.2	--	--	--
	Gibbons, Mary Jo & John		01561	00001	C.3.4.4	--	--	--
	Gobhardt, Larry		01375	00002	C.3.1.2	--	--	--
	Goodtimes, Art	Telluride Times	02186	00001	C.3.4.4	--	--	--
	Goswick, Jeffrey		00603	00001	C.3.4.4	--	--	--
			00603	00002	C.2.8.2	--	--	--
	Gray, Douglas E.		01179	00001	C.3.1.2	--	--	--
	Grayson, Marie		00085	00001	C.3.1.2	--	--	--
			00085	00002	C.3.1.2	--	--	--
	Green, Douglas J.		00654	00001	C.2.8.2	--	--	--
			00654	00002	C.3.4.4	--	--	--
	Gregory, Lee		00215	00001	C.3.4.4	--	--	--
	Gronwall, Raymond J.		00348	00001	C.3.1.2	--	--	--
			00348	00005	C.2.4.1	--	--	--
			00348	00006	C.2.4.1	--	--	--
	Groth, Mark and Kathy		00414	00002	C.3.1.2	--	--	--
	Groves, Anthony		01176	00001	C.3.1.2	--	--	--
			01176	00003	C.3.1.2	--	--	--
	Gruer, Mary K.		01177	00001	C.3.4.4	--	--	--
	Gudavski, LeCindra		00545	00001	C.3.1.2	--	--	--
	Hackl, Diane		00602	00001	C.3.4.4	--	--	--
	Hannegan, Jr., David W.		01159	00005	C.2.8.2	--	--	--
			01159	00006	C.2.8.1	--	--	--
	Hart, Robert L. & Linda P.		00289	00001	C.3.1.2	--	--	--
	Hassan, Peter C.		00637	00002	C.3.4.4	--	--	--
	Heitzer, Mark		01330	00002	C.3.1.3	--	--	--
	Hempel, Paul		01189	00001	C.3.1.2	--	--	--
	Hinchman, John S.	Bent, St. Vrain Partners Inc.	01310	00001	C.3.1.2	--	--	--
			01310	00002	C.3.1.2	--	--	--
			01310	00003	C.3.1.2	--	--	--
	Hines, LeAnne		00444	00001	C.3.4.4	--	--	--
	Humphrey, Peter		02075	00005	C.3.4.4	--	--	--
	Jackson, Cathy		01332	00002	C.3.1.3	--	--	--
	Jernigan, Richard		01257	00001	C.3.1.2	--	--	--
			01257	00003	C.3.1.2	--	--	--
	Johnson, Nina		00371	00001	C.3.1.2	--	--	--
	Johnson, Misti		01255	00001	C.3.1.2	--	--	--
			01255	00003	C.3.1.2	--	--	--

C.9-9

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Colorado (continued)								
	Jones, Charles A.	Allied Bendix Aerospace	02660	00001	C.2.7	--	--	--
	Kaempfer, Suzanne H.		00013	00001	C.3.1.2	--	--	--
			00013	00004	C.3.4.4	--	--	--
	Kapushion, Nettie		01376	00002	C.3.1.2	--	--	--
	Kelly, Allen L.		02078	00002	C.3.4.4	--	--	--
	Kiklevich, Roark, Eric & Abby		01548	00001	C.3.1.2	--	--	--
			01548	00002	C.3.1.2	--	--	--
	Kinnear, Sharyl A.		01137	00001	C.2.2.1	--	--	--
			01137	00005	C.2.4.1	--	--	--
	Kirk, Allison		01059	00001	C.3.4.4	--	--	--
			01059	00003	C.3.4.4	--	--	--
			01059	00004	C.2.4.1	--	--	--
	Kornreich, Scott K.		01225	00002	C.3.1.2	--	--	--
	Kovanic, Ronald		01374	00002	C.3.1.2	--	--	--
	Kurtz, Frederick W.		01254	00001	C.3.1.2	--	--	--
			01254	00003	C.3.1.2	--	--	--
	Kurtz, Robyn		01378	00002	C.3.1.2	--	--	--
	Lamm, Governor Richard	State of Colorado	01398	00001	C.2.4.1	--	--	--
			01398	00002	C.2.4.1	--	--	--
			01398	00003	C.2.4.1	--	--	--
			01398	00004	C.3.4.3	--	--	--
			01398	00005	C.2.4.1	--	--	--
			01398	00006	C.2.4.1	C.7.3	--	--
			01398	00007	C.3.4.2.2	--	--	--
			01398	00008	C.2.4.1	--	--	--
			01398	00009	C.2.4.1	--	--	--
			01398	00010	C.2.4.1	--	--	--
	Landing, Sharon A.		00415	00001	C.3.4.4	--	--	--
	Larsen, Suzanne		01204	00001	C.3.1.2	--	--	--
			01204	00003	C.3.1.2	--	--	--
	Lehman, Dale E.	Fort Lewis College	00118	00001	C.2.1.1	--	--	--
			00118	00002A	C.3.4.3	--	--	--
			00118	00002B	C.2.1.1	--	--	--
			00118	00002C	C.2.1.1	--	--	--
			00118	00004	C.3.4.4	--	--	--
			00118	00006	C.3.4.2.2	--	--	--
			00118	00007	C.3.4.2.2	--	--	--
	Lehmann, Scott K.	Univ. of Colorado, Boulder	00503	00001	C.3.1.2	--	--	--

C.9-10

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Colorado (continued)								
	Lucas, David		00503	00005	C.3.1.2	--	--	--
			00503	00006	C.3.4.4	--	--	--
			00405	00001	C.3.4.4	--	--	--
			00405	00003	C.3.1.2	--	--	--
	H., D.		00639	00001	C.2.8.1	--	--	--
	Magyar, John and Mike		02661	00001	C.3.4.4	--	--	--
			02661	00007	C.3.1.2	--	--	--
	Margolis, Barbara E.		00082	00001	C.3.4.4	--	--	--
	Marsh, Tobin		00571	00002	C.3.1.2	--	--	--
	Marshall, Katherine J.		00548	00001	C.3.1.2	--	--	--
	Martin, James B.	Environmental Defense Fund	01259	00001	C.2.1.1	--	--	--
			01259	00002	C.2.4.1	--	--	--
			01259	00003	C.2.4.1	--	--	--
			01259	00004	C.2.4.1	--	--	--
			01259	00005	C.3.1.2	--	--	--
			01259	00006	C.3.1.2	--	--	--
			01259	00007	C.2.4.1	--	--	--
			01259	00008	C.2.4.1	--	--	--
			01259	00009	C.2.4.1	--	--	--
			01259	00010	C.5.7	--	--	--
			01259	00011	C.2.4.1	--	--	--
			01259	00012	C.2.4.1	--	--	--
			01259	00013	C.2.4.1	--	--	--
			01259	00014	C.2.4.1	--	--	--
			01259	00015	C.2.4.1	--	--	--
			01259	00016	C.2.4.1	--	--	--
			01259	00017	C.2.4.1	--	--	--
			01259	00018	C.2.4.1	--	--	--
			01259	00019	C.2.4.1	--	--	--
			01259	00020	C.2.4.1	--	--	--
			01259	00021	C.2.4.1	--	--	--
			01259	00022	C.2.4.1	--	--	--
	Mattina, Carol		01047	00001	C.3.1.2	--	--	--
	Mattox, Paul		00638	00001	C.3.1.2	--	--	--
	May, Jeffrey		00311	00001	C.3.4.4	--	--	--
			00311	00003	C.3.4	--	--	--
	Maynard, Andrea G.		00153	00001	C.3.1.2	--	--	--
	McCool, Lewis		02182	00001	C.3.4.4	--	--	--

0.9-11

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Colorado (continued)</u>								
			02182	00005	C.7.2	--	--	--
			02182	00006	C.7.2	--	--	--
			02182	00007	C.7.2	--	--	--
	McFarland, Kristy		01287	00001	C.3.4.4	--	--	--
	McNabb, Donald		01145	00001	C.3.4.4	--	--	--
	McLellan, Rosalind		01331	00002	C.3.1.3	--	--	--
	Mears, Mike		01547	00001	C.3.1.2	--	--	--
			01547	00002	C.3.1.2	--	--	--
	Hiller, Kathy		01063	00001	C.3.1.2	--	--	--
	Monash, Jessica		02611	00001	C.3.1.2	--	--	--
			02611	00003	C.3.1.2	--	--	--
			02611	00019	C.3.4	--	--	--
	Montfredo, Steven		01373	00002	C.3.1.2	--	--	--
	Morehouse, Don		01312	00001	C.3.1.2	--	--	--
			01312	00002	C.3.1.2	--	--	--
	Muhlbeim, Robert John		00319	00001	C.3.1.2	--	--	--
			00319	00002	C.3.1.2	--	--	--
	Muller, Fred R.		01180	00001	C.3.4.4	--	--	--
	Mullhauser, Amy		00658	00001	C.3.4.4	--	--	--
	Nabil, David		01572	00001	C.3.1.2	--	--	--
			01572	00002	C.3.1.2	--	--	--
	Natting, Elizabeth		02257	00001	C.3.4.4	--	--	--
	Najaft, Melinda		00561	00001	C.3.1.2	--	--	--
	Nall, Chris		00354	00001	C.3.4.4	--	--	--
			00354	00002	C.3.1.2	--	--	--
	Nichell, David		00568	00001	C.3.1.2	--	--	--
	Nowlin, Dawn		01329	00002	C.3.1.3	--	--	--
	Oberling, Bill		01562	00001	C.3.4.4	--	--	--
	Palmer, Alice G. & Mark F.		01318	00001	C.3.1.2	--	--	--
			01318	00003	C.3.1	--	--	--
	Papp, Lawrence A.		00557	00004	C.3.1.2	--	--	--
			00557	00005	C.3.1.2	--	--	--
	Pearson, Mark D.		01337	00002	C.2.4.1	--	--	--
			01337	00006	C.3.1.2	--	--	--
			01337	00007	C.3.1.2	--	--	--
	Pehowski, Paula		00412	00001	C.3.4.4	--	--	--
	Peinero, John		01191	00001	C.3.4.4	--	--	--
	Pena, Mayor Frederico	City and County of Denver	02115	00001	C.2.4.1	--	--	--

C.9-12

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Colorado (continued)								
			02115	00002	C.2.4.1	--	--	--
			02115	00003	C.2.4.1	--	--	--
			02115	00004	C.2.4.1	--	--	--
			02115	00005	C.2.4.1	--	--	--
	Petersen, Paul		01201	00001	C.3.4.4	--	--	--
			01201	00002	C.3.1.2	--	--	--
			01201	00003	C.2.4.1	--	--	--
	Pettit, S.		00598	00001	C.3.1.2	--	--	--
	Phillips, Sue		00604	00001	C.3.4.4	--	--	--
	Phillips, Jeff		01188	00001	C.3.1.2	--	--	--
	Pond, Timothy C.		00578	00001A	C.3.1.2	--	--	--
	Robnett, Douglas B.		02071	00001	C.3.4.4	--	--	--
	Rolphe, Timothy M.		01560	00001	C.3.4.4	--	--	--
	Roof, Steven R.		00236	00003	C.3.1.2	--	--	--
	Ruckel, H. Anthony	Sierra Club Legal Defense Fund	01358	00019	C.3.1.2	--	--	--
	Salek, P.		01051	00001	C.3.1.2	--	--	--
	Salk, Joy L.		00560	00001	C.3.1.2	--	--	--
	Shaw, Karyl L.		00605	00001	C.3.4.4	--	--	--
			00605	00003	C.3.1.2	--	--	--
	Shinn, Joyce A.		01300	00001	C.3.4.4	--	--	--
			01300	00002	C.3.4.4	--	--	--
			01300	00003	C.3.4.4	--	--	--
			01300	00004	C.3.4.4	--	--	--
	Slater, Mark		00406	00001	C.3.4.4	--	--	--
			00406	00003	C.3.1.2	--	--	--
	Somrak, Mary Jo & Michael		01379	00002	C.3.1.2	--	--	--
	Spence, Robin E.		01564	00001	C.3.4.4	--	--	--
	Spezia, John W.		00012	00001	C.3.4.4	--	--	--
			00012	00002	C.3.1.2	--	--	--
	Spivak, Paul		00579	00002	C.3.1.2	--	--	--
	Stansberry, Donna		01192	00001	C.3.1.2	--	--	--
	Stokes, Wendy L.		00284	00002	C.2.8.1	--	--	--
	Street, Marianna		01050	00001	C.3.1.2	--	--	--
	Sucherman, Kathy		00147	00001	C.3.4.4	--	--	--
	Sweeney, Chris		01045	00001	C.3.1.2	--	--	--
	Tausehn, Guy		00576	00001	C.3.4.4	--	--	--
			00576	00002	C.3.4.4	--	--	--
	Thomas, Jan		01277	00001	C.3.4.4	--	--	--

C.9-13

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Colorado (continued)</u>								
	Tuchyna, DeeAnn R.		00661	00001	C.3.1.2	--	--	--
	Tyzzler, Andrew		01563	00001	C.3.4.4	--	--	--
	Vanderbeek, Gerard J.		00352	00001	C.3.4.4	--	--	--
			00352	00004	C.2.4.1	--	--	--
	Vick, Ronald E.		00609	00001	C.3.4.4	--	--	--
			00609	00003	C.3.4.4	--	--	--
	Vogler, Harry W.		00420	00001	C.3.4.4	--	--	--
	Vosley, M.		01048	00001	C.3.1.2	--	--	--
	Wackewitz, Frances A.		00282	00001	C.3.4.4	--	--	--
	Walker, Robin		00640	00001	C.3.1.2	--	--	--
	Walker, Jeannette		01220	00001	C.3.1.2	--	--	--
			01220	00002	C.2.2	--	--	--
	Weiner, Kathleen		01087	00001	C.3.4.4	--	--	--
	Welch, Thomas E.		01258	00001	C.3.1.2	--	--	--
			01258	00003	C.3.1.2	--	--	--
	West, David		00630	00001	C.3.1.2	--	--	--
	Wiggans, Tamara		02181	00003	C.2.4.1	--	--	--
			02181	00004	C.2.3.2	--	--	--
	Will, Dale		00458	00001	C.3.4.4	--	--	--
			00458	00003	C.2.8.2	--	--	--
	Worthington, Michael		01105	00001	C.3.4.4	--	--	--
			01105	00002	C.3.4.4	--	--	--
	Wurtz, Tom		02116	00001	C.3.1.2	--	--	--
	Yanz, John & Bonnie		01308	00001	C.3.1.2	--	--	--
			01308	00003	C.3.1.2	--	--	--
	Zinn, Sonya		01106	00001	C.3.1.2	--	--	--
			01106	00003	C.3.1.2	--	--	--
	Zinn, Lennard		01174	00001	C.3.1.2	--	--	--
<u>Connecticut</u>								
	Ceraso/Huang, Jane/William	Yale Env. Litigation Program	00523	00001	C.3.1.2	--	--	--
			00523	00003	C.4.3	--	--	--
			00523	00005	C.8.3	--	--	--
			00523	00006	C.2.2	--	--	--
			00523	00007	C.5.2	--	--	--
			00523	00012	C.2.7	--	--	--
			00523	00014	C.5.7	--	--	--

C.9-1a

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Connecticut (continued)</u>								
			00523	00015	C.7.4	C.7.3	--	--
			00523	00016	C.7.2.2	--	--	--
			00523	00017	C.2.7	--	--	--
			00523	00018	C.2.1.1	--	--	--
	Hughes, Mrs. John Farrel		00069	00001	C.3.4.4	--	--	--
	Shesler, Alysia		00220	00001	C.3.4.4	--	--	--
			00220	00002	C.2.3.2	--	--	--
<u>District of Columbia</u>								
		U.S. Nuclear Reg. Commission	02679	00058	C.3.4.3	--	--	--
			02679	00089	C.2.1.1	--	--	--
	Bedker, Ervin	Department of Air Force	01074	00001	C.6.4	--	--	--
			01074	00002	C.6.4	--	--	--
			01074	00003	C.4.3	--	--	--
			01074	00004	C.6.4	--	--	--
			01074	00005	C.2.4.1	C.6.4	--	--
			01074	00006	C.6.4	--	--	--
			01074	00007	C.6.4	--	--	--
			01074	00008	C.6.4	--	--	--
			01074	00009	C.6.4	--	--	--
			01074	00010	C.6.4	--	--	--
	Bedker, Ervin J.	Department of Air Force	01529	00001	C.6.4	--	--	--
			01529	00002	C.6.4	--	--	--
			01529	00003	C.4.3	--	--	--
			01529	00004	C.6.4	--	--	--
			01529	00005	C.6.4	--	--	--
			01529	00006	C.6.4	--	--	--
			01529	00007	C.6.4	--	--	--
			01529	00008	C.6.4	--	--	--
			01529	00009	C.6.4	--	--	--
			01529	00010	C.6.4	--	--	--
	Bentsen, Senator Lloyd	U.S. Senate Comm. on Environment	01399	00001	C.2.7	--	--	--
			01399	00003	C.2.7	--	--	--
			01399	00006	C.2.3.1	--	--	--
			01399	00008	C.2.1.1	--	--	--
			01399	00009	C.2.7	--	--	--
			01399	00010	C.2.7	--	--	--

C.9-15

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01399	00011	C.3.1.1	--	--	--
			01399	00018	C.3.1.2	--	--	--
			01399	00026	C.2.7	--	--	--
Berick, David		Environmental Policy Institute	01385	00001	C.3.3	--	--	--
			01385	00005	C.2.1.1	--	--	--
			01385	00006	C.3.1.1	--	--	--
			01385	00007	C.2.2	--	--	--
			01385	00008A	C.2.7.1	--	--	--
			01385	00008B	C.2.7.1	--	--	--
			01385	00009A	C.3.1.2	--	--	--
			01385	00009B	C.3.1.1	--	--	--
			01385	00010	C.3.1.2	--	--	--
			01385	00011	C.2.2.1	--	--	--
			01385	00012A	C.2.2.1	--	--	--
			01385	00012B	C.2.7	--	--	--
			01385	00012C	C.3.1.1	--	--	--
			01385	00012D	C.3.1.1	--	--	--
			01385	00012E	C.3.1.2	--	--	--
			01385	00012F	C.2.7	--	--	--
			01385	00013	C.3.3	--	--	--
			01385	00014	C.3.3	--	--	--
			01385	00015	C.3.3	--	--	--
			01385	00016A	C.2.7	--	--	--
			01385	00016B	C.2.4.1	--	--	--
			01385	00016C	C.2.4.1	--	--	--
			01385	00016D	C.2.4.1	--	--	--
			01385	00017	C.2.6.1	--	--	--
			01385	00018	C.3.4.3	7.3	--	--
			01385	00019	C.2.4.1	--	--	--
			01385	00020	C.2.4.1	--	--	--
			01385	00021	C.3.4.2.2	C.3.4.3	--	--
			01385	00022A	C.2.6.1	--	--	--
			01385	00022B	C.2.4.1	--	--	--
			01385	00023A	C.2.5.1	--	--	--
			01385	00023B	C.2.4.1	--	--	--
			01385	00024	C.2.4.1	--	--	--
			01385	00025	C.2.4.1	--	--	--
Berick, David		Environmental Policy Institute	01387	00001	C.2.1.1	--	--	--

C.9-16

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			01387	00005	C.2.1.1	--	--	--
			01387	00006	C.3.1.1	--	--	--
			01387	00007	C.2.2	--	--	--
			01387	00008A	C.2.7.1	--	--	--
			01387	00008B	C.2.7.1	--	--	--
			01387	00009	C.2.2.1	--	--	--
			01387	00010	C.3.1.2	--	--	--
			01387	00011	C.2.2.1	--	--	--
			01387	00012A	C.2.2.1	--	--	--
			01387	00012B	C.2.2.1	--	--	--
			01387	00012C	C.3.1.1	--	--	--
			01387	00012D	C.3.1.1	--	--	--
			01387	00012E	C.3.3	--	--	--
			01387	00012F	C.2.2.1	--	--	--
			01387	00013	C.3.3	--	--	--
			01387	00014	C.3.3	--	--	--
			01387	00015	C.3.3	--	--	--
			01387	00016A	C.2.7	--	--	--
			01387	00016B	C.2.4.1	--	--	--
			01387	00016C	C.2.4.1	--	--	--
			01387	00016D	C.2.4.1	--	--	--
			01387	00017	C.2.6.1	--	--	--
			01387	00018	C.3.4.3	C.7.3	--	--
			01387	00019	C.2.4.1	--	--	--
			01387	00020	C.2.4.1	--	--	--
			01387	00021	C.2.4.1	C.3.4.3	--	--
			01387	00022A	C.2.6.1	--	--	--
			01387	00022B	C.2.4.1	--	--	--
			01387	00023A	C.2.4.1	--	--	--
			01387	00023B	C.2.4.1	--	--	--
			01387	00024	C.2.4.1	--	--	--
			01387	00025	C.2.4.1	--	--	--
	Berick, David	Environmental Policy Institute	01388	00001	C.3.3	--	--	--
			01388	00002	C.2.1.1	--	--	--
			01388	00005	C.2.1.1	--	--	--
			01388	00006	C.3.1.1	--	--	--
			01388	00007	C.2.2	--	--	--
			01388	00008A	C.2.7.1	--	--	--

C.9-17

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			01388	00008B	C.2.7.1	--	--	--
			01388	00009	C.2.2.1	--	--	--
			01388	00010	C.3.1.2	--	--	--
			01388	00011	C.2.2.1	--	--	--
			01388	00012A	C.2.2.1	--	--	--
			01388	00012B	C.2.2.1	--	--	--
			01388	00012C	C.3.1.1	--	--	--
			01388	00012D	C.3.1.1	--	--	--
			01388	00012E	C.3.3	--	--	--
			01388	00012F	C.2.2.1	--	--	--
			01388	00013	C.3.3	--	--	--
			01388	00014	C.3.3	--	--	--
			01388	00015	C.3.3	--	--	--
			01388	00016A	C.2.7	--	--	--
			01388	00016B	C.2.4.1	--	--	--
			01388	00016C	C.2.4.1	--	--	--
			01388	00016D	C.2.4.1	--	--	--
			01388	00017	C.2.6.1	--	--	--
			01388	00018	C.3.4.3	C.7.3	--	--
			01388	00019	C.2.4.1	--	--	--
			01388	00020	C.2.4.1	--	--	--
			01388	00021	C.2.4.1	C.3.4.3	--	--
			01388	00022A	C.2.6.1	--	--	--
			01388	00022B	C.2.4.1	--	--	--
			01388	00023A	C.2.5.1	--	--	--
			01388	00023B	C.2.4.1	--	--	--
			01388	00024	C.2.4.1	--	--	--
			01388	00025	C.2.4.1	--	--	--
Berick, David		Environmental Policy Institute	01389	00001	C.3.3	--	--	--
			01389	00002	C.2.1.1	--	--	--
			01389	00005	C.2.1.1	--	--	--
			01389	00006	C.3.1.1	--	--	--
			01389	00007	C.2.2	--	--	--
			01389	00008A	C.2.7.1	--	--	--
			01389	00008B	C.2.7.1	--	--	--
			01389	00009	C.2.2.1	--	--	--
			01389	00010	C.3.1.2	--	--	--
			01389	00011	C.2.2.1	--	--	--

C.9-18

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
District of Columbia (continued)								
			01389	00012A	C.2.2.1	--	--	--
			01389	00012B	C.2.2.1	--	--	--
			01389	00012C	C.3.1.1	--	--	--
			01389	00012D	C.3.1.1	--	--	--
			01389	00012E	C.3.3	--	--	--
			01389	00012F	C.2.2.1	--	--	--
			01389	00013	C.3.3	--	--	--
			01389	00014	C.3.3	--	--	--
			01389	00015	C.3.3	--	--	--
			01389	00016A	C.2.7	--	--	--
			01389	00016B	C.2.4.1	--	--	--
			01389	00016C	C.2.4.1	--	--	--
			01389	00016D	C.2.4.1	--	--	--
			01389	00017	C.2.6.1	--	--	--
			01389	00018	C.3.4.3	C.7.3	--	--
			01389	00019	C.2.4.1	--	--	--
			01389	00020	C.2.4.1	--	--	--
			01389	00021	C.2.4.1	C.3.4.3	--	--
			01389	00022A	C.2.6.1	--	--	--
			01389	00022B	C.2.4.1	--	--	--
			01389	00023A	C.2.5.1	--	--	--
			01389	00023B	C.2.4.1	--	--	--
			01389	00024	C.2.4.1	--	--	--
			01389	00025	C.2.4.1	--	--	--
	Berick, David	Environmental Policy Institute	01386	00001	C.2.1.1	--	--	--
			01386	00005	C.2.1.1	--	--	--
			01386	00006	C.3.1.1	--	--	--
			01386	00007	C.2.2	--	--	--
			01386	00008A	C.2.7.1	--	--	--
			01386	00008B	C.2.7.1	--	--	--
			01386	00009	C.2.2.1	--	--	--
			01386	00010	C.3.1.2	--	--	--
			01386	00011	C.2.2.1	--	--	--
			01386	00012A	C.2.2.1	--	--	--
			01386	00012B	C.2.2.1	--	--	--
			01386	00012C	C.3.1.1	--	--	--
			01386	00012D	C.3.1.1	--	--	--
			01386	00012E	C.3.3	--	--	--

C.9-19

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01386	00012F	C.2.2.1	--	--	--
			01386	00013	C.3.3	--	--	--
			01386	00014	C.3.3	--	--	--
			01386	00015	C.3.3	--	--	--
			01386	00016A	C.2.7	--	--	--
			01386	00016B	C.2.4.1	--	--	--
			01386	00016C	C.2.4.1	--	--	--
			01386	00016D	C.2.4.1	--	--	--
			01386	00017	C.2.6.1	--	--	--
			01386	00018	C.3.4.3	--	--	--
			01386	00019	C.2.4.1	--	--	--
			01386	00020	C.2.4.1	--	--	--
			01386	00021	C.2.4.1	C.3.4.3	--	--
			01386	00022A	C.2.6.1	--	--	--
			01386	00022B	C.2.4.1	--	--	--
			01386	00023A	C.2.5.1	--	--	--
			01386	00023B	C.2.4.1	--	--	--
			01386	00024	C.2.4.1	--	--	--
			01386	00025	C.2.4.1	--	--	--
Blakey, L. H.		Department of Army, Plan. Div.	02065	00026	C.2.7	--	--	--
			02065	00027	C.3.1.1	--	--	--
			02065	00028	C.3.1.1	--	--	--
			02065	00033	C.3.1.2	--	--	--
			02065	00034	C.3.3	--	--	--
			02065	00045	C.3.1.1	--	--	--
			02065	00066A	C.3.1.1	--	--	--
			02065	00077	C.3.1.1	--	C.8.2	--
			02069	00001	C.4.1.2.1	--	--	--
			02069	00002	C.4.1.3.2	--	--	--
			02069	00003	C.4.1.3.2	--	--	--
Blanchard, Bruce		U.S. Dept. of Interior	02123	00001	C.2.7	--	--	--
			02123	00002	C.2.1.1	--	--	--
			02123	00004	C.2.3.3	--	--	--
			02123	00005	C.3.4.4	--	--	--
			02123	00006	C.3.4.4	--	--	--
			02123	00007	C.3.4.3	--	--	--
			02123	00008	C.3.4.3	--	--	--
			02123	00009	C.3.4.3	--	--	--

C.9-20

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			02123	00010	C.3.4.1	--	--	--
			02123	00011	C.3.4.1	--	--	--
			02123	00012	C.3.4.1	--	--	--
			02123	00013	C.3.4.3	--	--	--
			02123	00014	C.3.4.1	--	--	--
			02123	00015	C.3.4.1	--	--	--
			02123	00016	C.3.4.3	--	--	--
			02123	00017	C.3.4.1	--	--	--
			02123	00018	C.3.4.1	--	--	--
			02123	00019	C.3.4.1	--	--	--
			02123	00020	C.3.4.1	--	--	--
			02123	00021	C.3.4.1	--	--	--
			02123	00022	C.3.4.3	--	--	--
			02123	00023	C.3.4.1	--	--	--
			02123	00024	C.3.4.1	--	--	--
			02123	00025	C.3.4.1	--	--	--
			02123	00026	C.3.4.1	--	--	--
			02123	00027	C.3.4.1	--	--	--
			02123	00028	C.3.4.1	--	--	--
			02123	00029	C.3.4.1	--	--	--
			02123	00030	C.3.4.1	--	--	--
			02123	00031	C.3.4.1	--	--	--
			02123	00032	C.3.4.1	--	--	--
			02123	00033	C.3.4.1	--	--	--
			02123	00034	C.3.4.2.1	--	--	--
			02123	00035	C.3.4.2.1	--	--	--
			02123	00036	C.3.4.2	--	--	--
			02123	00037	C.3.4.2.3	--	--	--
			02123	00039	C.2.7	--	--	--
			02123	00040	C.2.7	--	--	--
			02123	00041	C.2.7	--	--	--
			02123	00047A	C.2.4.1	--	--	--
			02123	00047B	C.3.1.2	--	--	--
			02123	00067	C.6.1	--	--	--
			02123	00068	C.3.3	--	--	--
Blanchard, Bruce		U.S. Dept. of Interior	01598	00001	C.2.7	--	--	--
			01598	00004	C.2.3.3	--	--	--
			01598	00005	C.3.4.4	--	--	--

C.9-21

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			01598	00006	C.3.4.4	--	--	--
			01598	00007	C.3.4.3	--	--	--
			01598	00008	C.3.4.3	--	--	--
			01598	00009	C.3.4.3	--	--	--
			01598	00010	C.3.4.1	--	--	--
			01598	00011	C.3.4.1	--	--	--
			01598	00012	C.3.4.1	--	--	--
			01598	00013	C.3.4.3	--	--	--
			01598	00014	C.3.4.1	--	--	--
			01598	00015	C.3.4.1	--	--	--
			01598	00016	C.3.4.3	--	--	--
			01598	00017	C.3.4.1	--	--	--
			01598	00018	C.3.4.1	--	--	--
			01598	00019	C.3.4.1	--	--	--
			01598	00020	C.3.4.1	--	--	--
			01598	00021	C.3.4.1	--	--	--
			01598	00022	C.3.4.3	--	--	--
			01598	00023	C.3.4.1	--	--	--
			01598	00024	C.3.4.1	--	--	--
			01598	00025	C.3.4.1	--	--	--
			01598	00026	C.3.4.1	--	--	--
			01598	00027	C.3.4.1	--	--	--
			01598	00028	C.3.4.1	--	--	--
			01598	00029	C.3.4.1	--	--	--
			01598	00030	C.3.4.1	--	--	--
			01598	00031	C.3.4.1	--	--	--
			01598	00032	C.3.4.1	--	--	--
			01598	00033	C.3.4.1	--	--	--
			01598	00034	C.3.4.2.1	--	--	--
			01598	00035	C.3.4.2.1	--	--	--
			01598	00036	C.3.4.2	--	--	--
			01598	00037	C.3.4.2.3	--	--	--
			01598	00039	C.2.7	--	--	--
			01598	00040	C.2.7	--	--	--
			01598	00041	C.2.7	--	--	--
			01598	00043	C.4.1.4	--	--	--
			01598	00045	C.3.4.2.2	--	--	--
			01598	00046	C.3.4.1	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01598	00047A	C.3.4.1	--	--	--
			01598	00047B	C.3.4.1	--	--	--
			01598	00047C	C.3.4.1	--	--	--
			01598	00048	C.3.4.1	--	--	--
			01598	00049	C.3.4.3	--	--	--
			01598	00053	C.3.4.3	--	--	--
			01598	00055C	C.3.4.3	--	--	--
			01598	00056	C.3.4.3	--	--	--
			01598	00057	C.2.7	--	--	--
			01598	00058	C.3.1.2	--	--	--
			01598	00059	C.2.7	--	--	--
			01598	00060	C.2.7	--	--	--
			01598	00199	C.3.4.3	--	--	--
			01598	00200	C.2.8.3	--	--	--
			01598	00217	C.2.7	--	--	--
			01598	00245	C.3.4.4	--	--	--
			01598	00246	C.3.4.1	--	--	--
			01598	00247	C.3.4.1	--	--	--
			01598	00248	C.3.4.1	--	--	--
			01598	00249	C.3.4.1	--	--	--
			01598	00250	C.3.4.1	--	--	--
			01598	00251	C.3.4.2.2	--	--	--
			01598	00252	C.2.4.1	--	--	--
			01598	00253	C.2.7	--	--	--
			01598	00254	C.2.7	--	--	--
			01598	00255	C.2.7	--	--	--
			01598	00256	C.2.7	--	--	--
			01598	00257	C.2.7	--	--	--
			01598	00258	C.2.7	--	--	--
			01598	00259	C.2.7	--	--	--
			01598	00260	C.2.7	--	--	--
			01598	00261	C.2.7	--	--	--
			01598	00262	C.2.7	--	--	--
			01598	00263	C.2.7	--	--	--
			01598	00264	C.2.7	--	--	--
			01598	00321	C.3.4.3	--	--	--

C.9-23

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01598	00326	C.3.1.2	--	--	--
			01598	00327	C.2.2	--	--	--
			01598	00328A	C.3.4.1	--	--	--
			01598	00335	C.3.3.1	--	--	--
Blanchard, Bruce		U.S. Dept. of Interior	02122	00001	C.2.7.4	--	--	--
			02122	00002	C.2.1.1	--	--	--
			02122	00004	C.2.3.3	--	--	--
			02122	00005	C.3.4.4	--	--	--
			02122	00006	C.3.4.4	--	--	--
			02122	00007	C.3.4.3	--	--	--
			02122	00008	C.3.4.3	--	--	--
			02122	00009	C.3.4.3	--	--	--
			02122	00010	C.3.4.1	--	--	--
			02122	00011	C.3.4.1	--	--	--
			02122	00012	C.3.4.1	--	--	--
			02122	00013	C.3.4.3	--	--	--
			02122	00014	C.3.4.1	--	--	--
			02122	00015	C.3.4.1	--	--	--
			02122	00016	C.3.4.3	--	--	--
			02122	00017	C.3.4.1	--	--	--
			02122	00018	C.3.4.1	--	--	--
			02122	00019	C.3.4.1	--	--	--
			02122	00020	C.3.4.1	--	--	--
			02122	00021	C.3.4.1	--	--	--
			02122	00022	C.3.4.3	--	--	--
			02122	00023	C.3.4.1	--	--	--
			02122	00024	C.3.4.1	--	--	--
			02122	00025	C.3.4.1	--	--	--
			02122	00026	C.3.4.1	--	--	--
			02122	00027	C.3.4.1	--	--	--
			02122	00028	C.3.4.1	--	--	--
			02122	00029	C.3.4.1	--	--	--
			02122	00030	C.3.4.1	--	--	--
			02122	00031	C.3.4.1	--	--	--
			02122	00032	C.3.4.1	--	--	--
			02122	00033	C.3.4.1	--	--	--
			02122	00034	C.3.4.2.1	--	--	--
			02122	00035	C.3.4.2.1	--	--	--

C.9-24

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			02122	00036	C.3.4.2	--	--	--
			02122	00037	C.3.4.2.3	--	--	--
			02122	00039	C.2.7	--	--	--
			02122	00040	C.2.7	--	--	--
			02122	00041	C.2.7	--	--	--
			02122	00046	C.2.7	--	--	--
			02122	00047	C.2.7	--	--	--
Blanchard, Bruce		U.S. Dept. of Interior	01565	00001	C.2.7.4	--	--	--
			01565	00002	C.2.1.1	--	--	--
			01565	00003	C.5.1	--	--	--
			01565	00004	C.2.3.3	--	--	--
			01565	00005	C.3.4.4	--	--	--
			01565	00006	C.3.4.4	--	--	--
			01565	00007	C.3.4.3	--	--	--
			01565	00008	C.3.4.3	--	--	--
			01565	00009	C.3.4.3	--	--	--
			01565	00010	C.3.4.1	--	--	--
			01565	00011	C.3.4.1	--	--	--
			01565	00012	C.3.4.1	--	--	--
			01565	00013	C.3.4.3	--	--	--
			01565	00014	C.3.4.1	--	--	--
			01565	00015	C.3.4.1	--	--	--
			01565	00016	C.3.4.3	--	--	--
			01565	00017	C.3.4.1	--	--	--
			01565	00018	C.3.4.1	--	--	--
			01565	00019	C.3.4.1	--	--	--
			01565	00020	C.3.4.1	--	--	--
			01565	00021	C.3.4.1	--	--	--
			01565	00022	C.3.4.3	--	--	--
			01565	00023	C.3.4.1	--	--	--
			01565	00024	C.3.4.1	--	--	--
			01565	00025	C.3.4.1	--	--	--
			01565	00026	C.3.4.1	--	--	--
			01565	00027	C.3.4.1	--	--	--
			01565	00028	C.3.4.1	--	--	--
			01565	00029	C.3.4.1	--	--	--
			01565	00030	C.3.4.1	--	--	--
			01565	00031	C.3.4.1	--	--	--

C.9-25

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			01565	00032	C.3.4.1	--	--	--
			01565	00033	C.3.4.1	--	--	--
			01565	00034	C.3.4.2	--	--	--
			01565	00035	C.3.4.2.1	--	--	--
			01565	00036	C.3.4.2	--	--	--
			01565	00037	C.3.4.2.3	--	--	--
			01565	00039	C.2.7	--	--	--
			01565	00040	C.2.7	--	--	--
			01565	00041	C.2.7	--	--	--
			01565	00042A	C.5.8	--	--	--
			01565	00042B	C.5.1	--	--	--
			01565	00043	C.2.7	--	--	--
			01565	00044	C.3.1.3	--	--	--
			01565	00045	C.3.1.3	--	--	--
			01565	00046	C.3.1.3	--	--	--
			01565	00047	C.4.1.2.2	--	--	--
			01565	00048	C.3.1.3	--	--	--
			01565	00049	C.3.1.3	--	--	--
			01565	00050	C.3.1.3	--	--	--
			01565	00051	C.4.1.1	--	--	--
			01565	00052	C.4.1.1	--	--	--
			01565	00053	C.4.1.1	--	--	--
			01565	00054	C.5.1	--	--	--
			01565	00055	C.4.1.1	--	--	--
			01565	00056	C.4.1.3.3	--	--	--
			01565	00057	C.4.1.2.1	--	--	--
			01565	00058	C.4.1.2.2	--	--	--
			01565	00059	C.4.1.2.2	--	--	--
			01565	00060	C.4.1.2.2	--	--	--
			01565	00061	C.4.1.2.3	--	--	--
			01565	00062	C.4.1.3.2	--	--	--
			01565	00063	C.4.1.3.5	--	--	--
			01565	00064	C.4.1.3.6	--	--	--
			01565	00065	C.4.1.3.6	--	--	--
			01565	00066	C.4.1.3.6	--	--	--
			01565	00067	C.4.1.3.6	--	--	--
			01565	00068	C.4.1.3.6	--	--	--
			01565	00069	C.4.1.3.6	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01565	00070	C.4.1.3.6	--	--	--
			01565	00071	C.7.3	--	--	--
			01565	00072	C.4.1.4	--	--	--
			01565	00073	C.4.2.2	--	--	--
			01565	00074	C.7.1.1	--	--	--
			01565	00075	C.7.1.1	--	--	--
			01565	00076	C.7.1.1	--	--	--
			01565	00077	C.7.2.6	--	--	--
			01565	00078	C.7.2.6	--	--	--
			01565	00079	C.7.2	--	--	--
			01565	00080	C.7.4.3	--	--	--
			01565	00081	C.7.2	--	--	--
			01565	00082	C.7.2	--	--	--
			01565	00083	C.5.1	--	--	--
			01565	00084	C.5.1	--	--	--
			01565	00085	C.5.1	--	--	--
			01565	00086	C.5.1	--	--	--
			01565	00087	C.5.8	--	--	--
			01565	00088	C.5.1	--	--	--
			01565	00089	C.5.1	--	--	--
			01565	00090	C.5.2	--	--	--
			01565	00091	C.5.3	--	--	--
			01565	00092	C.5.3	--	--	--
			01565	00093	C.5.3	--	--	--
			01565	00094	C.5.3	--	--	--
			01565	00095	C.5.4	--	--	--
			01565	00096	C.5.4	--	--	--
			01565	00097	C.5.4	--	--	--
			01565	00098	C.5.4	--	--	--
			01565	00099	C.5.4	--	--	--
			01565	00100	C.5.5	--	--	--
			01565	00101	C.5.7	--	--	--
			01565	00102	C.5.7	--	--	--
			01565	00103	C.5.7	--	--	--
			01565	00104	C.5.7	--	--	--
			01565	00105	C.5.7	--	--	--
			01565	00106	C.5.7	--	--	--

C:9-27

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			01565	00107	C.5.7	--	--	--
			01565	00108	C.5.8	--	--	--
			01565	00109	C.5.8	--	--	--
			01565	00110	C.5.8	--	--	--
			01565	00111	C.5.8	--	--	--
			01565	00112	C.8.1	--	--	--
			01565	00113	C.8.4	--	--	--
			01565	00114	C.8.4	--	--	--
			01565	00115	C.8.4	--	--	--
			01565	00116	C.8.4	--	--	--
Blanchard, Bruce		U.S. Dept. of Interior	01599	00001	C.2.7	--	--	--
			01599	00002	C.2.1.1	--	--	--
			01599	00004	C.2.3.3	--	--	--
			01599	00005	C.3.4.4	--	--	--
			01599	00006	C.3.4.1	--	--	--
			01599	00007	C.3.4.1	--	--	--
			01599	00008	C.3.4.3	--	--	--
			01599	00009	C.3.4	--	--	--
			01599	00010	C.3.4.1	--	--	--
			01599	00011	C.3.4.1	--	--	--
			01599	00012	C.3.4.1	--	--	--
			01599	00013	C.3.4	--	--	--
			01599	00014	C.3.4.1	--	--	--
			01599	00015	C.3.4.1	--	--	--
			01599	00016	C.3.4.1	--	--	--
			01599	00017	C.3.4.1	--	--	--
			01599	00018	C.3.4.1	--	--	--
			01599	00019	C.3.4.1	--	--	--
			01599	00020	C.3.4.1	--	--	--
			01599	00021	C.3.4.1	--	--	--
			01599	00022	C.3.4.3	--	--	--
			01599	00023	C.3.4.1	--	--	--
			01599	00024	C.3.4.1	--	--	--
			01599	00025	C.3.4.1	--	--	--
			01599	00026	C.3.4.1	--	--	--
			01599	00027	C.3.4.1	--	--	--
			01599	00028	C.3.4.1	--	--	--
			01599	00029	C.3.4.1	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01599	00030	C.3.4.1	--	--	--
			01599	00031	C.3.4.1	--	--	--
			01599	00032	C.3.4.1	--	--	--
			01599	00033	C.3.4.1	--	--	--
			01599	00034	C.3.4.2.1	--	--	--
			01599	00035	C.3.4.2.1	--	--	--
			01599	00036	C.3.4.2	--	--	--
			01599	00037	C.3.4.2.3	--	--	--
			01599	00039	C.2.7	--	--	--
			01599	00040	C.2.7	--	--	--
			01599	00041	C.2.7	--	--	--
			01599	00047B	C.3.4.1	--	--	--
			01599	00047C	C.3.4.1	--	--	--
			01599	00048	C.3.4.1	--	--	--
			01599	00050A	C.4.1.2.1	C.3.4.1	--	--
			01599	00062	C.3.1.1	--	--	--
			01599	00066	C.4.1.4	C.7.3	--	--
			01599	00068	C.3.1.1	--	--	--
			01599	00069	C.3.4.1	--	--	--
			01599	00070A	C.3.4.1	--	--	--
			01599	00070B	C.3.4.1	--	--	--
			01599	00070C	C.3.4.1	--	--	--
			01599	00071	C.3.4.1	--	--	--
			01599	00072	C.3.4.2.1	--	--	--
			01599	00076	C.3.4.3	--	--	--
			01599	00078	C.3.4.3	--	--	--
			01599	00078C	C.3.4.3	--	--	--
			01599	00079	C.3.4.3	--	--	--
			01599	00081	C.2.7	--	--	--
			01599	00082	C.2.7	--	--	--
			01599	00083	C.2.7	--	--	--
			01599	00208	C.3.1.1	--	--	--
			01599	00209	C.2.8.3	--	--	--
			01599	00216	C.2.7	--	--	--
			01599	00217	C.2.7	--	--	--
			01599	00226	C.2.7	--	--	--

C.9-29

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01599	00246	C.3.4.1	--	--	--
			01599	00247	C.3.4.1	--	--	--
			01599	00248	C.3.4.1	--	--	--
			01599	00249	C.3.4.1	--	--	--
			01599	00250	C.3.4.1	--	--	--
			01599	00251	C.3.4.2.2	--	--	--
			01599	00252	C.2.4.1	--	--	--
			01599	00252B	C.3.4.2.2	--	--	--
			01599	00264	C.2.7	--	--	--
Blanchard, Bruce		U.S. Dept. of Interior	01566	00002	C.2.1.1	--	--	--
			01566	00003	C.2.7	--	--	--
			01566	00004	C.2.3.3	--	--	--
			01566	00005	C.3.4.4	--	--	--
			01566	00006	C.3.4.1	--	--	--
			01566	00007	C.3.4.3	--	--	--
			01566	00008	C.3.4.3	--	--	--
			01566	00009	C.3.4	--	--	--
			01566	00010	C.3.4.1	--	--	--
			01566	00011	C.3.4.1	--	--	--
			01566	00012	C.3.4.1	--	--	--
			01566	00013	C.3.4	--	--	--
			01566	00014	C.3.4.1	--	--	--
			01566	00015	C.3.4.1	--	--	--
			01566	00016	C.3.4.1	--	--	--
			01566	00017	C.3.4.1	--	--	--
			01566	00018	C.3.4.1	--	--	--
			01566	00019	C.3.4.1	--	--	--
			01566	00020	C.3.4.1	--	--	--
			01566	00021	C.3.4.1	--	--	--
			01566	00022	C.3.4.3	--	--	--
			01566	00023	C.3.4.1	--	--	--
			01566	00024	C.3.4.1	--	--	--
			01566	00025	C.3.4.1	--	--	--
			01566	00026	C.3.4.1	--	--	--
			01566	00027	C.3.4.1	--	--	--
			01566	00028	C.3.4.1	--	--	--
			01566	00029	C.3.4.1	--	--	--
			01566	00030	C.3.4.1	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			01566	00031	C.3.4.1	--	--	--
			01566	00032	C.3.4.1	--	--	--
			01566	00033	C.3.4.1	--	--	--
			01566	00034	C.3.4.2.1	--	--	--
			01566	00035	C.3.4.2.1	--	--	--
			01566	00036	C.3.4.2.3	--	--	--
			01566	00037	C.2.3.2	--	--	--
			01566	00038	C.2.7	--	--	--
			01566	00039	C.2.7	--	--	--
			01566	00040	C.2.7	--	--	--
			01566	00123	C.3.4	--	--	--
			01566	00124	C.3.4	--	--	--
			01566	00125	C.3.4	--	--	--
			01566	00126	C.3.4	--	--	--
			01566	00127	C.3.4	--	--	--
			01566	00128	C.3.4	--	--	--
			01566	00129	C.3.4	--	--	--
			01566	00130	C.3.4	--	--	--
			01566	00131	C.3.4	--	--	--
			01566	00132	C.3.4	--	--	--
			01566	00133	C.3.4	--	--	--
			01566	00134	C.3.4	--	--	--
	Blanchard, Bruce	U.S. Dept. of Interior	01567	00001	C.2.7	--	--	--
			01567	00002	C.2.1.1	--	--	--
			01567	00004	C.2.3.3	--	--	--
			01567	00005	C.3.4.4	--	--	--
			01567	00006	C.3.4.4	--	--	--
			01567	00007	C.3.4.3	--	--	--
			01567	00008	C.3.4.3	--	--	--
			01567	00009	C.3.4.3	--	--	--
			01567	00010	C.3.4.1	--	--	--
			01567	00011	C.3.4.1	--	--	--
			01567	00012	C.3.4.1	--	--	--
			01567	00013	C.3.4.3	--	--	--
			01567	00014	C.3.4.1	--	--	--
			01567	00015	C.3.4.1	--	--	--
			01567	00016	C.3.4.3	--	--	--
			01567	00017	C.3.4.1	--	--	--

C.9-31

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01567	00018	C.3.4.1	--	--	--
			01567	00019	C.3.4.1	--	--	--
			01567	00020	C.3.4.1	--	--	--
			01567	00021	C.3.4.1	--	--	--
			01567	00022	C.3.4.3	--	--	--
			01567	00023	C.3.4.1	--	--	--
			01567	00024	C.3.4.1	--	--	--
			01567	00025	C.3.4.1	--	--	--
			01567	00026	C.3.4.1	--	--	--
			01567	00027	C.3.4.1	--	--	--
			01567	00028	C.3.4.1	--	--	--
			01567	00029	C.3.4.1	--	--	--
			01567	00030	C.3.4.1	--	--	--
			01567	00031	C.3.4.1	--	--	--
			01567	00032	C.3.4.1	--	--	--
			01567	00033	C.3.4.1	--	--	--
			01567	00034	C.3.4.2.1	--	--	--
			01567	00035	C.3.4.2.1	--	--	--
			01567	00036	C.3.4.4	--	--	--
			01567	00037	C.2.3.2	--	--	--
			01567	00038	C.2.7	--	--	--
			01567	00039	C.2.7	--	--	--
			01567	00040	C.2.7	--	--	--
Buren, Mindy A.		LeBoeuf, Lamb, Leiby, & MacRae	02252	00001	C.2.4.1	--	--	--
			02252	00002	C.2.4.1	--	--	--
			02252	00003	C.2.4.1	--	--	--
			02252	00004	C.2.4.1	--	--	--
			02252	00005	C.2.4.1	--	--	--
			02252	00006	C.2.4.1	--	--	--
			02252	00007	C.2.4.1	--	--	--
			02252	00008	C.2.4.1	--	--	--
			02252	00009	C.2.4.1	--	--	--
			02252	00010	C.2.4.1	--	--	--
			02252	00011	C.2.4.1	--	--	--
			02252	00012	C.2.4.1	--	--	--
			02252	00013	C.2.4.1	--	--	--
			02252	00014	C.2.4.1	--	--	--
			02252	00015	C.2.4.1	--	--	--

C.9-32

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			02252	00016	C.2.4.1	--	--	--
			02252	00017	C.2.4.1	--	--	--
			02252	00018	C.2.4.1	--	--	--
			02252	00019	C.2.4.1	--	--	--
			02252	00020	C.2.4.1	--	--	--
			02252	00021	C.2.4.1	--	--	--
			02252	00022	C.2.4.1	--	--	--
			02252	00023	C.2.4.1	--	--	--
			02252	00024	C.2.4.1	--	--	--
			02252	00025	C.2.4.1	--	--	--
			02252	00026	C.2.4.1	--	--	--
			02252	00027	C.2.4.1	--	--	--
			02252	00028	C.2.4.1	--	--	--
			02252	00029	C.2.4.1	--	--	--
			02252	00030	C.2.4.1	--	--	--
			02252	00031	C.2.4.1	--	--	--
			02252	00032	C.2.4.1	--	--	--
			02252	00033	C.2.4.1	--	--	--
			02252	00034	C.2.4.1	--	--	--
			02252	00035	C.2.4.1	--	--	--
			02252	00036	C.2.4.1	--	--	--
			02252	00037	C.2.4.1	--	--	--
			02252	00038	C.2.4.1	--	--	--
			02252	00039	C.2.4.1	--	--	--
			02252	00040	C.2.4.1	--	--	--
			02252	00041	C.2.4.1	--	--	--
			02252	00042	C.2.4.1	--	--	--
			02252	00043	C.2.4.1	--	--	--
			02252	00044	C.2.4.1	--	--	--
			02252	00045	C.2.4.1	--	--	--
			02252	00046	C.2.4.1	--	--	--
			02252	00047	C.2.4.1	--	--	--
			02252	00048	C.2.4.1	--	--	--
			02252	00049	C.2.4.1	--	--	--
Davis, John G.		U.S. Nuclear Reg. Commission	01037	00008	C.3.4.2.3	--	--	--
			01037	00137	C.3.4.3	--	--	--
			01037	00139	C.7.3	--	--	--
			01038	00009	C.3.4.2.3	--	--	--

C.9-33

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION				
					FIRST	SECOND	THIRD	FOURTH	
<u>District of Columbia (continued)</u>									
			01038	00010	C.3.4.3	--	--	--	
			01038	00015	C.2.7	--	--	--	
			01038	00017	C.2.7	--	--	--	
			01038	00018	C.2.7	--	--	--	
			01038	00084	C.2.4.1	--	--	--	
			01038	00085	C.2.4.1	--	--	--	
			01038	00087	C.2.1.2	C.7.4	--	--	
			01039	00011	C.3.4.2.3	--	--	--	
			01039	00012	C.3.4.3	--	--	--	
			01039	00015	C.7.3	--	--	--	
			01039	00199	C.3.4.1	--	--	--	
			01039	00200	C.2.7	--	--	--	
	Davis, John G.	U.S. Nuclear Reg. Commission	01040	00005	C.5.3	C.8.2	--	--	
			01040	00010	C.3.4.2.3	--	--	--	
			01040	00011	C.3.4.3	--	--	--	
			01040	00014	C.7.3	--	--	--	
			01040	00168	C.3.4.1	--	--	--	
			01040	00169	C.3.4.1	--	--	--	
			01040	00170	C.3.4.1	--	--	--	
	Davis, John G.	U.S. Nuclear Reg. Commission	01041	00013	C.3.1.3	C.3.4.2.3	--	--	
			01041	00014	C.3.4.3	--	--	--	
			01041	00015	C.3.1.2	--	--	--	
			01041	00018	C.7.3	--	--	--	
			01041	00214	C.3.4.1	--	--	--	
			01041	00215	C.3.4.1	--	--	--	
	Davis, John G.	U.S. Nuclear Reg. Commission	01042	00001	C.5.7	--	--	--	
			01042	00002	C.5.7	--	--	--	
			01042	00003	C.5.1	--	--	--	
			01042	00004	C.5.1	--	--	--	
			01042	00005	C.5.2	--	--	--	
			01042	00006	C.5.2	--	--	--	
			01042	00007	C.5.2	--	--	--	
			01042	00008	C.5.4	--	--	--	
			01042	00009	C.8.3	C.3.4.2.3	--	--	
			01042	00010	C.5.10	--	--	--	
			01042	00011	C.3.4.3	--	--	--	
			01042	00012	C.3.1	C.2.7	--	--	
			01042	00013	C.2.4.1	--	--	--	

C.9-34

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			01042	00014	C.3.1	C.2.7	--	--
			01042	00015	C.4.1.3.1	C.2.7	--	--
			01042	00016	C.4.1.3.1	--	--	--
			01042	00017	C.4.1.1	--	--	--
			01042	00018	C.5.1	--	--	--
			01042	00019	C.4.1.1	--	--	--
			01042	00020	C.4.1.1	--	--	--
			01042	00021	C.4.1.1	--	--	--
			01042	00022	C.4.1.1	--	--	--
			01042	00023	C.4.1.1	--	--	--
			01042	00024	C.4.1.1	--	--	--
			01042	00025	C.4.1.1	--	--	--
			01042	00026	C.4.1.1	--	--	--
			01042	00027	C.4.1.1	--	--	--
			01042	00028	C.4.1.1	--	--	--
			01042	00029	C.4.1.2.2	--	--	--
			01042	00030	C.4.1.2.2	--	--	--
			01042	00031	C.4.1.2.3	--	--	--
			01042	00032	C.4.1.3.3	--	--	--
			01042	00033	C.4.1.3.3	--	--	--
			01042	00034	C.4.1.5.3	--	--	--
			01042	00035	C.7.1.1	--	--	--
			01042	00036	C.7.1.1	--	--	--
			01042	00037	C.4.2.2	--	--	--
			01042	00038	C.4.2.2	--	--	--
			01042	00039	C.4.2.2	--	--	--
			01042	00040	C.4.2.2	--	--	--
			01042	00041	C.4.2.2	--	--	--
			01042	00042	C.4.2.2	--	--	--
			01042	00043	C.7.1.1	--	--	--
			01042	00044	C.7.1.1	--	--	--
			01042	00045	C.7.1.1	--	--	--
	Davis, John G.	U.S. Nuclear Reg. Commission	01042	00046	C.7.2.2	--	--	--
			01042	00047	C.7.2.6	--	--	--
			01042	00048	C.4.3	--	--	--
			01042	00049	C.4.3	--	--	--
			01042	00050	C.4.3	--	--	--
			01042	00051	C.4.3	--	--	--

C.9-35

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01042	00052	C.4.3	--	--	--
			01042	00053	C.4.3	--	--	--
			01042	00054	C.4.3	--	--	--
			01042	00055	C.4.3	--	--	--
			01042	00056	C.4.3	--	--	--
			01042	00057	C.4.3	--	--	--
			01042	00058	C.6.5	--	--	--
			01042	00059	C.8.4	--	--	--
			01042	00060	C.7.2	--	--	--
			01042	00061	C.8.3	--	--	--
			01042	00062	C.5.4	--	--	--
			01042	00063	C.4.3	--	--	--
			01042	00064	C.7.2	--	--	--
			01042	00065	C.7.2.3	--	--	--
			01042	00066	C.4.1.3.4	--	--	--
			01042	00067	C.7.2.7	--	--	--
			01042	00068	C.6.5	--	--	--
			01042	00069	C.6.5	--	--	--
			01042	00070	C.7.3	--	--	--
			01042	00071	C.7.3	--	--	--
			01042	00072	C.7.3	--	--	--
			01042	00073	C.7.3	--	--	--
			01042	00074	C.7.3	--	--	--
			01042	00075	C.7.3	--	--	--
			01042	00076	C.2.4.1	C.7.3	--	--
			01042	00077	C.2.4.1	C.7.3	--	--
			01042	00078	C.4.3	--	--	--
			01042	00079	C.7.4.3	--	--	--
			01042	00080	C.7.4.5	--	--	--
			01042	00081	C.5.9	--	--	--
			01042	00082	C.5.9	--	--	--
			01042	00083	C.7.2	--	--	--
			01042	00084	C.6.3	--	--	--
			01042	00085	C.6.4	--	--	--
			01042	00086	C.6.5	--	--	--
			01042	00087	C.6.4	--	--	--
			01042	00088	C.7.2.4	--	--	--
			01042	00089	C.7.2.3	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01042	00090	C.7.2	--	--	--
			01042	00091	C.7.4	--	--	--
			01042	00092	C.7.4	--	--	--
			01042	00093	C.4.3	--	--	--
			01042	00094	C.2.4.1	C.7.3	--	--
			01042	00095	C.5.7	--	--	--
			01042	00096	C.5.1	--	--	--
			01042	00097	C.5.1	--	--	--
			01042	00098	C.5.1	--	--	--
			01042	00099	C.5.1	--	--	--
			01042	00100	C.5.1	--	--	--
			01042	00101	C.5.1	--	--	--
			01042	00102	C.5.1	--	--	--
			01042	00103	C.5.1	--	--	--
			01042	00104	C.5.1	--	--	--
			01042	00105	C.5.1	--	--	--
			01042	00106	C.5.1	--	--	--
			01042	00107	C.5.1	--	--	--
			01042	00108	C.5.1	--	--	--
			01042	00109	C.5.1	--	--	--
			01042	00110	C.5.1	--	--	--
			01042	00111	C.5.1	--	--	--
			01042	00112	C.5.1	--	--	--
			01042	00113	C.4.1.2.2	--	--	--
			01042	00114	C.5.1	--	--	--
			01042	00115	C.5.1	--	--	--
			01042	00116	C.5.1	--	--	--
			01042	00117	C.5.1	--	--	--
			01042	00118	C.5.1	--	--	--
			01042	00119	C.5.1	--	--	--
			01042	00120	C.5.1	--	--	--
			01042	00121	C.5.2	--	--	--
			01042	00122	C.5.1	--	--	--
			01042	00123	C.5.1	--	--	--
			01042	00124	C.5.1	--	--	--
			01042	00125	C.5.1	--	--	--
			01042	00126	C.5.1	--	--	--
			01042	00127	C.5.1	--	--	--

C.9-37

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			01042	00128	C.5.1	--	--	--
			01042	00129	C.5.1	--	--	--
			01042	00130	C.5.1	--	--	--
			01042	00131	C.5.2	--	--	--
			01042	00132	C.5.2	--	--	--
			01042	00133	C.5.2	--	--	--
			01042	00134	C.5.2	--	--	--
			01042	00135	C.5.2	--	--	--
			01042	00136	C.5.2	--	--	--
			01042	00137	C.5.2	--	--	--
			01042	00138	C.5.2	--	--	--
			01042	00139	C.5.2	--	--	--
			01042	00140	C.5.2	--	--	--
			01042	00141	C.5.2	--	--	--
			01042	00142	C.5.2	--	--	--
			01042	00143	C.5.2	--	--	--
			01042	00144	C.5.2	--	--	--
			01042	00145	C.5.2	--	--	--
			01042	00146	C.5.2	--	--	--
			01042	00147	C.5.2	--	--	--
			01042	00148	C.5.2	--	--	--
			01042	00149	C.5.2	--	--	--
			01042	00150	C.5.2	--	--	--
			01042	00151	C.5.2	--	--	--
			01042	00152	C.5.2	--	--	--
			01042	00153	C.5.2	--	--	--
			01042	00154	C.5.3	--	--	--
			01042	00155	C.5.3	--	--	--
			01042	00156	C.5.3	--	--	--
			01042	00157	C.5.3	--	--	--
			01042	00158	C.5.3	--	--	--
			01042	00159	C.5.3	--	--	--
			01042	00160	C.5.3	--	--	--
			01042	00161	C.5.2	--	--	--
			01042	00162	C.5.2	--	--	--
			01042	00163	C.5.4	--	--	--
			01042	00164	C.5.4	--	--	--
			01042	00165	C.5.5	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			01042	00166	C.5.5	--	--	--
			01042	00167	C.5.5	--	--	--
			01042	00168	C.5.7	--	--	--
			01042	00169	C.5.7	--	--	--
			01042	00170	C.5.7	--	--	--
			01042	00171	C.5.7	--	--	--
			01042	00172	C.5.7	--	--	--
			01042	00173	C.5.5	--	--	--
			01042	00174	C.5.8	--	--	--
			01042	00175	C.5.10	--	--	--
			01042	00176	C.5.10	--	--	--
			01042	00177	C.5.10	--	--	--
			01042	00178	C.8.1	--	--	--
			01042	00179	C.8.3	--	--	--
			01042	00180	C.8.3	--	--	--
			01042	00181	C.8.2	--	--	--
			01042	00182	C.8.2	--	--	--
			01042	00183	C.8.2	--	--	--
			01042	00184	C.8.2	--	--	--
			01042	00185	C.8.2	--	--	--
			01042	00186	C.8.2	--	--	--
			01042	00187	C.8.2	--	--	--
			01042	00188	C.8.4	--	--	--
			01042	00189	C.8.4	--	--	--
			01042	00190	C.8.4	--	--	--
			01042	00191	C.8.4	--	--	--
			01042	00192	C.2.8.3	C.6.5	--	--
			01042	00193	C.5.11	--	--	--
			01042	00194	C.5.11	--	--	--
			01042	00195	C.5.11	--	--	--
			01042	00196	C.5.11	--	--	--
			01042	00197	C.5.11	--	--	--
			01042	00198	C.5.11	--	--	--
			01042	00199	C.5.11	--	--	--
			01042	00200	C.5.11	--	--	--
			01042	00201	C.5.11	--	--	--
			01042	00202	C.5.11	--	--	--
			01042	00203	C.5.11	--	--	--

C.9-39

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01042	00204	C.5.11	--	--	--
			01042	00205	C.5.11	--	--	--
			01042	00206	C.5.11	--	--	--
			01042	00207	C.3.4.1	--	--	--
	Davis, John G.	U.S. Nuclear Reg. Commission	01043	00013	C.3.4.2.3	--	--	--
			01043	00014	C.3.4.3	--	--	--
			01043	00020	C.3.1.2	--	--	--
			01043	00105	C.2.4.1	--	--	--
			01043	00218	C.3.4.1	C.5.11	--	--
			01043	00219	C.3.4.1	--	--	--
	Davis, John G.	U.S. Nuclear Reg. Commission	01044	00011	C.3.4.2.3	--	--	--
			01044	00012	C.3.4.3	--	--	--
			01044	00014	C.7.3	--	--	--
			01044	00015	C.2.7	--	--	--
			01044	00200	C.3.4.1	--	--	--
			01044	00201	C.3.4.1	--	--	--
	Davis, John G.	U.S. Nuclear Reg. Commission	01036	00157	C.3.4.2.3	--	--	--
			01036	00158	C.3.4.3	--	--	--
	Finamore, Barbara	Natural Res. Defense Council	01244	00001	C.2.6.1	--	--	--
			01244	00002	C.2.1.1	--	--	--
			01244	00003	C.2.6.1	--	--	--
			01244	00004	C.2.6.1	--	--	--
			01244	00005	C.2.6.1	--	--	--
			01244	00006	C.2.6.1	--	--	--
			01244	00007	C.2.6.1	--	--	--
			01244	00008	C.2.4.1	--	--	--
			01244	00009	C.2.4.1	--	--	--
			01244	00010	C.2.4.1	--	--	--
			01244	00011	C.2.4.1	--	--	--
			01244	00012	C.2.4.1	--	--	--
			01244	00013	C.2.4.1	--	--	--
			01244	00014	C.2.6.1	--	--	--
			01244	00015	C.2.7	--	--	--
			01244	00016	C.2.1.1	--	--	--
	Garrison, Roy F.	U.S. Dept. of Energy	01677	00001	C.2.8.2	--	--	--
	Hirsch, Allan	U.S. Env. Protection Agency	01397	00001	C.3.4.3	--	--	--
			01397	00002	C.3.4.3	--	--	--

C.9-40

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01397	00003	C.3.4.1	---	---	---
			01397	00004	C.3.4.1	---	---	---
			01397	00005	C.3.4.3	---	---	---
			01397	00006	C.3.4.3	---	---	---
			01397	00007	C.7.3	C.2.4.1	---	---
			01397	00008	C.2.7	---	---	---
			01397	00009	C.2.7	---	---	---
			01397	00068	C.3.4.3	---	---	---
			01397	00082	C.5.1	---	---	---
			01397	00083A	C.5.1	---	---	---
			01397	00083B	C.4.1.2.2	---	---	---
			01397	00083C	C.4.1.2.2	---	---	---
			01397	00083D	C.4.1.2.2	---	---	---
			01397	00083E	C.4.1.2.2	---	---	---
			01397	00083F	C.7.4	---	---	---
			01397	00083G	C.4.1.2.2	---	---	---
			01397	00083H	C.4.1.2.2	---	---	---
			01397	00084A	C.4.1.1	---	---	---
			01397	00084B	C.4.1.1	---	---	---
			01397	00085	C.7.4.3	C.4.3	---	---
			01397	00086	C.6.5	---	---	---
			01397	00087	C.4.2	---	---	---
			01397	00093	C.3.1.2	---	---	---
			01397	00097	C.2.7.1	C.4.1.3	---	---
			01716	00001	C.2.8.2	---	---	---
			01275	00001	C.2.2.1	---	---	---
			01275	00002	C.2.7	---	---	---
			01275	00003	C.2.7	---	---	---
			01275	00004	C.3.3	---	---	---
			01275	00005	C.3.4.3	---	---	---
			01275	00006	C.2.7	---	---	---
			01275	00007	C.3.4.3	---	---	---
			01275	00008	C.3.4.3	---	---	---
			01275	00009	C.6.6	C.5.11	C.5.11	C.3.4.4
			01275	00010	C.5.1	C.5.11	C.3.4.4	---
			01275	00011	C.7.4.1	C.2.7	---	---
			01275	00012	C.4.3	C.2.8	---	---
			01275	000121	C.3.4.3	---	---	---

Hodel, Secretary Donald
Kearney, John J.

U.S. Dept. of Energy
Edison Electric Institute

C-9-41

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
			01275	00013	C.4.2.2	C.4.3	--	--
			01275	00015	C.8.2	C.2.7	--	--
			01275	00016	C.2.7	--	--	--
			01275	00017	C.2.1.1	--	--	--
			01275	00026	C.3.4.4	--	--	--
			01275	00034	C.2.7	--	--	--
			01275	00035	C.3.1	--	--	--
			01275	00036	C.7.4	--	--	--
			01275	00037	C.7.4.4	--	--	--
			01275	00038	C.2.7	--	--	--
			01275	00039	C.6.4	--	--	--
			01275	00040	C.7.2	--	--	--
			01275	00041	C.5.1	--	--	--
			01275	00042	C.5.1	--	--	--
			01275	00043	C.5.1	--	--	--
			01275	00044	C.5.1	--	--	--
			01275	00045	C.5.1	--	--	--
			01275	00046	C.5.3	--	--	--
			01275	00048	C.5.3	--	--	--
			01275	00049	C.2.7	--	--	--
			01275	00050	C.3.1	--	--	--
			01275	00051	C.2.7	--	--	--
			01275	00073	C.2.7	--	--	--
			01275	00075	C.2.7	--	--	--
			01275	00096	C.2.7	--	--	--
			01275	00097	C.4.3	C.4.2.2	--	--
			01275	00098	C.4.3	C.4.3	--	--
			01275	00099	C.7.1.1	C.7.2.3	C.7.2.3	C.7.1.1
			01275	00100	C.7.2.3	C.7.1.1	--	--
			01275	00101	C.7.2.3	C.7.1.1.3	C.7.1.1	--
			01275	00102	C.4.3	C.4.2.2	C.3.7	C.7.1
			01275	00103	C.4.2.2	C.3.7	C.7.1	--
			01275	00104	C.4.2.2	C.7.1	C.3.7	--
			01275	00108	C.6.6	C.6.5	--	--
			01275	00109	C.5.11	--	--	--
			01275	00110	C.5.11	C.5.11	--	--
			01275	00111	C.4.3	C.4.3	--	--
			01275	00112	C.5.11	C.5.11	C.5.11	--

C.9-42

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01275	00114	C.2.7	--	--	--
			01275	00115	C.2.7	--	--	--
			01275	00116	C.2.8.2	--	--	--
			01275	00117	C.3.4.1	--	--	--
			01275	00118	C.3.4.4	--	--	--
			01275	00119	C.3.4.3	--	--	--
			01275	00120	C.3.4.3	--	--	--
			01275	00121	C.3.4.3	--	--	--
			01275	00128	C.8.4	C.8.4	--	--
			01275	00129	C.2.7	C.5.7	--	--
	Kearns, Artis		01440	00001	C.7.3	--	--	--
			01440	00002	C.7.3	--	--	--
			01440	00003	C.2.4.1	--	--	--
			01440	00004A	C.2.8	--	--	--
			01440	00004B	C.2.4.1	--	--	--
	Magnees, III, Col. Thomas H.	Dept. of Army Corps of Engineers	02697	00023	C.2.4.1	--	--	--
	Martin, Terri	National Parks & Cons. Assc.	02195	00001	C.3.4.4	--	--	--
			02195	00009	C.3.4.4	--	--	--
	Parker, Frank L.	National Research Council	02669	00001	C.3.4.3	--	--	--
			02669	00002	C.3.4.3	--	--	--
			02669	00003	C.3.4.3	--	--	--
			02669	00004	C.3.4.3	--	--	--
			02669	00005	C.3.4.3	--	--	--
			02669	00006	C.3.4.3	--	--	--
			02669	00007	C.3.4.3	--	--	--
			02669	00008	C.3.4.3	--	--	--
			02669	00009	C.3.4.3	--	--	--
			02669	00010	C.3.4.3	--	--	--
			02669	00011	C.3.4.3	--	--	--
			02669	00012	C.3.4.3	--	--	--
			02669	00013	C.3.4.3	--	--	--
			02669	00014	C.3.4.3	--	--	--
			02669	00015	C.3.4.4	--	--	--
			02669	00016	C.3.4.3	--	--	--
			02669	00017	C.3.4.3	--	--	--
	Santman, L.D.	U.S. Dept. of Transportation	01568	00001	C.2.4.1	C.7.3	--	--
			01568	00002	C.2.4.1	--	--	--
			01568	00003	C.2.4.1	--	--	--

G.9-43

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia (continued)</u>								
			01568	00004	C.2.4.1	--	--	--
			01568	00005	C.2.4.1	--	--	--
			01568	00006	C.2.4.1	--	--	--
			01568	00007	C.2.4.1	--	--	--
			01568	00008	C.2.4.1	--	--	--
			01568	00009	C.2.4.1	--	--	--
			01568	00010	C.2.4.1	--	--	--
			01568	00011	C.2.4.1	--	--	--
			01568	00012	C.2.4.1	--	--	--
			01568	00013	C.2.4.1	--	--	--
			01568	00014	C.2.4.1	--	--	--
			01568	00015	C.2.4.1	--	--	--
			01568	00016	C.2.4.1	--	--	--
			01568	00017	C.2.4.1	--	--	--
			01568	00018	C.2.4.1	--	--	--
			01568	00022	C.2.7	--	--	--
			01568	00029	C.7.3	--	--	--
			01568	00030	C.7.3	--	--	--
			01568	00031	C.7.3	--	--	--
			01568	00032	C.7.3	--	--	--
			01568	00033	C.7.3	--	--	--
			01568	00034	C.7.3	--	--	--
Severance, Owen		Natl. Parks & Conservation Assoc.	01276	00001	C.3.1.3	--	--	--
			01276	00002	C.3.1.3	--	--	--
			01276	00003	C.3.1.3	--	--	--
			01276	00004	C.3.1.3	--	--	--
			01276	00008	C.3.1.3	--	--	--
			01276	00010	C.3.1.3	--	--	--
			01276	00018A	C.3.1.3	--	--	--
			01276	00026	C.3.1.3	--	--	--
			01276	00032	C.2.8.3	--	--	--
			01276	00034	C.2.6.1	--	--	--
			01276	00055	C.2.8.2	--	--	--
Shiflet, Thomas		U.S. Dept. of Agriculture	01238	00001	C.6.6	C.5.11	C.2.7	--
			01238	00003	C.4.1.1	C.4.1	C.4.1.1	--
			01238	00032	C.4.1.3.1	--	--	--
			01238	00033	C.3.4.4	--	--	--
Smith, David W.			00040	00001	C.2.1.1	--	--	--

C.9-44

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>District of Columbia</u> (continued)								
	Stennis, John	U.S. Senate	00040	00002	C.2.1.1	--	--	--
	Swift, Congressman Al	U.S. House of Representatives	01680	00001	C.3.1.2	--	--	--
			02617	00001	C.3.1.2	C.7.2	--	--
			02617	00002	C.2.1.1	--	--	--
			02617	00004	C.3.1	--	--	--
			02617	00005	C.3.1.2	--	--	--
			02617	00006	C.3.1.1	--	--	--
			02617	00010	C.3.1.2	--	--	--
			02617	00011	C.3.1.2	--	--	--
	Yeager, Brooks B.	Sierra Club	01239	00001	C.2.1.1	--	--	--
			01239	00002	C.2.2	--	--	--
			01239	00003A	C.3.1.1	--	--	--
			01239	00003B	C.3.1.2	--	--	--
			01239	00004	C.3.1.2	--	--	--
			01239	00005	C.3.1.2	--	--	--
			01239	00006	C.3.1.2	--	--	--
			01239	00007	C.3.1.3	--	--	--
			01239	00008	C.2.4.1	C.7.3	--	--
			01239	00009	C.2.6.1	--	--	--
			01239	00013	C.2.6.3	6.4	--	--
<u>Florida</u>								
	Holloway, Mrs. Anita		00555	00001	C.3.1.2	--	--	--
	Laping, Mrs. T.		00062	00001	C.3.4.4	--	--	--
	Votee, Deborah		02691	00001	C.7.2	--	--	--
	Williams, Jr., J.W.	Florida Power & Light Company	01556	00001	C.2.4.1	--	--	--
<u>Georgia</u>								
	Sokol, Jean	The Wilderness Society	00652	00004	C.3.4.4	--	--	--
	Yarbrough, Mrs. J. C.		00083	00001	C.3.1.2	--	--	--
			00083	00002	C.3.4.4	--	--	--
			00083	00003	C.2.8.3	--	--	--

C.9-45

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Idaho</u>								
	Anonymous	C.A.N.W.E	01162	00001	C.2.3.1	--	--	--
			01162	00002	C.2.4.1	--	--	--
			01162	00003	C.2.4.1	--	--	--
			01162	00004	C.2.4.1	--	--	--
	Brower, Cheryl		01162	00006	C.2.8.3	--	--	--
			02609	00001	C.3.1.2	--	--	--
			02609	00004	C.3.1.2	--	--	--
	Funderburg, Robert D.	State of Idaho	00173	00001	C.2.4.1	--	--	--
			00173	00002	C.2.4.1	--	--	--
			00173	00003	C.2.4.1	--	--	--
			00173	00004	C.2.4.1	--	--	--
	Hall, S.J.		00150	00001A	C.2.4.1	--	--	--
	Hanson, Wes & Gertie		01142	00001	C.2.4.1	--	--	--
			01142	00003	C.2.3.1	--	--	--
	Patchin, Margaret		01149	00001	C.2.4.1	--	--	--
	Pinkham, Allen V.	Nez Perce Tribal Exec. Comm.	01253	00001	C.2.7	--	--	--
			01253	00003	C.2.5.2	--	--	--
			01253	00004	C.3.4.4	--	--	--
			01253	00005	C.2.6.1	--	--	--
			01253	00006	C.2.5.1	--	--	--
			01253	00008	C.2.7	--	--	--
			01253	00015	C.2.1.2	--	--	--
			01253	00078	C.2.4.1	--	--	--
			01253	00103	C.3.4.1	--	--	--
			01253	00104	C.3.4.1	--	--	--
			01253	00105	C.3.4.1	--	--	--
			01253	00106	C.3.4.1	--	--	--
			01253	00107	C.3.4.1	--	--	--
			01253	00108	C.7.3	--	--	--
			01253	00109	C.7.3	--	--	--
			01253	00110	C.7.3	--	--	--
			01253	00111	C.7.3	--	--	--
			01253	00112	C.3.4.3	--	--	--
	Robinson, Mary & Dwight		01585	00001	C.2.4.1	--	--	--
			01585	00002	C.2.6.2	--	--	--

C.9-46

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Illinois								
	Dinelli, Wayne	DuPage Audubon Society	00149	00001	C.3.4.4	--	--	--
	Gursh, Marla Kay		00161	00001	C.3.1.2	--	--	--
			00161	00002	C.3.1.2	--	--	--
	McGuire, Margaret A.		00052	00001	C.3.4.4	--	--	--
	Rice, Larry		00172	00001	C.3.1.2	--	--	--
	Smith, Jill Janine		00146	00001	C.3.1.2	--	--	--
	Speron, Sam J.		00302	00001	C.3.4.4	--	--	--
			00302	00002	C.3.4.4	--	--	--
	Tsiang, Margaret		01071	00001	C.3.4.4	--	--	--
	Warble, Steve		01066	00001	C.3.4.4	--	--	--
	Wyatt, John J.	Illinois Central Gulf	01740	00001	C.2.8.2	--	--	--
Indiana								
	Read, Charlotte J.	Save the Dunes Council	00048	00001	C.3.1.2	--	--	--
Kansas								
		Boy Scouts of America, Pack 3	02736	00001	C.3.1.2	--	--	--
	Klamm, Erik		02737	00001	C.3.1.2	--	--	--
	Moore-Anderson, Carol J.		00034	00001	C.3.4.4	--	--	--
	Moore-Fleming, Delores B.		00036	00001	C.3.4.4	--	--	--
	Moore-Jones, Joan E.		00037	00001	C.3.4.4	--	--	--
	Russell, Derek		02738	00001	C.3.1.2	--	--	--
	Sperry, Theodore M.		00080	00001	C.3.1.2	--	--	--
	Tyseh, Nathan		02739	00001	C.3.1.2	--	--	--
Kentucky								
	Kelly, James C.		00197	00001	C.3.4.4	--	--	--
			00197	00004	C.3.1.2	--	--	--
Louisiana								
	Anonymous		02178	00004	C.3.1.2	--	--	--
			02178	00005	C.2.4.1	--	--	--
			02178	00006	C.2.4.1	--	--	--
			02178	00007	C.2.4.1	--	--	--

C.9-47

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Louisiana (continued)</u>								
		Bienville Parish Police Jury	02175	00001	C.3.1.2	--	--	--
			02175	00002	C.2.1.1	--	--	--
			02175	00003	C.2.4.3	--	--	--
			02175	00007	C.2.1.1	--	--	--
			02176	00001	C.3.1.2	--	--	--
			02176	00006	C.3.1.2	--	--	--
			02176	00008	C.2.3.2	--	--	--
			02176	00009	C.2.2	--	--	--
	Beatty, Mayor Lloyd		00910	00002	C.2.1.1	--	--	--
			00910	00003	C.3.4.4	--	--	--
			00910	00007	C.2.1.1	--	--	--
	Bohlinger, L. Hall		00906	00001	C.3.4.4	--	--	--
			00906	00002	C.2.1.2	--	--	--
			00906	00003	C.2.1.1	--	--	--
			00906	00004	C.2.1.1	--	--	--
			00906	00005	C.3.4.4	--	--	--
	Bohlinger, L. Hall		02172	00001	C.3.4.4	--	--	--
			02172	00002	C.2.2	--	--	--
			02172	00003	C.2.1.1	--	--	--
			02172	00004	C.2.3.3	--	--	--
			02172	00005	C.3.4.4	--	--	--
	Bohlinger, L. Hall	LA Dept. of Env. Quality	01368	00005	C.2.3.1	--	--	--
			01368	00006	C.2.7	--	--	--
			01368	00047	C.2.4.1	--	--	--
			01368	00048	C.2.4.1	--	--	--
			01368	00049	C.2.4.1	--	--	--
			01368	00050	C.2.4.1	--	--	--
			01368	00051	C.2.4.1	--	--	--
			01368	00053	C.7.3	--	--	--
			01368	00054	C.2.4.1	--	--	--
			01368	00055	C.2.4.1	--	--	--
			01368	00056	C.2.4.1	--	--	--
			01368	00057	C.2.4.1	--	--	--
			01368	00058	C.2.4.1	--	--	--
			01368	00059	C.7.3	--	--	--
			01368	00060	C.2.4.1	--	--	--
			01368	00062	C.2.4.1	--	--	--
			01368	00063	C.7.3	--	--	--

C.9-48

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Louisiana (continued)								
			01368	00064	C.7.3	--	--	--
			01368	00065	C.7.3	--	--	--
			01368	00110	C.3.1.1	--	--	--
			01368	00111	C.3.4.3	--	--	--
	Bohlinger, L. Hall	Office of Air Qual. & Nuclear Eng.	02168	00001	C.3.4.4	--	--	--
			02168	00002	C.2.2	--	--	--
			02168	00003	C.2.1.1	--	--	--
			02168	00004	C.2.1.1	--	--	--
			02168	00005	C.3.4.4	--	--	--
	Bohlinger, L. Hall	Office of Air Quality & Nuclear Eng.	02683	00001	C.2.7	--	--	--
			02683	00002	C.2.7	--	--	--
			02683	00003	C.2.7	--	--	--
			02683	00004	C.2.7	--	--	--
			02683	00005	C.2.7.1	--	--	--
			02683	00009	C.2.7	--	--	--
			02683	00013	C.2.7	--	--	--
			02683	00028	C.2.8.2	--	--	--
			02683	00030	C.3.1.2	--	--	--
			02683	00031	C.2.4.2	--	--	--
			02683	00060	C.2.4.1	--	--	--
			02683	00061	C.2.4.1	--	--	--
	Bohlinger, Hall		00898	00001	C.3.1.2	--	--	--
			00898	00002	C.2.1.2	--	--	--
			00898	00003	C.2.1.1	--	--	--
			00898	00004	C.2.1.1	--	--	--
			00898	00005	C.3.1.2	--	--	--
	Bohlinger, L. Hall	Office of Air Qual. & Nuclear Eng.	02684	00001	C.2.7	--	--	--
			02684	00002	C.2.7	--	--	--
			02684	00003	C.2.7	--	--	--
			02684	00004	C.3.1.2	--	--	--
			02684	00005	C.3.1.1	--	--	--
			02684	00006	C.2.7	--	--	--
			02684	00007	C.2.7	--	--	--
			02684	00008	C.2.7	--	--	--
			02684	00010	C.2.7	--	--	--
			02684	00011	C.2.7	--	--	--
			02684	00014	C.2.7	--	--	--
			02684	00015	C.2.7	--	--	--

C.9-49

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Louisiana (continued)</u>								
			02684	00016	C.2.7	--	--	--
			02684	00019	C.2.7	--	--	--
			02684	00020	C.2.7	--	--	--
			02684	00021	C.2.7	--	--	--
			02684	00022	C.2.1.1	--	--	--
			02684	00286	C.5.7	--	--	--
			02684	00287	C.2.4.1	--	--	--
			02684	00319	C.3.1.1	--	--	--
			02684	00326	C.2.4.1	--	--	--
			02684	00345	C.2.4.1	--	--	--
			02684	00346	C.2.4.1	--	--	--
			02684	00367	C.2.4.1	--	--	--
			02684	00492	C.3.4.3	--	--	--
			02684	00493	C.3.4.1	--	--	--
			02684	00494	C.3.4.1	--	--	--
			02684	00495	C.3.4.1	--	--	--
			02684	00496	C.2.4.1	--	--	--
			02684	00497	C.2.4.1	--	--	--
			02684	00498	C.2.4.1	--	--	--
			02684	00499	C.2.4.1	--	--	--
			02684	00501	C.2.4.1	--	--	--
			02684	00502	C.2.4.1	--	--	--
			02684	00503	C.2.4.1	--	--	--
			02684	00504	C.2.4.1	--	--	--
			02684	00505	C.2.4.1	--	--	--
			02684	00506	C.2.4.1	--	--	--
			02684	00507	C.2.4.1	--	--	--
			02684	00508	C.2.4.1	--	--	--
			02684	00509	C.2.4.1	--	--	--
			02684	00510	C.2.4.1	--	--	--
			02684	00511	C.2.4.1	--	--	--
			02684	00512	C.2.8.3	--	--	--
	Bohlinger, L. Hall	Office of Air Qual. & Nuclear Eng.	02685	00005	C.3.1.1	--	--	--
			02685	00007	C.3.4.3	--	--	--
			02685	00009	C.3.4.3	--	--	--
			02685	00016	C.3.1.2	--	--	--
			02685	00019	C.3.1.1	--	--	--
	Byars, Mayor Noel		00911	00001	C.3.4.4	--	--	--

C.9-50

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Louisiana (continued)								
			00911	00006	C.3.4.4	--	--	--
			00911	00008	C.3.4.4	--	--	--
	Collins, Harry		00920	00002	C.3.4.4	--	--	--
	Cramer, George		00904	00003	C.2.4.1	--	--	--
			00904	00004	C.2.4.1	--	--	--
			00904	00005	C.2.4.1	--	--	--
			00904	00006	C.2.6.1	--	--	--
	Cramer, George		02171	00001	C.2.4.1	--	--	--
			02171	00003	C.2.4.1	--	--	--
			02171	00004	C.2.4.1	--	--	--
			02171	00005	C.2.4.1	--	--	--
			02171	00006	C.2.4.1	--	--	--
			02171	00007	C.2.4.1	--	--	--
	Daigre, Glen		00899	00001	C.3.1.1	--	--	--
			00899	00002	C.2.4.1	--	--	--
	Fields, David		00909	00001	C.3.4.4	--	--	--
			00909	00002	C.2.1.1	--	--	--
			00909	00003	C.3.4	--	--	--
			00909	00007	C.2.1.1	--	--	--
	Garrett, Bruce		00913	00001	C.3.4.4	--	--	--
	Hammond, Frank		00919	00001	C.3.4.4	--	--	--
			00919	00002	C.3.4.4	--	--	--
	Henagan, L. A.		02169	00001	C.3.1.1	--	--	--
			02169	00002	C.2.4.1	--	--	--
	Henagon, L. A.	LA State Planning Office	02174	00001	C.3.1.1	--	--	--
			02174	00002	C.2.4.1	--	--	--
			02174	00003	C.2.4.1	--	--	--
	Lacour, SMS Henry J.	USAF Retired	00006	00001	C.2.3.1	--	--	--
			00006	00002	C.2.8	--	--	--
			00006	00003	C.3.4.4	--	--	--
	Lowe, Patsy		00917	00001	C.3.4.4	--	--	--
	Mailin, Ronald	Sierra Club	02631	00001	C.2.3.3	--	--	--
			02631	00002	C.3.1.2	--	--	--
			02631	00003	C.3.1.2	--	--	--
			02631	00004	C.2.4.1	--	--	--
			02631	00005	C.2.4.1	--	--	--
			02631	00006	C.2.3.1	--	--	--
	Martin, Ronald A.		00411	00001	C.2.3.3	--	--	--

G.9-51

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Louisiana (continued)</u>								
			00411	00002	C.3.1.2	--	--	--
			00411	00003	C.3.1.2	--	--	--
			00411	00004	C.7.3	--	--	--
			00411	00005	C.7.3	--	--	--
			00411	00006	C.2.3.1	--	--	--
	Martin, Ronald		00914	00001	C.3.1.2	--	--	--
			00914	00002	C.3.1.2	--	--	--
			00914	00003	C.2.4.1	--	--	--
			00914	00004	C.2.3.1	--	--	--
			00914	00007	C.2.4.1	--	--	--
			00914	00008	C.2.4.1	--	--	--
			00914	00009	C.2.4.1	--	--	--
			00914	00010	C.3.3.1	--	--	--
	McMullen, Ted		00908	00002	C.3.1.1	--	--	--
			00908	00003	C.2.4.1	--	--	--
	Moore-Iverson, Fannie F.		00047	00001	C.3.4.4	--	--	--
	Robertson, Bill	Webster Parish Police Jury	02177	00001	C.3.1.2	--	--	--
	Selbin, Joel		00903	00005	C.3.1.2	--	--	--
	Skibitzke, Herbert		00905	00001	C.2.7	--	--	--
	Tobin, Robert		00918	00001	C.3.4.4	--	--	--
<u>Maine</u>								
	Adams, David A		01193	00003	C.3.4.4	--	--	--
	Brainerd, John W.		00092	00001	C.3.4.4	--	--	--
<u>Maryland</u>								
	Drews, Kenneth A.		00089	00001	C.3.4.4	--	--	--
	Goff, Alice		01811	00001	C.3.4.4	--	--	--
	Solomon, Dr. Kenneth	Sheppard & Enoch Pratt Hospital	00086	00001	C.3.4.4	--	--	--
<u>Massachusetts</u>								
	Greene, Cathy C.		00656	00001	C.3.4.4	--	--	--
			00656	00005	C.3.4.3	--	--	--
			00656	00006	C.3.1.2	--	--	--
	Greone, Alan		00396	00002	C.3.1.2	--	--	--

C.9-52

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION					
					FIRST	SECOND	THIRD	FOURTH		
Massachusetts (continued)										
	Halpern, Harvey		01077	00001	C.3.1.2	--	--	--		
	Kesselman, Barry		00276	00001	C.3.4.4	--	--	--		
	Stedman, Anne B.		00353	00006	C.3.4.4	--	--	--		
	Watson, Wendy		02112	00004	C.3.1.2	--	--	--		
Michigan										
	Coyer, Gayle	Upper Peninsula Env. Coalition	00650	00002	C.3.1.2	--	--	--		
			00650	00003	C.3.4.4	--	--	--		
			00650	00004	C.3.4.4	--	--	--		
			00650	00005	C.3.1.1	--	--	--		
			00650	00006	C.3.1.2	--	--	--		
			00650	00007	C.3.1.2	--	--	--		
			00650	00010	C.2.4.1	--	--	--		
			00422	00002	C.3.4.4	--	--	--		
			Leighton, M. Martin, Dr. James E.	School of Public Health	02605	00001	C.3.1.2	C.3.1.3	--	--
					02605	00002	C.3.1.2	--	--	--
	02605	00003			C.5.3	--	--	--		
	02605	00004			C.7.2.7	--	--	--		
	02605	00005			C.7.2.7	--	--	--		
	02605	00006			C.7.2.7	--	--	--		
	02605	00007			C.6.5	--	--	--		
	02605	00008			C.6.5	--	--	--		
	02605	00009			C.6.6	--	--	--		
	02605	00010			C.6.6	--	--	--		
	02605	00011	C.7.3	--	--	--				
	02605	00012	C.4.1.4	--	--	--				
	02605	00013	C.6.3	--	--	--				
	02605	00014	C.5.2	--	--	--				
	Stone, G. W. E.		00489	00001	C.3.1.2	--	--	--		
Minnesota										
	Peterson, William V.		00134	00001	C.3.4.4	--	--	--		
	Schnabel, Daniel E.		00275	00001	C.3.4.4	--	--	--		
			00275	00004	C.2.8.1	--	--	--		

C.9-53

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi								
	Abbott, Carol		01963	00001	C.3.4.4	--	--	--
	Abbott, Chestre H.		01964	00001	C.3.4.4	--	--	--
	Abbott, Kelly J.		01999	00001	C.3.4.4	--	--	--
	Adamo, Vincent		00942	00001	C.3.4.4	--	--	--
			00942	00002	C.3.4.4	--	--	--
	Agar, Tina		01749	00001	C.3.4.4	--	--	--
	Allain, Governor Bill		01031	00001	C.3.1.2	--	--	--
			01031	00002	C.2.7	--	--	--
			01031	00003	C.3.4.4	--	--	--
			01031	00004	C.3.4.4	--	--	--
			01031	00005	C.3.4.4	--	--	--
			01031	00005A	C.2.1.1	--	--	--
			01031	00005B	C.3.4.4	--	--	--
			01031	00006	C.3.4.4	--	--	--
	Allen, Elizabeth		01936	00001	C.3.4.4	--	--	--
	Alvarado, Julie Elizabeth		01852	00001	C.3.4.4	--	--	--
	Anonymous		01637	00001	C.3.4.4	--	--	--
	Anonymous		01736	00001	C.2.8.2	--	--	--
	Anonymous		01800	00001	C.3.8	--	--	--
	Anonymous		01817	00001	C.3.4.4	--	--	--
	Anonymous		01906	00001	C.3.4.4	--	--	--
	Anonymous		01908	00001	C.3.1.2	--	--	--
	Anonymous		01940	00001	C.3.4.4	--	--	--
	Anonymous		01956	00001	C.3.4.4	--	--	--
	Anonymous		01968	00001	C.2.4.1	--	--	--
	Anonymous		01984	00001	C.3.4.4	--	--	--
		Home Builders Assn. of Jackson	01683	00001	C.3.4.4	--	--	--
		MS State Med. Assn. of Deleat.	01681	00001	C.2.8.2	--	--	--
		Mississippi Situation	01737	00001	C.2.8.2	--	--	--
		Pre School, Director	01814	00001	C.3.4.4	--	--	--
		Sierra Club Central MS Group	01607	00007	C.2.7	--	--	--
	Asche, Suzanne L.		01949	00001	C.3.4.4	--	--	--
	Atkins, James W.		01927	00001	C.2.4.1	--	--	--
	Austin, Virginia B.		00217	00001	C.3.4.4	--	--	--
	Backstrom, Kally		01000	00001	C.3.4.4	--	--	--
	Backstrom, Kally		01641	00001	C.3.4.4	--	--	--
	Baillieul, Thomas	NWTS Program Office	01744	00001	C.2.8.2	--	--	--
	Bakker, Shirley J.		01777	00001	C.3.4.4	--	--	--

C.9-54

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Bakker, Adolph R.		01778	00001	C.3.4.4	--	--	--
	Bakker, Terry		01780	00001	C.3.4.4	--	--	--
	Baldwin, Rev. Fred		00993	00002	C.3.4.4	--	--	--
			00993	00003	C.3.4.4	--	--	--
	Ball, Mary		01623	00001	C.3.4.4	--	--	--
	Ball, Wilbur G.	MS Dept. of Energy and Trans.	01370	00001	C.2.2.1	--	--	--
			01370	00002	C.3.1.2	--	--	--
			01370	00003	C.2.2	--	--	--
			01370	00004	C.2.1.1	--	--	--
			01370	00005	C.3.4.4	--	--	--
			01370	00006	C.2.1.2	--	--	--
			01370	00007	C.2.1.2	--	--	--
			01370	00008	C.3.1.1	--	--	--
			01370	00009	C.3.4.3	--	--	--
			01370	00010	C.3.4.3	--	--	--
			01370	00011	C.3.4.3	--	--	--
			01370	00012	C.3.4.3	--	--	--
			01370	00013	C.3.4.3	--	--	--
			01370	00014	C.3.4.3	--	--	--
			01370	00015	C.3.4.3	--	--	--
			01370	00016	C.3.4.2.1	--	--	--
			01370	00017	C.3.4.3	--	--	--
			01370	00018	C.3.4.1	C.3.4.2.2	--	--
			01370	00019	C.3.4.3	--	--	--
			01370	00020	C.3.4.3	--	--	--
			01370	00022	C.3.4.1	--	--	--
			01370	00024	C.3.4.2.1	--	--	--
			01370	00025	C.3.4.2.2	--	--	--
			01370	00026	C.3.4	--	--	--
			01370	00170	C.3.4.2.2	--	--	--
			01370	00171	C.3.4.2.1	--	--	--
			01370	00191	C.7.1.2	--	--	--
			01370	00200	C.2.1	--	--	--
			01370	00203	C.2.7	--	--	--
			01370	00204	C.3.4.3	--	--	--
			01370	00221	C.2.1.2	--	--	--
	Banch, Jack	City of Gulfport	01702	00001	C.3.4.4	--	--	--

C.9-55

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Mississippi (continued)</u>								
	Barsinew, M. J.	NPO/DOE	01702	00002	C.3.4.4	--	--	--
	Bartlett, F. G.		01723	00001	C.2.8.2	--	--	--
	Basnight, Melissa L.		01941	00001	C.3.1.2	--	--	--
	Bates, Jr., Hughie G.		01799	00001	C.3.1.2	--	--	--
	Baumhauer, Dr. & Mrs. Emile		01812	00001	C.3.4.4	--	--	--
	Beardsley, Derek		01951	00001	C.3.4.4	--	--	--
	Beaugez, Hope Alison		00990	00001	C.3.4.4	--	--	--
	Beaugez, Robert L.		01902	00001	C.3.4.4	--	--	--
	Bellande, Mary H.		01904	00001	C.3.4.4	--	--	--
	Bennett, Lloyd U.		01962	00001	C.3.4.4	--	--	--
	Bennett, Kanzetty F.		01970	00001	C.3.4.4	--	--	--
	Bergeron, Dixie		01973	00001	C.3.4.4	--	--	--
	Bess, V.		Richton Elementary School	01212	00001	C.3.4.4	--	--
	Billington, W.	02000		00001	C.3.1.2	--	--	--
	Birkoliw, Lee D.	01886		00001	C.3.4.4	--	--	--
	Blackman, Carolyn	02703		00001	C.3.4.4	--	--	--
		02703		00002	C.2.1.5	--	--	--
		01017		00002	C.3.4.4	--	--	--
		01017		00007A	C.2.8.3	--	--	--
		01017		00007B	C.3.4.4	--	--	--
		01017		00008	C.3.1.2	--	--	--
		01017		00011	C.3.4.4	--	--	--
		01017		00016	C.3.4.4	--	--	--
		01019		00001	C.3.1.2	--	--	--
	Blackman, Joe	01019		00002	C.2.5.2	--	--	--
		01019	00007	C.3.4.4	--	--	--	
	Blanton, Tom	00949	00001	C.2.8	--	--	--	
		00949	00006	C.2.7	--	--	--	
		00949	00008	C.3.4.4	--	--	--	
	Blanton, Tom	00989	00001	C.3.4.4	--	--	--	
		00989	00010	C.2.3.2	--	--	--	
		00989	00011	C.2.1.1	--	--	--	
	Blessey, Mayor Gerald	00935	00001	C.3.1.2	--	--	--	
		00935	00002	C.3.1.2	--	--	--	
		00935	00006	C.7.3	--	--	--	
		00935	00009	C.3.4.4	--	--	--	
		01697	00001	C.3.4.4	--	--	--	
	Blessey, Ann	01887	00001	C.3.4.4	--	--	--	

G.9-56

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Blessey, Mayor Gerald	City of Biloxi	01686	00001	C.3.4.4	--	--	--
	Bograd, Jessie		01863	00001	C.3.4.4	--	--	--
	Boland, Mrs. Michael J.		01618	00001	C.3.4.4	--	--	--
			01618	00002	C.2.4.1	--	--	--
	Boland, Mike		01619	00001	C.3.4.4	--	--	--
	Boland, Molly		01620	00001	C.3.4.4	--	--	--
	Boland, Jon		01622	00001	C.3.4.4	--	--	--
	Bolen, Jr., James E.		01751	00001	C.3.4.4	--	--	--
			01751	00005	C.3.4.4	--	--	--
	Bossier, Mollie		00972	00001	C.3.4.4	--	--	--
	Bossier, Regina	Christ Episcopal Day School	01665	00001	C.3.4.4	--	--	--
	Bossier, Regina		01667	00001	C.3.4.4	--	--	--
	Boushay, Kim		00983	00001	C.3.4.4	--	--	--
	Bowman, Teresa		01898	00001	C.3.4.4	--	--	--
	Bowman, Calvin D.		01899	00001	C.3.4.4	--	--	--
	Bowman, Raymond I.		01915	00001	C.3.4.4	--	--	--
	Boyll, Jamie		01035	00001	C.3.4.4	--	--	--
			01035	00006	C.2.4.1	--	--	--
			01035	00007	C.2.4.1	--	--	--
			01035	00010	C.2.3.3	--	--	--
			01035	00011	C.2.4.1	--	--	--
			01035	00012	C.2.5.1	--	--	--
			01035	00013	C.3.4.4	--	--	--
	Brackeen, Charlie D.	State of MS Military Dept.	01301	00002	C.3.2	--	--	--
			01301	00003	C.3.1.2	--	--	--
			01301	00004	C.2.3	--	--	--
			01301	00006	C.3.4.3	--	--	--
			01301	00009	C.2.4.1	--	--	--
			01301	00010	C.3.1.2	--	--	--
			01301	00012	C.2.3.2	--	--	--
			01301	00032	C.2.8.2	--	--	--
	Breal, B. J.		01876	00001	C.3.4.4	--	--	--
	Brooks, Sarah		01787	00001	C.2.8.2	--	--	--
			01787	00002	C.3.1.2	--	--	--
	Brown, Stephanie		02016	00001	C.3.4.4	--	--	--
	Bryant, Candace I.		01754	00001	C.2.1.1	--	--	--
	Bryant, William Rae		01783	00001	C.3.4.4	--	--	--
	Buchanan, Michael		01774	00001	C.3.1.2	--	--	--

C.9-57

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Mississippi (continued)</u>								
	Buchanan, Jennifer		01862	00001	C.3.4.4	--	--	--
	Bullard, Bettie Posey		01765	00001	C.3.4.4	--	--	--
	Burgess, R. H.		01616	00001	C.3.4.4	--	--	--
	Burke, John W.		02025	00001	C.3.4.4	--	--	--
	Bush, Katherine P.		01640	00001	C.5.4	C.6.3	C.3.4.3	--
	Byrd, Gail Hinton		01872	00001	C.3.4.4	--	--	--
	Calhoun, Dr. Joanne P.		02047	00001	C.3.4.4	--	--	--
	Calhoun, Joseph W.		02048	00001	C.2.8.2	--	--	--
	Callim, Dorothy M.		02018	00001	C.3.1.2	--	--	--
	Cameron, Mack	Office of the Attny General	01029	00002A	C.2.1.1	--	--	--
			01029	00002B	C.2.1.5	--	--	--
			01029	00003	C.2.1.1	--	--	--
			01029	00005	C.3.4.3	--	--	--
			01029	00006	C.3.4.1	--	--	--
			01029	00007	C.3.4.4	--	--	--
	Cameron, Mack	Office of the Attny General	01605	00002	C.2.3.3	--	--	--
			01605	00002A	C.2.1.1	--	--	--
			01605	00002B	C.2.1.5	--	--	--
			01605	00003	C.2.1.1	--	--	--
			01605	00005A	C.3.4.3	--	--	--
			01605	00005B	C.3.4.3	--	--	--
	Canizaro, Robert H.	AIA	01679	00001	C.3.4.4	--	--	--
	Caranna, Cono		00938	00001	C.3.4.4	--	--	--
			00938	00002	C.3.1.2	--	--	--
			00938	00003	C.3.4.4	--	--	--
	Carter, Amanda		01878	00001	C.3.4.4	--	--	--
	Carter, Mary F.		01937	00001	C.3.4.4	--	--	--
	Cates, Arlene		01922	00001	C.3.1.2	--	--	--
	Chipley, Dixie Wright		00979	00001	C.3.4.4	--	--	--
	Chipley, Robert		00986	00001	C.3.4.4	--	--	--
	Clement, Sheri		01798	00001	C.3.1.2	--	--	--
	Cleveland, Mr. & Mrs. Milton		01782	00001	C.3.4.4	--	--	--
	Cochran, Senator Thad	CAND	01661	00001	C.3.4.4	--	--	--
	Coffey, Davin		00964	00001	C.3.1.2	--	--	--
			00964	00002	C.3.1.2	--	--	--
			00964	00003	C.3.1.2	--	--	--
	Cole, Dorothy		00996	00001	C.3.4.4	--	--	--
			00996	00007	C.2.4.1	--	--	--

C.9-58

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
			00996	00010	C.3.4.4	--	--	--
			00996	00011	C.3.1.1	--	--	--
			00996	00012	C.3.4.3	--	--	--
			00996	00015	C.3.1.1	--	--	--
			00996	00016	C.2.1.1	--	--	--
	Cole, Bonnie	Perry County CAND	01003	00001	C.2.1.1	--	--	--
	Cole, Dorothy G.		01282	00001	C.3.4.4	--	--	--
	Cole, Dorothy G.		01636	00006	C.7.3	--	--	--
			01636	00009	C.3.1.2	--	--	--
			01636	00010	C.3.4.3	--	--	--
			01636	00011	C.3.1.2	--	--	--
			01636	00014	C.3.1.1	--	--	--
			01636	00015	C.2.1.5	--	--	--
			01636	00021A	C.2.3	--	C.4.1	--
			01636	00021B	C.2.3.1	--	C.4.1	--
		01636	00022	C.3.4.4	--	--	--	
	Collins, Ken		01942	00001	C.3.4.4	--	--	--
	Collins, Stephen F.		02001	00001	C.3.4.4	--	--	--
	Collins, Gloria C.		02002	00001	C.3.4.4	--	--	--
	Collins, Terese P.		02020	00001	C.2.8.1	--	C.3.4.4	--
			02020	00001A	C.3.4.4	--	--	--
			02020	00001B	C.2.8.1	--	--	--
	Collins, Daniel G.		02023	00001	C.3.1.2	--	--	--
			02023	00002	C.2.4.1	--	--	--
			02023	00003	C.3.1.2	--	--	--
	Collins, Joseph		02026	00001	C.3.1.2	--	--	--
	Comeaux, Audry		01892	00001	C.3.4.4	--	--	--
	Corban/Blackwell, L. C./ Leonard	Harrison County Bar Assn.	01693	00001	C.3.4.4	--	--	--
	Cousins, Muriel M.		02059	00001	C.3.4.4	--	--	--
	Covington, Steve		00962	00001	C.3.4.4	--	--	--
			00962	00002	C.2.3.3	--	--	--
			00962	00003	C.2.1.1	--	--	--
			00962	00004	C.3.4.4	--	--	--
	Cox, Mrs. Charles M.		01855	00001	C.3.1.2	--	--	--
	Cox, C. M.		02036	00001	C.3.4.4	--	--	--
	Crotts, Lamar M.		00644	00001	C.3.4.4	--	--	--
	Crowell, Jr., Robert		01755	00001	C.3.4.4	--	--	--
	Cruthirds, Mark	01839	00001	C.3.4.4	--	--	--	

C.9-59

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Cruthirds, Jamie L.		01840	00001	C.3.4.4	--	--	--
	Cumbest/Littlejohn, Lum R./Clark	MS Assn. of Supervisors	01678	00001	C.3.4.4	--	--	--
	Curtis, John S.		01654	00001	C.3.4.4	--	--	--
	Daneson, Mrs. William		01965	00001	C.2.4.1	--	--	--
			01965	00002	C.3.4.4	--	--	--
	Daugherty, Yvonne		01810	00001	C.3.4.4	--	--	--
	Dayenport, Shirley H.		01894	00001	C.3.1.2	--	--	--
	David, Monte J.		01847	00001	C.3.4.4	--	--	--
			01847	00002	C.2.8.2	--	--	--
	Davies, Agnes	League of Women Voters	01684	00001	C.3.4.4	--	--	--
	Davis, O. J.		00982	00003	C.3.1.2	--	--	--
			00982	00004	C.3.1.2	--	--	--
			00982	00005	C.2.8.2	--	--	--
	Davis, Charles		00991	00001	C.3.4.4	--	--	--
	Davis, Clyde A.		01757	00001	C.2.3	--	--	--
			01757	00001A	C.3.4.4	--	--	--
			01757	00001B	C.2.8.2	--	--	--
			01757	00001C	C.2.8.1	--	--	--
	Dedeaux-Jones, Kim		02037	00001	C.3.1.2	--	--	--
	Dehmer, Dorothy Coco		01614	00001	C.3.4.4	--	--	--
	Dewitt, Wendy	Richton Elementary School	01210	00001	C.3.4.4	--	--	--
	Dix, Frank		01974	00001	C.3.4.4	--	--	--
	Dollar, Dennis		00945	00001	C.2.1.2	--	--	--
			00945	00002	C.3.4.4	--	--	--
			00945	00003	C.2.4.1	--	--	--
			00945	00004	C.3.1.2	--	--	--
			00945	00005	C.3.1.2	--	--	--
	Domino, S. S.		01997	00001	C.3.4.4	--	--	--
	Dossett, Dorothy		00368	00001	C.2.4.1	--	--	--
			00368	00002	C.3.1.2	--	--	--
			00368	00003	C.3.1.2	--	--	--
	Dubaz, Gary A.		01976	00001	C.3.4.4	--	--	--
	Dubaz, Stephen		01977	00001	C.3.1.2	--	--	--
	Dubrusson, Wanda		01655	00001	C.3.1.2	--	--	--
	Duffy, Mark W.		01856	00001	C.3.1.2	--	--	--
	Edgeworth, Lucille E.		01102	00001	C.3.4.4	--	--	--
	Edwards, Tara	Richton Elementary School	01218	00001	C.3.4.4	--	--	--
	Eldridge, Martha		01795	00001	C.3.4.4	--	--	--

C.9-60

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Ellery, Mitchell	MS State Representative	01660	00001	C.3.4.4	--	--	--
	Ellington, Win		01617	00001	C.3.4.4	--	--	--
	Ellytor, Clela Elaine		01615	00001	C.3.4.4	--	--	--
	Evans, Mary L.		00973	00003	C.3.1.2	--	--	--
			00973	00005	C.3.4.4	--	--	--
			00973	00006	C.3.4.4	--	--	--
			00973	00007	C.3.1.2	--	--	--
			00973	00008	C.3.1.2	--	--	--
	Evans, Mrs. Sampson		02019	00001	C.3.4.4	--	--	--
	Farris, Scott		00226	00001	C.3.4.4	--	--	--
	Fears, Beulah Bessie		01753	00001	C.3.1.2	--	--	--
	Fears, Robert O.		01761	00001	C.3.4.4	--	--	--
	Ferrill, Ssan		02060	00001	C.3.4.4	--	--	--
	Findeiser, Audrey A.		01790	00001	C.3.4.4	--	--	--
	Finn, Donald F.X.		00129	00001	C.2.1.1	--	--	--
			00129	00002	C.2.2.1	--	--	--
			00129	00003	C.2.3.1	--	--	--
			00129	00004	C.2.3.1	--	--	--
			00129	00005	C.2.4.1	--	--	--
			00129	00011	C.2.3.1	--	--	--
			00129	00012	C.2.3.1	--	--	--
	Finn, Donald F. X.		01028	00001	C.2.1.1	--	--	--
			01028	00002	C.2.1.1	--	--	--
			01028	00003	C.2.1.1	--	--	--
			01028	00004	C.2.1.1	--	--	--
			01028	00005	C.2.2.1	--	--	--
			01028	00006	C.3.1.1	--	--	--
			01028	00007A	C.2.2.1	--	--	--
			01028	00007B	C.2.1.2	--	--	--
			01028	00010A	C.3.4.2.2	--	--	--
			01028	00014	C.3.4.2.1	--	--	--
			01028	00016	C.2.1.5	--	--	--
			01028	00017	C.2.3.1	--	--	--
			01028	00019	C.3.4.3	--	--	--
			01028	00020	C.2.3.1.2	--	--	--
			01028	00021	C.2.1.1	--	--	--
	Finn, Donald F. X.		01604	00001	C.2.1.1	--	--	--
			01604	00002	C.2.1.1	--	--	--

C.9-61

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Mississippi (continued)</u>								
			01604	00003	C.2.1.1	--	--	--
			01604	00004	C.3.1.1	--	--	--
			01604	00005	C.3.1.1	--	--	--
			01604	00006A	C.2.2.1	--	--	--
			01604	00006B	C.2.1.2	--	--	--
			01604	00008	C.2.4.1	--	--	--
			01604	00014	C.2.3.1	--	--	--
			01604	00016	C.2.3.1	--	--	--
			01604	00018	C.2.1.1	--	--	--
			01026	00001	C.2.1.1	--	--	--
	Fisher, Larry		01603	00001	C.2.1.1	--	--	--
	Fisher, Larry J.		01891	00001	C.3.4.4	--	--	--
	Fitch, Richard R.		01893	00001	C.3.4.4	--	--	--
	Fitch, Barbara Jo		01653	00001	C.3.4.4	--	--	--
	Fitzpatrick, MaryJoan G.		01653	00002	C.5.7	--	--	--
	Flake, Mrs. Lilly Pearl		01865	00001	C.3.1.2	--	--	--
	Flint, Stan		00937	00001	C.2.1.1	--	--	--
			00937	00002	C.2.1.1	C.2.1.2	--	--
			00937	00003A	C.3.4.4	--	--	--
			00937	00003B	C.3.4.4	--	--	--
	Flint, Stan		00987	00001	C.3.4.4	--	--	--
			00987	00002	C.3.1.2	--	--	--
			00987	00003	C.3.4.4	--	--	--
			00987	00004	C.3.4.4	--	--	--
			00987	00005	C.3.4.4	--	--	--
			00987	00008	C.3.4.4	--	--	--
			00987	00013	C.3.1.1	--	--	--
			00987	00014	C.2.1.1	--	--	--
			00987	00017	C.2.1.1	--	--	--
			00987	00018	C.2.1.1	--	--	--
			00987	00019	C.2.1.1	--	--	--
	Flint, Stanley D.	CAND	01675	00001	C.3.1.2	--	--	--
			01675	00002	C.3.1.1	--	--	--
			01706	00001	C.3.4.4	--	--	--
			01708	00001	C.2.1.1	--	--	--
			01712	00001	C.2.8.2	--	--	--
	Flint, Stanley D.	MS House of Representatives	01671	00001	C.2.1.2	--	--	--

C.9-62

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Flint, Stan	CAND	01713	00001	C.2.8.2	--	--	--
			01715	00001	C.2.8.2	--	--	--
	Flint/Williams, Candace/Mitzi		01674	00001	C.3.4.4	--	--	--
	Ford, Robert		00960	00001	C.3.4.4	--	--	--
			00960	00002	C.3.4.4	--	--	--
			00960	00003	C.2.4.1	--	--	--
			00960	00005	C.2.1.1	--	--	--
			00960	00006	C.2.8	--	--	--
			00960	00008A	C.2.1.2	C.2.1.1	--	--
	Ford, Twila		01789	00001	C.3.4.4	--	--	--
	Ford, Jr., Robert		01797	00001	C.3.1.2	--	--	--
	Forenand, Diane L.		01920	00001	C.3.4.4	--	--	--
	Forsythe, Ron	Mississippi E & T Board	01727	00001	C.2.8.2	--	--	--
	Forsythe, Ron		01728	00001	C.2.8.2	--	--	--
	Forsythe, Ron		01732	00001	C.2.8.2	--	--	--
	Fortenberry, Annie V.		01982	00001	C.3.4.4	--	--	--
	Foshee, Jamie and Linda		02705	00001	C.3.1.2	--	--	--
			02705	00002	C.3.4.4	--	--	--
	Foster, James T.		01986	00001	C.3.4.4	--	--	--
	Foster, Patti		01988	00001	C.3.1.2	--	--	--
	Foushee, Jr., Mrs. William H.		01613	00001	C.3.4.4	--	--	--
	Franck, Dorothy Walker		01621	00001	C.3.4.4	--	--	--
	Franks, Jim		01796	00001	C.3.4.4	--	--	--
	Franz, Becky		01885	00001	C.3.4.4	--	--	--
	Gallary, Wayne L.		01838	00001	C.2.4.2	--	--	--
	Garrett, Connie M.		01947	00001	C.3.4.4	--	--	--
	Gast, Mr. & Mrs. Fred C.		01946	00001	C.3.4.4	--	--	--
	Gaston, C. D.	MS Psychologist Association	01691	00001	C.3.4.4	--	--	--
			01691	00002	C.3.1.2	--	--	--
			01691	00003	C.3.4.4	--	--	--
	George, Critz H.	Office of Waste Isolation	01741	00001	C.2.8.2	--	--	--
	Gibbens/Price, Margaret C./Helene C.	Hancock Cty. Historical Society	01692	00001	C.3.4.4	--	--	--
	Gilbert, Valerie		01874	00001	C.3.4.4	--	--	--
	Gilliam, Dr. Scott & Evelyn		02709	00001	C.3.1.2	--	--	--
			02709	00002	C.3.1.2	--	--	--
	Gillis, Walter		01027	00001	C.3.4.4	--	--	--
	Goarskill, Kayleey	Richton Elementary School	01214	00001	C.3.4.4	--	--	--
	Gollot, Senator	U. S. Senate	01699	00001	C.3.4.4	--	--	--

C.9-63

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Mississippi (continued)</u>								
	Gonzalez, Jennifer Crowell		01752	00001	C.3.4.4	--	--	--
	Gottsche, Joanna M.		01975	00001	C.3.1.2	--	--	--
	Goundas, Joy Harrison		01829	00001	C.3.4.4	--	--	--
	Graley, Carolyn		02024	00001	C.3.4.4	--	--	--
	Green, Janet		00977	00001	C.3.1.2	--	--	--
	Green, John		01024	00002	C.3.4.4	--	--	--
	Green John	DOE & DOT Nuclear Waste Division	01601	00001	C.2.8.2	--	--	--
			01601	00002	C.3.4.4	--	--	--
	Green, John	DOE and Transportation	01745	00001	C.2.8.2	--	--	--
	Green, John	Dept. Energy and Transportation	00505	00006	C.2.7	--	--	--
	Green, John	E & T Board, MS	01724	00001	C.2.8.2	--	--	--
	Green, John	Mississippi E & T Board	01722	00001	C.2.8.2	--	--	--
	Green, John		01733	00001	C.2.8.2	--	--	--
	Griffin, Priscilla O.		01868	00001	C.3.4.4	--	--	--
	Gutierrez, Paige		00939	00001	C.3.4.4	--	--	--
			00939	00002	C.3.1.2	--	--	--
	Hague, Douglas and Renee		01944	00001	C.3.1.2	--	--	--
	Haig, Doug		00957	00001	C.3.4.4	--	--	--
			00957	00002	C.3.4.4	--	--	--
	Hall, John		01823	00001	C.3.4.4	--	--	--
	Hall, Representative L.	MS Legislature	01658	00001	C.2.8.2	--	--	--
	Halthu, Cynthia R.		01833	00001	C.3.4.4	--	--	--
	Hamilton, Pam		01023	00001	C.3.1.2	--	--	--
			01023	00002	C.2.1.1	--	--	--
			01023	00003	C.3.4.4	--	--	--
	Hamilton, Clarence W.		01835	00001	C.3.4.4	--	--	--
	Hammett, Elisabeth H.		01961	00001	C.3.4.4	--	--	--
	Hammond, William T. & Lois B.		01959	00001B	C.2.8.2	--	--	--
	Hand, Charles Ray		01786	00001	C.3.4.4	--	--	--
	Hansen, Dorothy		01842	00001	C.3.4.4	--	--	--
	Hansen, William Mark		01844	00001	C.3.4.4	--	--	--
	Harris, Annette		01816	00001	C.3.1.2	--	--	--
	Harris, Bill	The Biloxi Jaycees	01690	00001	C.3.4.4	--	--	--
	Harrison, Timothy M.		01828	00001	C.3.4.4	--	--	--
	Havens, Lynn	CAND	01673	00001	C.3.4.4	--	--	--
	Heller, Earl G.		01801	00001	C.2.8.2	--	--	--
	Herrell, Vicki		01030	00001	C.3.4.3	--	--	--
			01030	00002C	C.2.4.4	--	--	--

C.9-64

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
			01030	00002D	C.2.4.4	--	--	--
			01030	00003	C.2.3.1	--	--	--
	Herrell, Vicki		01606	00001	C.3.4.3	--	--	--
			01606	00006	C.3.4.4	--	--	--
			01606	00007	C.3.4.4	--	--	--
	Hickey, Sylvia		01764	00001	C.3.4.4	--	--	--
	Hicks, Swink		01032	00009	C.3.1.2	--	--	--
	Hight, Anna		02015	00001	C.3.1.2	--	--	--
	Hilliard, Barry A.		01785	00001	C.3.4.4	--	--	--
	Hinton, Rev. Archie		01020	00001	C.3.4.4	--	--	--
			01020	00002	C.3.4.4	--	--	--
	Hinton, Paige		01657	00001	C.3.1.2	--	--	--
	Hokinker, Jeannine		00969	00001	C.3.4.4	--	--	--
			00969	00002	C.3.1.2	--	--	--
			00969	00003	C.2.3.2	--	--	--
			00969	00004	C.3.4.4	--	--	--
	Holt, Maurite E.		01808	00001	C.3.4.4	--	--	--
	Horgan, Dana		01905	00001	C.3.4.4	--	--	--
	Howell, Arlie		01726	00001	C.2.8.2	--	--	--
	Howell, Arlie		01742	00001	C.2.8.2	--	--	--
	Howell, Arlie	Mississippi Consultant	01721	00001	C.2.8.2	--	--	--
	Howell, Arlie		01729	00001	C.2.8.2	--	--	--
	Howell, Arlie		01730	00001	C.2.8.2	--	--	--
	Howell, Arlie	Mississippi State	01718	00001	C.2.8.2	--	--	--
	Huddleston, Joy		01805	00001	C.2.3.1	--	--	--
			01805	00002	C.2.8.2	--	--	--
	Hudson, Tom	Sierra Club, Mississippi Chapter	01272	00009	C.2.4.3	--	--	--
			01272	00016	C.3.4.1	--	--	--
			01272	00017	C.3.4.1	--	--	--
			01272	00018	C.3.4.1	--	--	--
			01272	00034A	C.3.1.1	--	--	--
	Hughes, Ellise H.		02051	00001	C.3.4.4	--	--	--
	Hughes, Inez		02058	00001	C.3.4.4	--	--	--
	Humphrey, Cindy	Westinghouse	01748	00001	C.2.8.2	--	--	--
	Humphries, Margaret		01831	00001	C.3.4.4	--	--	--
	Humphries, John		01834	00001	C.3.4.4	--	--	--
	Hunt, Dianne R.		01900	00001	C.3.1.2	--	--	--
	Hussey, Phyllis		02003	00001	C.3.4.4	--	--	--

C.9-65

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Hutto, Jr., Andrew Clifton		01943	00001	C.2.1.2	--	--	--
	Ingram, John		01987	00001	C.3.4.4	--	--	--
	Iverson, Eric		01998	00001	C.3.4.4	--	--	--
	Jackson, Lenn		01624	00001	C.3.4.4	--	--	--
	Jacquet, Janie		01824	00001	C.3.4.4	--	--	--
	John, William E.		02041	00001	C.3.1.2	--	--	--
	Johnson, Solon W.		01859	00001	C.3.4.4	--	--	--
	Johnson, Elizabeth M.		01861	00001	C.3.4.4	--	--	--
	Johnston, Juliet		01627	00001	C.3.1.2	--	--	--
			01627	00002	C.2.4.1	--	--	--
	Johnston, Elta P.	Junior League of Jackson, Inc.	01609	00001	C.3.4.4	--	--	--
			01609	00002	C.2.1.1	--	--	--
			01609	00009	C.2.4.1	--	--	--
			01609	00010	C.2.4.1	--	--	--
			01609	00014	C.2.3.3	--	--	--
			01609	00015	C.2.4.1	--	--	--
			01609	00016	C.2.5.1	--	--	--
			01609	00018	C.2.7	--	--	--
			01609	00019	C.2.8.3	--	--	--
			01609	00025	C.2.3.2	--	--	--
			01609	00031	C.2.8.2	--	--	--
			01609	00032	C.2.4.1	--	--	--
	Jones, Jayson R.		00970	00001	C.2.1.1	--	--	--
			00970	00002	C.3.4.4	--	--	--
			00970	00003	C.3.4.4	--	--	--
			00970	00004	C.3.4.4	--	--	--
	Jones, Henry		00999	00001	C.3.4.4	--	--	--
	Jones, Dorothy		01014	00001	C.2.7	--	--	--
	Jones, Frank		01016	00001	C.2.7	--	--	--
			01016	00008	C.2.1.5	--	--	--
	Jones, Doris		01628	00001	C.3.4.4	--	--	--
	Jones, Dorothy		01650	00001	C.2.7	--	--	--
	Jones, Cecil E.		01771	00001	C.3.4.4	--	--	--
	Jones, JoAnn		01832	00001	C.3.4.4	--	--	--
	Jones, Henry	Richton Elementary School	01216	00001	C.3.4.4	--	--	--
	Jones, Henry		01635	00001	C.3.1.2	--	--	--
	Kallery, Mrs. Easton		01992	00001	C.3.4.4	--	--	--
	Kanady/Shulman, Cathy/Ruth	MS Chapter Sierra Club	01663	00001	C.3.4.4	--	--	--

C.9-66

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Mississippi (continued)</u>								
			01663	00002	C.2.3.3	--	--	--
			01663	00003	C.3.1.2	--	--	--
	Kay, Patty		02028	00001	C.3.4.4	--	--	--
	Kay, Jonathan		02029	00001	C.3.4.4	--	--	--
	Keating, Angela		02035	00001	C.3.4.4	--	--	--
	Keenerly, Amanda		00953	00001	C.3.1.2	--	--	--
			00953	00002	C.3.1.2	--	--	--
	Keller, D. L.	Batelle, Project Mgmt. Division	01720	00001	C.2.8.2	--	--	--
	Keller, D. L.		01735	00001	C.2.8.2	--	--	--
	Kennedy, Cynthia		00941	00001A	C.3.1.2	--	--	--
			00941	00001C	C.2.3.1	--	--	--
		CAND	01676	00001	C.3.4.4	--	--	--
	Kennedy, Cynthia		01709	00001	C.2.8.2	--	--	--
	Kennedy, Cynthia		01710	00001	C.2.8.2	--	--	--
	Keenedy, Cynthia		01711	00001	C.2.8.2	--	--	--
	Kennerly, Amanda		01662	00001	C.3.1.2	--	--	--
			01662	00002	C.3.1.2	--	--	--
			01662	00003	C.3.1.2	--	--	--
			01662	00004	C.3.4.4	--	--	--
	Kerley, W. Joseph		00292	00001	C.3.4.4	--	--	--
	Knight, Rose H.		01769	00001	C.3.4.4	--	--	--
	Knight, Marion C.		02055	00001	C.3.4.4	--	--	--
	Kohaneck, Harriet K.		01670	00001	C.3.4.4	--	--	--
	Kosbab, Dick	Hancock Cty. Chamber of Commerce	01704	00001	C.3.4.4	--	--	--
	Kostmayer, Lillian		01929	00001	C.3.4.4	--	--	--
	Kostmayer, Shaun L.		01932	00001	C.2.8.2	--	--	--
	Kostmayer, R. Lee		02046	00001	C.3.1.2	--	--	--
	Kostmayer, Jr., Robert Lee		01931	00001	C.2.6	--	--	--
	Kriuanec, Mr. & Mrs. Joey		01770	00001	C.3.4.4	--	--	--
	LaGrone, Tonette		00946	00001	C.3.4.4	--	--	--
			00946	00002	C.3.4.4	--	--	--
	LaGrone, Don		00947	00001	C.3.1.2	--	--	--
			00947	00002	C.7.3	--	--	--
			00947	00005	C.2.4.1	--	--	--
			00947	00006	C.2.5.2	--	--	--
			00947	00007	C.2.4.1	--	--	--
			00947	00008	C.3.4.4	--	--	--

C.9-67

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Landry, Sarah	Oak Park Garden Club	00947	00009	C.3.4.4	--	--	--
	Lang, Mrs. Charles V.		01871	00001	C.3.4.4	--	--	--
	Latimer, Mel		01669	00001	C.3.4.4	--	--	--
			00963	00001	C.3.4.4	--	--	--
			00963	00002	C.3.4.4	--	--	--
			00963	00004	C.3.4.4	--	--	--
	Lawler, Mrs. Sibyl R.		02009	00001	C.3.4.4	--	--	--
	Lemon, Fred		00978	00001	C.3.4.4	--	--	--
			00978	00002	C.3.1.2	--	--	--
			00978	00005	C.3.4.4	--	--	--
		00978	00006	C.3.1.2	--	--	--	
		00978	00007	C.3.4.4	--	--	--	
	Leslie, Robert C.	01979	00001	C.3.4.4	--	--	--	
	Lesso, Fay	00956	00001	C.3.4.4	--	--	--	
		00956	00002	C.3.4.4	--	--	--	
	Litchfield, Kathy	00169	00001	C.2.8.1	--	--	--	
		00169	00002	C.3.4.4	--	--	--	
	Litchfield, Norman	00959	00001	C.3.4.4	--	--	--	
		00959	00002	C.3.4.4	--	--	--	
		00959	00003	C.3.4.4	--	--	--	
	Lloyd, Eva	01917	00001	C.3.4.4	--	--	--	
	Lofton, Mary Cruso	01767	00001	C.3.4.4	--	--	--	
	Loftus, Jeff	01656	00001	C.3.1.2	--	--	--	
	Loftus, John B.	01837	00001	C.3.4.4	--	--	--	
	Logan, Mrs. S. J.	02017	00001	C.3.1.2	--	--	--	
	Longino, Lewis	01939	00001	C.3.4.4	--	--	--	
	Lyman, India	01005	00001	C.3.4.4	--	--	--	
	Lyman, India	01645	00001	C.3.4.4	--	--	--	
	Mallgy, Betty W.	01948	00001	C.3.4.4	--	--	--	
	Mann, Carol	01033	00001	C.2.7	--	--	--	
		01033	00005	C.2.2	--	--	--	
		01033	00006	C.2.4.1	--	--	--	
		01033	00008	C.2.8.3	--	--	--	
		01033	00009	C.2.7	--	--	--	
		01033	00010	C.3.4.4	--	--	--	
	Mann, Carol	01608	00005	C.2.7	--	--	--	
		01608	00006	C.2.4.1	--	--	--	
		01608	00008	C.2.8.3	--	--	--	

C.9-68

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
			01608	00009A	C.2.7	--	--	--
			01608	00009B	C.2.7	--	--	--
			01608	00009C	C.2.3.1	--	--	--
			01608	00009D	C.2.1.1	--	--	--
			01608	00009E	C.2.1.1	--	--	--
			01608	00009F	C.2.1.1	--	--	--
			01608	00009G	C.2.1.1	--	--	--
			01608	00009H	C.2.1.1	--	--	--
			01608	00010	C.3.4.4	--	--	--
	Marie, Connie	City of Biloxi	01698	00001	C.3.4.4	--	--	--
	Marino, Frank	Cong. Lungren Office	01746	00001	C.2.8.2	--	--	--
	Masters, David and Carolyn N.		02706	00001	C.3.4.4	--	--	--
			02706	00002	C.3.4.4	--	--	--
			02706	00003	C.3.1.2	--	--	--
	Matturi, Judy C.		01846	00001	C.3.4.4	--	--	--
	Mayfield, Frances		01784	00001	C.3.1.2	--	--	--
	McCall, Dennis Alan		01843	00001	C.3.1.2	--	--	--
	McCall, Kathy Smith		01993	00001	C.3.4.4	--	--	--
	McCandliss, Robert K.		01928	00001	C.3.4.4	--	--	--
	McCaskill, Mallory	Richton Elementary School	01213	00001	C.3.4.4	--	--	--
	McCaudliss, Virginia G.		01930	00001	C.3.4.4	--	--	--
	McCormick, David O.	Jackson Cty Young Lawyers Assn.	01689	00001	C.3.4.4	--	--	--
	McIlwain, Lana		01010	00001	C.3.4.4	--	--	--
			01010	00002	C.3.1.2	--	--	--
	McIlwain, Lana B.	Richton Woman's Club, Inc.	01648	00001	C.3.4.4	--	--	--
			01648	00002	C.3.1.2	--	--	--
			01648	00003	C.3.1.2	--	--	--
			01648	00004	C.3.1.2	--	--	--
			01648	00005	C.3.1.2	--	--	--
	McLarty, Margaret P.		01612	00001	C.3.4.4	--	--	--
			01612	00002	C.2.4.1	--	--	--
	McLarty, William		01625	00001	C.3.4.4	--	--	--
			01625	00002	C.2.4.1	--	--	--
	McRae, Debi		01845	00001	C.3.1.2	--	--	--
	Meek, Gary		02049	00001	C.3.4.4	--	--	--
	Meyer, Jr., William H.		01921	00001	C.3.4.4	--	--	--
	Miller, Glenn		01895	00001	C.3.4.4	--	--	--
	Misko, Marilyn, Jason & Senta		01826	00001	C.3.4.4	--	--	--

C.9-69

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Misko, Jr., Joseph R.		01825	00001	C.3.4.4	--	--	--
	Moore, Cynthia K.		00188	00001	C.3.4.4	--	--	--
	Moore, Mr. & Mrs. George E.		00189	00001	C.3.4.4	--	--	--
	Moore, Cherri J.		00209	00001	C.3.4.4	--	--	--
	Moore, David		00961	00001A	C.3.4.4	--	--	--
			00961	00001B	C.2.3.2	--	--	--
			00961	00002	C.2.3.2	--	--	--
			00961	00003	C.3.4.4	--	--	--
	Moore, Michael C.	DA-Jackson and Greene County	01672	00001	C.3.4.4	--	--	--
	Moran, Dan	Central Point & Supply Inc.	02032	00001	C.3.1.2	--	--	--
	Morgan, Wanda, Debra & Brenda		00122	00001	C.3.4.4	--	--	--
			00122	00002	C.2.8.1	--	--	--
			00122	00006	C.2.4.1	--	--	--
			00122	00007	C.3.1.2	--	--	--
			00122	00009B	C.3.4.4	--	--	--
	Morgan, Wanda		01002	00002	C.2.1	--	--	--
			01002	00003	C.2.8	--	--	--
			01002	00004	C.3.1.2	--	--	--
	Morgan, Wanda		01643	00002	C.2.1	--	--	--
			01643	00003	C.2.5.2	--	--	--
			01643	00004	C.3.1.2	--	--	--
	Morris, Barbara		01866	00001	C.3.1.2	--	--	--
	Morris, C. A.		01950	00001	C.3.1.2	--	--	--
	Morris, Jr., Daniel L.		01955	00001	C.3.4.4	--	--	--
	Mowery, Heidi A.		01971	00001	C.2.8.1	--	--	--
	Murphy, Diana		01864	00001	C.3.1.2	--	--	--
	Nercaise, Serinie		01969	00001	C.3.4.4	--	--	--
	Netherland, Linda J.		01773	00001	C.3.4.4	--	--	--
	Netherland, Rev. Dan		01775	00001	C.3.4.4	--	--	--
	Netherland, Chad		01776	00001	C.3.4.4	--	--	--
	Netherland, Heidi L.		01779	00001	C.3.4.4	--	--	--
	Newell, Penny	Richton Elementary School	01208	00001	C.3.4.4	--	--	--
	Niblick, B.		01896	00001	C.3.1.2	--	--	--
	Noble, Mary W.		01918	00001	C.3.4.4	--	--	--
	Nuwer, David And Deanne		01983	00001	C.3.1.2	--	--	--
	O'Brien, Mrs. Vivan		02042	00001	C.3.4.4	--	--	--
	O'Keefe, John		00948	00001	C.3.4.4	--	--	--
			00948	00003	C.3.1.2	--	--	--

C.9-70

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Odle, Jr., Robert C.	Intergovernmental & Public Aff.	00948	00004	C.3.4.4	--	--	--
	Oehler, James A.		01739	00001	C.2.8.2	--	--	--
	O'iver, James		01827	00001	C.3.4.4	--	--	--
			00984	00001	C.2.6.2	--	--	--
			00984	00002	C.3.1.2	--	--	--
	Olson, Mrs. A.		00984	00004	C.3.1.2	--	--	--
	Osgood, J. Isaac		01772	00001	C.3.1.2	--	--	--
	Overstreet, Peggy & Kenneth		01882	00001	C.3.4.4	--	--	--
	Pagano, Dottie G.		02021	00001	C.3.4.4	--	--	--
			02012	00001	C.3.4.4	--	--	--
			02012	00002	C.2.8.1	--	--	--
	Parker, Althea		01972	00001	C.3.4.4	--	--	--
	Parkman, Paula W.		01849	00001	C.3.4.4	--	--	--
	Pate, Mrs. William H.	Friends of Gulfport-Harrison	01687	00001	C.3.4.4	--	--	--
	Patterson, Burt L.	Ocean Springs Cham. of Commerce	01695	00001	C.3.4.4	--	--	--
	Paulk, Angela	Richton Elementary School	01209	00001	C.3.4.4	--	--	--
	Peroyea, Suzanne		02033	00001	C.3.1.2	--	--	--
	Peters, T. N.		01610	00001	C.3.4.4	--	--	--
	Peters, Esther T.		01626	00001	C.3.4.4	--	--	--
	Peterson, Anne	City of Gulfport	01688	00001	C.3.4.4	--	--	--
	Pickett, Jack & Jane		01990	00001	C.3.4.4	--	--	--
			01990	00002	C.2.8.1	--	--	--
	Pittman, Atty. Genl, Edwin Lloyd	State of Mississippi	01369	00001	C.2.1.1	--	--	--
			01369	00002	C.2.1.1	--	--	--
			01369	00003	C.2.1.1	--	--	--
			01369	00004	C.2.7	--	--	--
			01369	00005	C.2.1.2	--	--	--
			01369	00006	C.2.1.1	--	--	--
			01369	00008	C.3.1.1	--	--	--
			01369	00009	C.2.2	--	--	--
			01369	00011	C.3.3	--	--	--
			01369	00013	C.7.1.1.2	C.7.1.1.6	C.4.2.3	C.2.7
			01369	00014	C.2.1.2	--	--	--
			01369	00015	C.3.4.3	--	--	--
			01369	00017	C.2.1.2	--	--	--
			01369	00018	C.2.7	--	--	--
			01369	00023	C.3.4.1	--	--	--

C.9-71

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Mississippi</u> (continued)								
			01369	00024	C.3.4.2.2	--	--	--
			01369	00040	C.3.4.4	--	--	--
			01369	00041	C.3.4	--	--	--
			01369	00042	C.2.4.1	--	--	--
			01369	00043	C.2.1.1	--	--	--
			01369	00044	C.2.1.2	--	--	--
			01369	00045	C.2.1.2	--	--	--
			01369	00046	C.2.2	--	--	--
			01369	00047	C.3.4.4	--	--	--
	Pontius, Dr. William		00971	00001	C.3.4.4	--	--	--
	Porter, Michael		01830	00001	C.3.4.4	--	--	--
	Porter, Robert L.		02050	00001	C.2.8.2	--	--	--
	Powell, Syble S.		01791	00001	C.3.4.4	--	--	--
	Powell, Benjamin F.		01792	00001	C.3.4.4	--	--	--
	Powell, Stephen F.		01794	00001	C.3.4.4	--	--	--
	Powers, Sue		00980	00001	C.3.4.4	--	--	--
			00980	00002	C.3.4.4	--	--	--
	Powers, George E.		01848	00001	C.3.4.4	--	--	--
	Prather, Thelma & Virgil		02031	00001	C.3.1.2	--	--	--
	Puckett, Claudette		00985	00001	C.3.4.3	--	--	--
			00985	00002	C.3.1.2	--	--	--
	Purdy, Susan		01034	00001	C.2.1.1	--	--	--
			01034	00002	C.2.7	--	--	--
			01034	00008	C.3.1.1	--	--	--
			01034	00009	C.3.1.2	--	--	--
	Quigley, Claudette M.		02008	00001	C.3.4.4	--	--	--
	Rahaim, Mayor Ron		00988	00001	C.3.4.4	--	--	--
			00988	00002	C.3.1.2	--	--	--
			00988	00005	C.2.1.1	--	--	--
			00988	00007	C.2.3.3	--	--	--
			00988	00007B	C.2.3.1	--	--	--
			00988	00008	C.3.4.4	--	--	--
	Rahaim, Mayor Ron	Town of Richton	01639	00001	C.3.4.4	--	--	--
			01639	00002	C.3.1.2	--	--	--
			01639	00005	C.2.1.1	--	--	--
			01639	00007A	C.2.3.1	--	--	--
			01639	00007B	C.2.3.1	--	--	--

C.9-72

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Rammell, Ellen		01639	00008	C.3.4.4	--	--	--
	Rammell, James D.		01914	00001	C.3.4.4	--	--	--
	Ramsey, Byron L.		01916	00001	C.3.4.4	--	--	--
	Ramsey, Sibly S.		01994	00001	C.3.1.2	--	--	--
	Randall, Jack		02007	00001	C.3.4.4	--	--	--
	Rasmussen, Bill		01877	00001	C.3.1.2	--	--	--
	Rhodeman, Mrs. Clare Marino		01807	00001	C.3.1.2	--	--	--
	Riccardi, S.		01821	00001	C.3.4.4	--	--	--
			01666	00001	C.3.1.2	--	--	--
			01666	00002A	C.2.3.2	--	--	--
			01666	00002B	C.3.1.2	--	--	--
	Rich, Kenneth		01008	00001	C.3.4.4	--	--	--
			01008	00002	C.3.4.3	--	--	--
			01008	00003	C.3.4.4	--	--	--
			01008	00004	C.3.4.4	--	--	--
			01008	00005	C.3.1.2	--	--	--
			01008	00006	C.3.4.4	--	--	--
			01008	00008	C.2.7	--	--	--
			01008	00011	C.2.7	--	--	--
			01008	00013	C.2.7	--	--	--
			01008	00014	C.2.1.1	--	--	--
	Rich, Kenneth Edward		01646	00001	C.3.4.4	--	--	--
			01646	00002	C.3.1.2	--	--	--
			01646	00003	C.3.1.2	--	--	--
			01646	00004	C.3.4.4	--	--	--
			01646	00009	C.2.7	--	--	--
	Richard, Everett C.		02027	00001	C.3.1.2	--	--	--
	Richardson, Margaret		02011	00001	C.3.4.4	--	--	--
	Roberts, Lloyd E.	City of Moss Point	01696	00001	C.3.4.4	--	--	--
			01696	00002	C.3.4.4	--	--	--
	Robertson, William R.		01841	00001	C.3.4.4	--	--	--
	Robinson, Lillian		01860	00001	C.3.4.4	--	--	--
	Roch, Jules C.		01901	00001	C.3.1.2	--	--	--
	Rogers, Bobby		00974	00001	C.3.4.4	--	--	--
	Rogers, Joe		00975	00001	C.3.4.4	--	--	--
			00975	00002	C.3.1.2	--	--	--
			00975	00004	C.3.1.2	--	--	--
	Rogers, Dorothy		02022	00001	C.3.4.4	--	--	--

C.9-73

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Mississippi (continued)</u>								
	Rose, Navalou Dunaway		00968	00001	C.3.1.2	--	--	--
	Rosenblatt and Mills, Sen.	MS Legislature	01659	00001	C.2.8.2	--	--	--
	Rubbin, M.		01642	00001	C.3.4.4	--	--	--
	Ruddiman, Mary		01815	00001	C.3.4.4	--	--	--
			01815	00002	C.3.4.4	--	--	--
	Ruffin, Macy		01001	00001	C.3.4.4	--	--	--
	Ruffin, Lou		01018	00001	C.2.1.1	--	--	--
			01018	00008	C.2.1.5	C.2.7	--	--
	Ruffin, Mary	Richton Elementary School.	01215	00001	C.3.4.4	--	--	--
	Sangrouber, Ruby		02004	00001	C.3.4.4	--	--	--
	Satchfield, Charles		01903	00001	C.3.8	--	--	--
	Scarborough, B. R.		02034	00001	C.3.4.4	--	--	--
	Schmidt/Chance, Richard C./J.Michael		01701	00001	C.3.4.4	--	--	--
	Schroeder, Jewel		01978	00001	C.3.4.4	--	--	--
	Schwartzman, Nina		00952	00001	C.3.4.4	--	--	--
			00952	00005	C.2.8.1	--	--	--
	Schwartzman, Nina M.	MS Restaurant Assn.	01664	00001	C.3.4.4	--	--	--
			01664	00003	C.2.8.2	--	--	--
			01664	00004	C.2.8.1	--	--	--
	Sellers, Mary C.		00997	00022A	C.4.1	C.2.8.2	--	--
			00997	00022B	C.2.3	C.4.1	--	--
	Sellers, E. Clyde		01007	00001	C.2.1.1	--	--	--
			01007	00002	C.2.3.2	--	--	--
			01007	00010	C.2.1.1	--	--	--
			01007	00011	C.2.1.1	--	--	--
			01007	00012	C.3.4.4	--	--	--
	Sellers, E. Clyde		01631	00001	C.2.1.1	--	--	--
			01631	00009	C.2.1.5	--	--	--
			01631	00010	C.2.1.1	--	--	--
			01631	00011	C.2.1.1	--	--	--
	Semski, Lawrence P.		01960	00001	C.3.4.4	--	--	--
	Shankland, Nora		01873	00001	C.3.4.4	--	--	--
	Shanks, Sandra		01875	00001	C.3.4.4	--	--	--
	Shea, Mildred E.		01981	00001	C.3.4.4	--	--	--
	Shea, Thomas W.		01995	00001	C.3.4.4	--	--	--
	Sherrell, Eunice		02010	00001	C.3.4.4	--	--	--
	Shipp, H. P.		01788	00001	C.2.8.1	--	--	--
	Shrader, Jr., Frank D.		01822	00001	C.3.1.2	--	--	--

C.9-7a

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Simmons, Robert E.		01781	00001	C.3.4.4	--	--	--
	Sims, Tom	Attorney and Counselor at Law	01734	00001	C.2.8.2	--	--	--
	Smith, Felicia		01096	00001	C.3.4.4	--	--	--
			01096	00002A	C.2.4.1	--	--	--
	Smith, Suzanne		01611	00001	C.3.4.3	--	--	--
	Smith, Estelle		01938	00001	C.3.4.4	--	--	--
	Smith, James		01954	00001	C.3.4.4	--	--	--
	Snider, Ken		01803	00001	C.2.8.2	--	--	--
	Snider, Margaret S.		01804	00001	C.2.8.1	--	--	--
	Snyder, Chris		00940	00001	C.3.4.4	--	--	--
			00940	00002	C.3.1.2	--	--	--
			00940	00003	C.3.4.4	--	--	--
	Snyder, Susan		00955	00001	C.3.4.4	--	--	--
	Sohnier, Carrol J.		02039	00001	C.3.4.4	--	--	--
	Sonnier, Lelia		02038	00001	C.3.4.4	--	--	--
	Spence, Laura		01758	00001	C.3.4.4	--	--	--
	Spencer, Johnnie W.		00167	00001	C.2.1.1	--	--	--
			00167	00002	C.2.8.1	--	--	--
			00167	00003	C.3.1.2	--	--	--
			00167	00004	C.3.1.2	--	--	--
			00167	00005	C.3.1.2	--	--	--
	Spinks, Phillip		02005	00001	C.3.4.4	--	--	--
	Spinks, Patricia A.		02006	00001	C.3.4.4	--	--	--
	Spooner, Larry		02030	00001	C.3.4.4	--	--	--
	Stallworth, Bill		00936	00002	C.3.4.4	--	--	--
	Stanley, Mrs. Nora		01763	00001	C.3.4.4	--	--	--
			01763	00002	C.2.8.2	--	--	--
	Steele, Janie		01924	00001	C.7.4.1	--	--	--
	Stet, Christy		01768	00001	C.3.4.4	--	--	--
	Stevens, Henry		01009	00002	C.2.2.1	--	--	--
			01009	00003	C.2.7	--	--	--
			01009	00005	C.2.6	--	--	--
			01009	00006	C.2.2	--	--	--
	Stevens, Henry	B. M. Stevens Company	01647	00002	C.3.1.1	--	--	--
			01647	00003	C.3.1.2	--	--	--
			01647	00005	C.2.6	--	--	--
	Stokes, Mary and Jack		01909	00001	C.3.4.4	--	--	--
	Stokes, Mark		01911	00001	C.3.4.4	--	--	--

C.9-75

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Stokes, Tina		01913	00001	C.3.4.4	--	--	--
	Strader, Maria F.		01991	00001	C.3.1.2	--	--	--
	Strickland, Becky		00994	00001	C.3.4.4	--	--	--
			00994	00004	C.3.4.4	--	--	--
	Strickland, Warren		01006	00001	C.2.1.1	--	--	--
	Strickland, Adrian		01011	00001	C.3.1.2	--	--	--
	Strickland, Barry		01012	00001	C.3.4.4	--	--	--
	Strickland, Becky	Richland Home and Garden Club	01638	00001	C.3.4.4	--	--	--
	Strickland, Adrian	Richton Elementary School	01217	00001	C.3.4.4	--	--	--
	Strickland, Barry	Richton High School	01632	00001	C.3.4.4	--	--	--
	Strickland, Adrian		01633	00001	C.1	--	--	--
			01634	00001	C.2.1.1	--	--	--
			01634	00003	C.3.1.2	--	--	--
	Strong, Lon	Commission on Wildlife Conserv.	01682	00001	C.3.4.4	--	--	--
	Stuart, Jimmie D.		01958	00001	C.3.4.4	--	--	--
	Stuart, Dorothy		01967	00001	C.3.4.4	--	--	--
	Sundeen, Dr. Dan	University of So. Mississippi	01717	00001	C.2.8.2	--	--	--
	Sutton, Amy		00967	00001	C.3.4.4	--	--	--
	Tait, Mr. & Mrs. William		01889	00001	C.3.4.4	--	--	--
	Talbot, Jill		01766	00001	C.3.4.4	--	--	--
	Tanner, Mr. & Mrs. Lettman		01933	00001	C.3.1.2	--	--	--
	Taylor, Senator Gene		00958	00001	C.3.4.4	--	--	--
	Taylor, Ellis		00965	00001	C.3.4.4	--	--	--
			00965	00002	C.3.4.4	--	--	--
	Taylor, Ellis	Fifth Congressional District	01685	00001	C.3.4.4	--	--	--
			01685	00002	C.3.4.4	--	--	--
	Teck, William		00943	00001	C.3.1.2	--	--	--
			00943	00002	C.3.1.2	--	--	--
			00943	00003	C.3.4.4	--	--	--
	Thibault, Kelly		01966	00001	C.3.4.4	--	--	--
	Thompson, Russell.		00976	00001	C.3.4.4	--	--	--
			00976	00002	C.3.4.4	--	--	--
			00976	00003	C.3.1.2	--	--	--
	Thompson, Russell D.	Ocean Springs Cham. of Commerce	01694	00001	C.3.4.4	--	--	--
	Tillingshast, Nellie		00951	00001	C.3.4.4	--	--	--
			00951	00002	C.2.3.3	--	--	--
			00951	00003	C.3.1.2	--	--	--

C.9-76

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Mississippi (continued)								
	Titler, Helen		01793	00001	C.3.4.4	--	--	--
	Todaro, Antonia C.		02044	00001	C.3.4.4	--	--	--
	Todaro, Sr., Guy S.		02045	00001	C.3.4.4	--	--	--
	Tracy, Mrs. John		01629	00001	C.3.4.4	--	--	--
	Tracy, Shawn		01630	00001	C.3.4.4	--	--	--
	Trahan, Jennifer		00966	00001	C.3.4.4	--	--	--
	Umbdenstock, Mrs. P. J.		02014	00001	C.3.4.4	--	--	--
	Umbdenstock, Jr., P. J.		02013	00001	C.3.4.4	--	--	--
	Valerine, Mrs. V. H.		01996	00001	C.3.1.2	--	--	--
	Vickers, Mary A.		01756	00001	C.3.4.4	--	--	--
	Vorhes, Donna C.		01853	00001	C.2.8.1	--	--	--
			01853	00002	C.2.8.2	--	--	--
	Vorhes, Paul & Donna		01854	00001	C.3.4.4	--	--	--
	Wadley, William T.		02043	00001	C.3.4.4	--	--	--
	Wahlers, Salissa Ruth		01759	00001	C.3.1.2	--	--	--
	Wahlers, Kenmez		01980	00001	C.3.4.4	--	--	--
	Walley, Pettis		01743	00001	C.2.8.2	--	--	--
	Walley, Oren	Richton Rotary Club	01649	00001A	C.2.3.2	--	--	--
			01649	00001B	C.2.3.2	--	--	--
	Walters, Fred		00944	00001	C.2.1.1	--	--	--
			00944	00002	C.3.1.2	--	--	--
			00944	00003	C.3.1.2	--	--	--
			00944	00004	C.3.1.2	--	--	--
	Walters, Joe		00950	00001	C.3.4.4	--	--	--
			00950	00002	C.2.3.1	--	--	--
			00950	00003	C.3.4.4	--	--	--
	Walton, Ronnie L.	Pat Harrison Waterway District	01700	00001	C.3.4.4	--	--	--
	Ware, Fred		01935	00001	C.3.4.4	--	--	--
	Watson, Leon R.		01867	00001	C.3.4.4	--	--	--
	Watson, Clara A.		01870	00001	C.3.4.4	--	--	--
	Watson, Ruth A.		01934	00001	C.3.1.2	--	--	--
	Watson, Angela		01985	00001	C.3.4.4	--	--	--
	Weatherly, Mrs. Patricia C.		02056	00001	C.3.4.4	--	--	--
	Welch, Mr. Mark		01881	00001	C.3.4.4	--	--	--
	Wells, Maudie H.		01957	00001	C.3.1.2	--	--	--
	Wentzell, Boby R.		01923	00001B	C.3.4.4	--	--	--
	White, John D.		01015	00001	C.2.1	--	--	--
			01015	00002	C.2.1	C.6.2	C.2.3.1	--

C.9-77

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Mississippi (continued)</u>								
	White, John B.		01015	00004	C.3.4.4	--	--	--
			01651	00001	C.2.1	--	--	--
			01651	00002	C.2.1	--	--	--
			01651	00003	C.2.1.1	--	--	--
	Wilburn, William		02057	00001	C.3.4.4	--	--	--
	Wilkerson, Bill		01719	00001	C.2.8.2	--	--	--
	Wilkerson, Bill	Mississippi House of Reps.	01725	00001	C.2.8.2	--	--	--
	Wilkerson, Bill	State of Mississippi	01731	00001	C.2.8.2	--	--	--
	Wilkinson, Charles		01025	00001	C.2.4.1	--	--	--
			01025	00002	C.2.1.1	--	--	--
	Wilkinson, Charles	Emerg. Management/Cty of Jackson	01602	00002	C.2.1.1	--	--	--
	Williams, Peggy		01813	00001	C.3.4.4	--	--	--
	Williams, Marlane H.		01836	00001	C.3.4.4	--	--	--
	Williams, Wanda		01850	00001	C.3.4.4	--	--	--
	Williams, Jesse		01851	00001	C.3.4.4	--	--	--
	Williams, John C.		01989	00001A	C.2.5.2	--	--	--
			01989	00001B	C.3.4.4	--	--	--
			01989	00002	C.2.8.2	--	--	--
	Williams, Nellie		02040	00001	C.3.4.4	--	--	--
	Williamson, Victor H.		01952	00001	C.3.4.4	--	--	--
	Wilson, L. A.		01021	00002	C.3.1.2	--	--	--
			01021	00003	C.3.4.4	--	--	--
			01021	00004	C.2.1.5	--	--	--
			01021	00005	C.2.1.1	--	--	--
			01021	00006	C.2.8.2	--	--	--
	Wilson, Gail		01912	00001	C.3.4.4	--	--	--
	Wilson, Denise J.		01945	00001	C.3.4.4	--	--	--
	Wilson, L. A.	The Richton Dispatch	01652	00001	C.3.1.2	--	--	--
			01652	00002	C.2.1.1	--	--	--
	Wise, Catherine	Richton Elementary School	01211	00001	C.3.1.2	--	--	--
	York, David & Sue		01910	00001	C.3.4.4	--	--	--
	Zimmerman, Mavin D.		02053	00001	C.3.4.4	--	--	--
	Zimmerman, Virginia		02054	00001	C.3.4.4	--	--	--
<u>Missouri</u>								
	Keebler, James H.		00300	00001	C.2.1.1	--	--	--
			00300	00002	C.2.1.1	--	--	--

C.9-78

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Missouri (continued)								
			00300	00003	C.6.4	--	--	--
			00300	00006	C.2.7	--	--	--
	Moore, James Douglas		00030	00001	C.3.4.4	--	--	--
	Orr, Richard A.		00642	00001	C.3.4.4	--	--	--
			00642	00002	C.2.3.3	--	--	--
Montana								
	Anonymous	Coalition for Canyon Preserv.	00070	00001	C.3.4.4	--	--	--
	Hetrick, Amy L.		00612	00001	C.3.1.2	--	--	--
			00612	00003	C.3.1.2	--	--	--
	Kay, Charles		00165	00001	C.3.4.4	--	--	--
			00165	00003	C.3.4.4	--	--	--
	Miller-Richardson, Gail		00216	00001	C.3.4.4	--	--	--
			00216	00005	C.3.4.4	--	--	--
	Schunk, George		02250	00001	C.3.4.4	--	--	--
	Shaw, Dr. William S.		00308	00003	C.3.1.2	--	--	--
	Taylor, Kelli J.		00520	00001	C.3.4.4	--	--	--
Nebraska								
	Hahn, Kandra	State of Nebraska/Energy Office	02695	00001	C.2.4.1	--	--	--
			02695	00002	C.2.4.1	--	--	--
			02695	00003	C.2.4.1	--	--	--
			02695	00004	C.2.4.1	--	--	--
			02695	00005	C.2.4.1	--	--	--
			02695	00006	C.2.4.1	--	--	--
			02695	00007	C.2.4.1	--	--	--
			02695	00008	C.2.4.1	--	--	--
			02695	00009	C.2.4.1	--	--	--
			02695	00010	C.2.4.1	--	--	--
			02695	00011	C.2.4.1	--	--	--
			02695	00012	C.2.4.1	--	--	--
			02695	00013	C.2.4.1	--	--	--
			02695	00014	C.2.4.1	--	--	--
			02695	00015	C.2.4.1	--	--	--
			02695	00016	C.2.4.1	--	--	--
	Kerrey, Governor Robert	State of Nebraska	01512	00001	C.7.3	--	--	--

C.9-79

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nebraska (continued)								
			01512	00002	C.7.3	--	--	--
			01512	00003	C.2.1	--	--	--
			01512	00004	C.7.3	--	--	--
			01512	00005	C.2.4.1	--	--	--
			01512	00006	C.2.4.1	--	--	--
			01512	00007	C.2.6.1	--	--	--
			01512	00008	C.2.4.1	--	--	--
			01512	00009	C.7.3	--	--	--
			01512	00010	C.2.4.1	--	--	--
			01512	00011	C.7.3	--	--	--
Nevada								
		City of Caliente, Lincoln County	02644	000008	C.7.3	--	--	--
			02644	00001	C.7.4.2	--	--	--
			02644	00002	C.7.4	--	--	--
			02644	00003	C.2.2.1	--	--	--
			02644	00004	C.7.4.3	--	--	--
			02644	00006	C.7.3	--	--	--
			02644	00007	C.7.3	--	--	--
			02644	00008	C.7.3	--	--	--
			02644	00009	C.7.4	--	--	--
			02644	00010	C.7.4	--	--	--
			02644	00011	C.3.7	--	--	--
			02644	00012	C.2.1.1	--	--	--
			02644	00013	C.2.1.1	--	--	--
			02644	00014	C.4.1.3.1	--	--	--
			02644	00015	C.4.1.3.1	--	--	--
			02644	00016	C.4.1.3.1	--	--	--
			02644	00017	C.4.1.5	--	--	--
			02644	00018	C.4.1.5	--	--	--
			02644	00019	C.4.1.3.1	--	--	--
			02644	00020	C.4.1.4	--	--	--
			02644	00021	C.4.1.5	--	--	--
			02644	00022	C.4.1.4	--	--	--
			02644	00023	C.7.4.4	--	--	--
			02644	00024	C.7.3	--	--	--
			02644	00025	C.2.4.1	C.7.3	--	--

C.9-80

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			02644	00026	C.4.1.5	--	--	--
			02644	00027	C.4.2.1	--	--	--
			02644	00028	C.7.1.2	--	--	--
			02644	00029	C.7.1.2	--	--	--
			02644	00030	C.7.4	--	--	--
			02644	00031	C.4.3	--	--	--
			02644	00032	C.4.3	--	--	--
			02644	00033	C.7.3	--	--	--
			02644	00034	C.7.3	--	--	--
			02644	00035	C.2.4.1	--	--	--
			02644	00036	C.2.4.1	--	--	--
			02644	00037	C.7.2.3	--	--	--
			02644	00038	C.7.2.3	--	--	--
			02644	00039	C.7.3	--	--	--
			02644	00040	C.7.3	--	--	--
			02644	00041	C.7.3	--	--	--
			02644	00042	C.2.4.1	--	--	--
			02644	00043	C.2.4.1	--	--	--
			02644	00044	C.2.4.1	--	--	--
			02644	00045	C.2.4.1	--	--	--
			02644	00046	C.2.4.1	--	--	--
			02644	00047	C.7.3	--	--	--
			02644	00048	C.7.3	--	--	--
			02644	00049	C.7.3	--	--	--
			02644	00050	C.7.3	--	--	--
			02644	00051	C.2.4.1	--	--	--
			02644	00052	C.7.3	--	--	--
			02644	00053	C.7.3	--	--	--
			02644	00054	C.7.3	--	--	--
			02644	00055	C.7.3	--	--	--
			02644	00056	C.7.3	--	--	--
			02644	00057	C.7.3	--	--	--
			02644	00058	C.7.3	--	--	--
			02644	00059	C.7.4.2	--	--	--
			02644	00060	C.4.1.4	--	--	--
			02644	00061	C.7.4.2	--	--	--
			02644	00062	C.7.4.2	--	--	--
			02644	00063	C.7.4.2	--	--	--

C.9-81

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02644	00064	C.7.4.1	C.7.4.2	--	--
			02644	00065	C.7.4.5	--	--	--
			02644	00066	C.7.4.5	--	--	--
			02644	00067	C.7.4	--	--	--
			02644	00068	C.3.1.1	C.3.7	--	--
			02644	00069	C.7.3	--	--	--
			02644	00070	C.7.3	--	--	--
			02644	00072	C.7.2	--	--	--
			02644	00073	C.7.4	--	--	--
			02644	00074	C.7.4	--	--	--
			02644	00075	C.7.4	--	--	--
			02644	00076	C.7.3	--	--	--
			02644	00077	C.7.3	--	--	--
			02644	00078	C.7.3	--	--	--
			02644	00079	C.2.4.1	C.7.3	--	--
			02644	00080	C.7.3	--	--	--
			02644	00081	C.2.1.1	--	--	--
			02644	00082	C.2.1.1	--	--	--
			02644	00083	C.3.1.2	--	--	--
			02644	00084	C.3.4.3	--	--	--
			02644	00085	C.3.4.3	--	--	--
Adams, Mrs.			00424	00002	C.7.4.2	--	--	--
			00424	00003	C.7.3	--	--	--
			00424	00004	C.3.4.4	--	--	--
			00424	00005	C.3.4.4	--	--	--
Anonymous		Las Vegas City Council	01431	00001	C.3.4.4	--	--	--
			01431	00002	C.2.8	--	--	--
		NV Commission on Tourism	01426	00001	C.3.1.2	--	--	--
			01426	00002	C.3.1.2	--	--	--
		Reno City Government	01427	00001	C.3.4.4	--	--	--
			01427	00002	C.2.4.1	--	--	--
Armstrong, Gail		Lincoln County	01411	00001	C.2.4.1	--	--	--
			01411	00002	C.7.4	--	--	--
			01411	00003	C.7.4	--	--	--
			01411	00004	C.7.4.1	--	--	--
			01411	00005	C.7.3	--	--	--
			01411	00006	C.2.4.1	C.7.3	--	--
			01411	00007	C.7.4.4	--	--	--

C.9-82

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
Ballow, Thomas W.		St. of NV, Dept. of Agriculture	01411	00008	C.7.4	--	--	--
			02651	00001	C.2.4.2	--	--	--
			02651	00002	C.7.4	--	--	--
Barbano, Andrew			02651	00003	C.4.1.3.1	--	--	--
			01453	00001	C.2.1.1	--	--	--
			01453	00002	C.3.1.1	--	--	--
			01453	00003	C.2.8	--	--	--
Bass, John		Beatty Town Advisory Committee	01416	00001	C.3.1.2	--	--	--
			01416	00002	C.2.1.2	--	--	--
			01416	00003	C.2.1.2	--	--	--
			01416	00004	C.2.1.2	--	--	--
			01416	00005	C.3.4.4	C.7.4	--	--
			01416	00006	C.2.1.5	--	--	--
			01416	00007	C.3.1.2	--	--	--
Bass, John R. Bass, John		Beatty Town Advisory Council	00136	00001	C.2.1.2	--	--	--
			01402	00001	C.3.1.2	--	--	--
Baughman, Mike			01402	00002	C.2.1.2	--	--	--
			01402	00005	C.7.4	--	--	--
			01402	00006	C.7.4	--	--	--
			01402	00007	C.3.1.2	--	--	--
			01449	00001	C.2.4.1	C.7.3	--	--
			01449	00002	C.7.4	--	--	--
			01449	00003	C.7.4.3	--	--	--
			01449	00004	C.7.3	--	--	--
			01449	00005	C.7.3	--	--	--
			01449	00006	C.7.4	--	--	--
Baughman, Mike L.		Resource Concepts Inc.	01449	00007	C.2.1.1	--	--	--
			01449	00008	C.2.1.2	--	--	--
			00020	00001	C.4.1.5	--	--	--
			00020	00002	C.7.3	--	--	--
			00020	00003	C.4.1.5	--	--	--
			00020	00004	C.7.4	--	--	--
			00020	00005	C.4.1.5	--	--	--
			00020	00006	C.7.4	--	--	--
Bechtel, Dennis		Clark County Commission	01422	00002	C.3.4.4	--	--	--
			01422	00004	C.2.4.1	--	--	--
			01422	00005	C.7.3	--	--	--
			01422	00006	C.3.4.3	--	--	--

C.9-83

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			01422	00007	C.7.3	--	--	--
			01422	00008	C.2.4.1	--	--	--
			01422	00009	C.7.4.2	--	--	--
			01422	00010	C.7.4.3	--	--	--
			01422	00011	C.2.1.2	--	--	--
Bell, John W.		NV Bureau of Mines & Geology	02649	00001	C.5.7	--	--	--
			02649	00002	C.5.7	--	--	--
			02649	00003	C.5.7	--	--	--
			02649	00004	C.5.7	--	--	--
			02649	00005	C.5.7	--	--	--
			02649	00006	C.5.7	--	--	--
			02649	00007	C.5.7	--	--	--
			02649	00008	C.3.1.3	C.5.7	--	--
			02649	00009	C.3.1.3	C.5.7	--	--
			02649	00010	C.5.7	C.3.1.3	--	--
			02649	00011	C.3.1.3	C.3.1	--	--
			02649	00012	C.3.1.3	C.8.4	--	--
			02649	00013	C.3.1.3	C.8.4	--	--
			02649	00014	C.3.1.3	C.4.1.1	--	--
			02649	00015	C.3.1.3	C.4.1.1	--	--
			02649	00016	C.3.1.3	C.4.1.1	--	--
			02649	00017	C.5.1	C.3.1.1	--	--
			02649	00018	C.5.7	C.3.1.3	--	--
			02649	00019	C.5.7	--	--	--
			02649	00020	C.5.7	C.3.1.3	--	--
			02649	00021	C.5.7	--	--	--
			02649	00022	C.5.7	--	--	--
			02649	00023	C.5.7	--	--	--
			02649	00024	C.5.7	--	--	--
			02649	00025	C.5.7	--	--	--
			02649	00026	C.5.7	--	--	--
			02649	00027	C.5.7	--	--	--
			02649	00028	C.5.7	--	--	--
			02649	00029	C.5.7	--	--	--
			02649	00030	C.5.7	--	--	--
			02649	00031	C.5.7	--	--	--
			02649	00032	C.5.7	--	--	--
			02649	00033	C.5.7	--	--	--

98-60

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02649	00034	C.5.7	--	--	--
			02649	00035	C.5.7	--	--	--
			02649	00036	C.6.4	--	--	--
			02649	00095	C.5.6	--	--	--
			02649	00098	C.5.7	--	--	--
	Benedickt, Patrick		01486	00001	C.5.7	--	--	--
			01486	00002	C.2.3.2	--	--	--
			01486	00003	C.4.3	--	--	--
			01486	00004	C.7.3	--	--	--
			01486	00005	C.2.4.1	--	--	--
	Bernard, Jackie		01461	00001	C.2.4.1	C.7.3	--	--
	Bernard, M.		01462	00001	C.2.6.3	--	--	--
	Bernheimer, Mrs.		01454	00001	C.2.4.1	--	--	--
	Bird, Marian J.		00266	00001	C.7.2.2	--	--	--
			00266	00002	C.8.3	--	--	--
			00266	00003	C.7.2.2	--	--	--
			00266	00004	C.6.4	--	--	--
			00266	00005	C.5.7	--	--	--
			00266	00006	C.5.1	--	--	--
			00266	00007	C.3.1	--	--	--
			00266	00008	C.4.3	--	--	--
			00266	00009	C.4.3	--	--	--
			00266	00010	C.2.4.3	--	--	--
			00266	00011	C.2.8.2	--	--	--
	Bradbury, Audry		01420	00001	C.4.1.2.2	--	--	--
			01420	00002	C.8.3	--	--	--
			01420	00003	C.7.4.1	--	--	--
			01420	00004	C.7.4.3	--	--	--
			01420	00005	C.5.1	--	--	--
			01420	00006	C.2.1.2	--	--	--
			01420	00007	C.7.4.3	--	--	--
			01420	00008	C.6.4	--	--	--
	Bradhurst, Stephen T.	Nye County Planning Consultant	01558	00001	C.2.4.1	--	--	--
			01558	00002	C.3.1.2	--	--	--
			01558	00003	C.2.4.1	--	--	--
			01558	00004	C.4.3	--	--	--
			01558	00005	C.7.4	--	--	--
			01558	00006	C.7.4.5	--	--	--

C.9-85

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			01558	00007	C.4.1.1	--	--	--
			01558	00008	C.5.11	--	--	--
			01558	00009	C.2.4.1	C.7.3	--	--
			01558	00010	C.6.5	--	--	--
			01558	00011	C.3.1.2	--	--	--
			01558	00012	C.4.1.2.2	--	--	--
			01558	00013	C.4.1.2.2	--	--	--
			01558	00014	C.7.2.7	--	--	--
			01558	00015	C.3.1.3	--	--	--
			01558	00016	C.3.1.2	--	--	--
			01558	00017	C.3.4.3	--	--	--
			01558	00018	C.3.4.3	--	--	--
			01558	00019	C.3.1.3	--	--	--
			01558	00020	C.7.3	--	--	--
			01558	00021	C.8.3	--	--	--
			01558	00022	C.4.1.1	--	--	--
			01558	00023	C.4.1.1	--	--	--
			01558	00024	C.4.1.2.2	--	--	--
			01558	00025	C.4.1.2.3	--	--	--
			01558	00026	C.4.1.3.1	--	--	--
			01558	00027	C.4.1.3.1	--	--	--
			01558	00028	C.2.4.1	C.4.1.4	--	--
			01558	00029	C.4.1.4	--	--	--
			01558	00030	C.2.4.1	C.4.1.4	--	--
			01558	00031	C.4.1.5	--	--	--
			01558	00032	C.4.1.5.2	--	--	--
			01558	00033	C.4.1.5.1	--	--	--
			01558	00034	C.4.1.5.1	--	--	--
			01558	00035	C.4.1.5.2	--	--	--
			01558	00036	C.4.1.5	--	--	--
			01558	00037	C.4.1.5.1	--	--	--
			01558	00038	C.4.1.5.3	--	--	--
			01558	00039	C.4.1.5.3	--	--	--
			01558	00040	C.4.1.5.3	--	--	--
			01558	00041	C.4.1.5.3	--	--	--
			01558	00042	C.4.1.5.3	--	--	--
			01558	00043	C.4.1.5.3	--	--	--
			01558	00044	C.4.1.5.3	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			01558	00045	C.4.1.5.3	C.4.1.5.3	--	--
			01558	00046	C.4.1.5.3	--	--	--
			01558	00047	C.7.4	--	--	--
			01558	00048	C.4.1.5.4	--	--	--
			01558	00049	C.4.1.5.5	--	--	--
			01558	00050	C.4.2.2	--	--	--
			01558	00051	C.4.2.2	--	--	--
			01558	00052	C.4.2.1	--	--	--
			01558	00053	C.7.1.1	--	--	--
			01558	00054	C.4.2	--	--	--
			01558	00055	C.7.1.2	--	--	--
			01558	00056	C.7.1.2	--	--	--
			01558	00057	C.7.1.2	--	--	--
			01558	00058	C.7.1.2	--	--	--
			01558	00059	C.7.1.2	--	--	--
			01558	00060	C.7.1.2	--	--	--
			01558	00061	C.7.1.2	--	--	--
			01558	00062	C.4.3	--	--	--
			01558	00063	C.4.3	--	--	--
			01558	00064	C.4.3	--	--	--
			01558	00065	C.4.3	--	--	--
			01558	00066	C.4.3	--	--	--
			01558	00067	C.4.3	--	--	--
			01558	00068	C.4.3	--	--	--
			01558	00069	C.7.3	--	--	--
			01558	00070	C.7.2	--	--	--
			01558	00071	C.8.3	--	--	--
			01558	00072	C.7.2.1	--	--	--
			01558	00073	C.7.2.7	--	--	--
			01558	00074	C.7.3	--	--	--
			01558	00075	C.7.4.1	--	--	--
			01558	00076	C.7.3	--	--	--
			01558	00077	C.7.3	--	--	--
			01558	00078	C.7.3	--	--	--
			01558	00079	C.7.3	--	--	--
			01558	00080	C.2.4.1	C.7.3	--	--
			01558	00081	C.7.3	--	--	--
			01558	00082	C.2.4.1	C.7.3	--	--

G.9-87

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			01558	00083	C.7.3	--	--	--
			01558	00084	C.7.4.2	--	--	--
			01558	00085	C.7.4.2	--	--	--
			01558	00086	C.7.4	--	--	--
			01558	00087	C.7.4	--	--	--
			01558	00088	C.7.4.1	--	--	--
			01558	00089	C.7.4.3	--	--	--
			01558	00090	C.7.4.3	--	--	--
			01558	00091	C.7.4.3	--	--	--
			01558	00092	C.7.4.3	--	--	--
			01558	00093	C.5.9	C.6.4	--	--
			01558	00094	C.7.4	--	--	--
			01558	00095	C.7.4	--	--	--
			01558	00096	C.7.4	--	--	--
			01558	00097	C.7.3	--	--	--
			01558	00098	C.2.4.1	C.7.3	--	--
			01558	00099	C.7.3	--	--	--
			01558	00100	C.2.4.1	--	--	--
	Bryan, Governor Richard H.	State of Nevada	02671	00001	C.3.1.1	--	--	--
			02671	00002	C.2.3.1	--	--	--
			02671	00003	C.3.4.4	--	--	--
			02671	00004	C.3.1.2	--	--	--
			02671	00005	C.3.1.2	--	--	--
			02671	00006	C.3.1.2	--	--	--
	Bukowski, Grace		00511	00001	C.5.1	--	--	--
			00511	00002	C.6.5	--	--	--
			00511	00003	C.3.1.1	--	--	--
			00511	00004	C.7.4.2	--	--	--
			00511	00005	C.2.8.2	--	--	--
			00511	00006	C.5.9	--	--	--
			00511	00007	C.7.2	--	--	--
			00511	00008	C.3.1.2	--	--	--
			00511	00009	C.5.3	--	--	--
	Bukowski, Grace		01482	00001	C.6.1	--	--	--
			01482	00002	C.2.8.3	--	--	--
			01482	00003	C.2.5.2	--	--	--
			01482	00004	C.7.4.2	--	--	--
			01482	00005	C.2.4.2	--	--	--

C.9-88

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			01482	00006	C.5.9	--	--	--
			01482	00007	C.7.2	--	--	--
			01482	00008	C.3.1.2	--	--	--
			01482	00009	C.5.3	--	--	--
			01482	00010	C.3.1.2	--	--	--
			01482	00011	C.5.11	--	--	--
	Byrd, Mark	Sierra Club	01441	00001	C.7.3	--	--	--
			01441	00002	C.2.8.2	--	--	--
			01441	00003	C.6.4	--	--	--
			01441	00004	C.8.3	--	--	--
	Byrne, Bernard		01438	00001	C.2.4.1	C.7.3	--	--
	Carrico, Helen R. & Renee		00031	00001	C.3.4.4	--	--	--
	Christensen, Douglass		01434	00001	C.3.4.4	--	--	--
	Crockett, George	Lazy Flying C Ranch	01109	00001	C.7.4.2	--	--	--
	Curry, Harold		00513	00001	C.3.4.4	--	--	--
	Dangerfield, G.		01470	00001	C.2.8.1	--	--	--
	Dehne, Donald L.	Dept. of Comm., Div. Emer.Mgmt.	02654	00001	C.7.3	--	--	--
			02654	00002	C.7.3	--	--	--
			02654	00003	C.7.3	C.3.7	--	--
			02654	00004	C.7.3	--	--	--
			02654	00005	C.3.1.3	--	--	--
			02654	00006	C.7.3	--	--	--
			02654	00007	C.7.3	--	--	--
			02654	00008	C.7.3	--	--	--
			02654	00009	C.7.3	--	--	--
			02654	00010	C.7.3	--	--	--
			02654	00011	C.7.4.3	--	--	--
			02654	00012	C.7.4	--	--	--
			02654	00013	C.7.4	--	--	--
			02654	00014	C.7.3	--	--	--
			02654	00015	C.7.3	--	--	--
			02654	00016	C.7.3	--	--	--
			02654	00017	C.7.4.5	--	--	--
			02654	00018	C.7.4.5	--	--	--
			02654	00019	C.7.3	--	--	--
			02654	00020	C.7.3	--	--	--
			02654	00021	C.2.4.1	--	--	--
	Dickinson, Bob		01414	00001	C.2.1.1	--	--	--

C.9-89

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			01414	00002	C.2.4.1	--	--	--
			01414	00003	C.2.4.1	--	--	--
			01414	00004	C.2.3.2	--	--	--
			01414	00005	C.2.1.2	--	--	--
Dickinson, Bob			01452	00001	C.7.3	--	--	--
			01452	00002	C.5.11	--	--	--
			01452	00003	C.2.8.1	--	--	--
Dobra, John L.		Bureau Business & Economic Res.	02653	00001	C.4.1.5.5	--	--	--
			02653	00002	C.4.1.5.2	--	--	--
			02653	00003	C.4.1.5.2	--	--	--
			02653	00004	C.7.1.2	--	--	--
			02653	00006	C.7.4.2	--	--	--
			02653	00007	C.7.4.2	--	--	--
			02653	00008	C.7.4.1	--	--	--
			02653	00009	C.7.4.1	--	--	--
			02653	00011	C.7.4.1	--	--	--
			02653	00012	C.7.1.2	--	--	--
			02653	00013	C.7.1.2	--	--	--
			02653	00014	C.7.4	--	--	--
			02653	00015	C.7.4.2	--	--	--
			02653	00016	C.7.4	--	--	--
			02653	00017	C.7.4.2	--	--	--
			02653	00018	C.7.4.2	--	--	--
			02653	00019	C.7.4.2	--	--	--
			02653	00020	C.7.4.2	--	--	--
			02653	00021	C.7.4.2	--	--	--
			02653	00022	C.7.4.3	--	--	--
			02653	00023	C.7.4.3	--	--	--
			02653	00024	C.7.4.3	--	--	--
			02653	00025	C.2.1.2	--	--	--
			02653	00026	C.7.4	--	--	--
			02653	00027	C.7.4	--	--	--
			02653	00028	C.7.4	--	--	--
			02653	00029	C.7.4	--	--	--
			02653	00030	C.7.4	--	--	--
			02653	00031	C.7.4	--	--	--
			02653	00032	C.7.4	--	--	--
			02653	00033	C.7.4	--	--	--

C.9-90

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			02653	00034	C.7.4	--	--	--
			02653	00035	C.4.1.5.2	--	--	--
			02653	00036	C.4.1.5.2	--	--	--
			02653	00037	C.4.1.5.2	--	--	--
			02653	00038	C.4.1.5.2	--	--	--
			02653	00039	C.4.1.5.2	--	--	--
			02653	00040	C.4.1.5.2	--	--	--
			02653	00041	C.4.1.5.2	--	--	--
			02653	00042	C.4.1.5.2	--	--	--
			02653	00043	C.4.1.5.2	--	--	--
			02653	00044	C.2.1.3	--	--	--
	Doherty, Frank		00004	00001	C.3.1.2	--	--	--
			00004	00002	C.3.4.4	--	--	--
			00004	00003	C.3.1.2	--	--	--
			00004	00004	C.3.1.2	--	--	--
			00004	00005	C.7.3	--	--	--
	Dondero, Thalia	Board of Co. Commissioners	01230	00001	C.2.1.1	--	--	--
			01230	00002	C.3.1.2	--	--	--
			01230	00003	C.3.1.2	--	--	--
			01230	00004	C.3.1.2	--	--	--
			01230	00005	C.3.3	--	--	--
			01230	00006	C.3.3	--	--	--
			01230	00007	C.4.3	--	--	--
			01230	00008	C.3.4.3	--	--	--
			01230	00009	C.3.1.1	--	--	--
			01230	00010	C.2.4.1	--	--	--
			01230	00011	C.2.4.1	--	--	--
			01230	00012	C.7.3	--	--	--
			01230	00013	C.3.4.3	--	--	--
			01230	00014	C.2.4.1	C.7.3	--	--
			01230	00015	C.2.8.1	--	--	--
			01230	00016	C.2.4.1	--	--	--
			01230	00017	C.7.4.3	--	--	--
			01230	00018	C.7.4	--	--	--
			01230	00019	C.7.4.2	--	--	--
			01230	00020	C.7.4.2	--	--	--
			01230	00021	C.3.4.3	--	--	--
	Duncan, Jr., Roy C.		00516	00001	C.6.4	--	--	--

G-9-91

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
	Early, Ann		01097	00001	C.3.4.4	--	--	--
			01097	00002	C.7.3	--	--	--
			01097	00003	C.4.1.3.7	--	--	--
			01097	00004	C.5.11	--	--	--
			01097	00005	C.4.1.1	--	--	--
			01097	00006	C.2.8.1	C.4.1.5.1	--	--
			01097	00007	C.7.3	--	--	--
	Faryna, Ellen		01097	00008	C.2.4.1	C.7.3	--	--
			01489	00001	C.7.3	--	--	--
			01489	00002	C.5.7	--	--	--
			01489	00003	C.7.4.2	--	--	--
	Fedinic, C.		01466	00001	C.3.4.4	--	--	--
			01466	00002	C.5.1	--	--	--
	Ferraro, Mayor	Boulder City, City Council	01428	00001	C.3.4.4	--	--	--
	Fulkerson, Mr. B.		01457	00001	C.2.4.1	--	--	--
			01457	00002	C.4.1.1	--	--	--
			01457	00003	C.5.7	--	--	--
			01457	00004	C.6.4	--	--	--
			01457	00005	C.6.4	--	--	--
			01457	00006	C.5.2	--	--	--
			01457	00007	C.2.4.1	--	--	--
			01457	00008	C.7.3	--	--	--
			01457	00009	C.2.4.1	--	--	--
			01457	00010	C.7.2.1	--	--	--
			01457	00011	C.7.4.2	--	--	--
			01457	00012	C.5.8	--	--	--
			01457	00013	C.6.5	--	--	--
			01457	00014	C.6.5	--	--	--
			01457	00015	C.3.1.2	--	--	--
			01457	00016	C.3.4.3	--	--	--
			01457	00017	C.2.8.1	--	--	--
			01457	00018	C.2.1.1	--	--	--
			01457	00019	C.2.1.1	--	--	--
	Fulkerson, Bob	Citizen Alert	01262	00001	C.5.7	--	--	--
			01262	00002	C.5.7	--	--	--
			01262	00003	C.6.4	--	--	--
			01262	00004	C.5.2	--	--	--
			01262	00005	C.5.4	--	--	--

C.9-92

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			01262	00006	C.2.4.1	C.7.3	--	--
			01262	00007	C.7.3	--	--	--
			01262	00008	C.2.4.1	C.7.3	--	--
			01262	00009	C.2.4.1	C.7.3	--	--
			01262	00010	C.2.4.1	--	--	--
			01262	00011	C.7.2.1	--	--	--
			01262	00012	C.7.4.2	--	--	--
			01262	00013	C.5.8	--	--	--
			01262	00014	C.6.6	--	--	--
			01262	00015	C.7.4	--	--	--
			01262	00016	C.3.1.2	--	--	--
			01262	00017	C.2.1.1	--	--	--
	Gary, Keneth		01405	00001	C.3.4.4	--	--	--
	Gary, Jean		01406	00001	C.3.4.4	--	--	--
	Gates, David A.	Dept. of Commerce	02658	00001	C.2.4.1	--	--	--
	Gregory, T.		01459	00001	C.2.8.1	--	--	--
			01459	00002	C.3.1.2	--	--	--
			01459	00003	C.3.1.2	--	--	--
	Hale, Ms. C.		01455	00001	C.2.1.1	--	--	--
			01455	00002	C.2.7	--	--	--
			01455	00003	C.3.1.2	--	--	--
			01455	00004	C.2.8.3	--	--	--
	Hall, Robert		01412	00001	C.3.4.4	--	--	--
	Hammes, Babe		01409	00001	C.2.8.3	--	--	--
			01409	00002	C.5.7	--	--	--
	Hardy, James K.	Torok Expl., Min., & Constr. Co.	01110	00001	C.3.4.4	--	--	--
			01110	00002	C.2.1.2	--	--	--
			01110	00003	C.3.1.2	--	--	--
	Harlan, Shirley		01432	00001	C.2.4.3	--	--	--
			01432	00002	C.5.11	--	--	--
			01432	00003	C.5.11	--	--	--
			01432	00004	C.2.3.2	--	--	--
	Harlan, Shirley J.	Cold Comfort Farm	01168	00001	C.2.4.3	--	--	--
			01168	00002	C.7.2.1	--	--	--
			01168	00003	C.2.8.3	--	--	--
			01168	00004	C.2.3.2	--	--	--
	Herr, R.		01478	00001	C.7.3	--	--	--
			01478	00002	C.7.3	--	--	--

C.9-93

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
	Hill, Ronald W.	Dept. of Transportation	01478	00003	C.6.1	--	--	--
			02655	00001	C.3.1.1	--	--	--
			02655	00002	C.2.4.1	--	--	--
			02655	00003	C.2.4.1	--	--	--
			02655	00004	C.2.4.1	--	--	--
			02655	00005	C.2.4.1	--	--	--
			02655	00006	C.2.4.1	--	--	--
			02655	00007	C.2.4.1	--	--	--
			02655	00007A	C.7.3	--	--	--
			02655	00007B	C.7.3	--	--	--
			02655	00008	C.7.3	--	--	--
			02655	00009	C.7.3	--	--	--
			02655	00010	C.4.1.4	--	--	--
			02655	00011	C.3.1.3	--	--	--
			02655	00012	C.2.4.1.18	--	--	--
			02655	00013	C.4.1.5.4	--	--	--
			02655	00014	C.4.1.5.4	--	--	--
			02655	00015	C.7.4	--	--	--
			02655	00016	C.7.3	--	--	--
			02655	00017	C.4.3	--	--	--
			02655	00018	C.7.3	--	--	--
			02655	00019	C.7.3	--	--	--
			02655	00020	C.2.4.1	--	--	--
			02655	00021	C.7.3	--	--	--
			02655	00022	C.7.3	--	--	--
			02655	00023	C.7.3	--	--	--
			02655	00024	C.7.3	--	--	--
			02655	00025	C.7.3	--	--	--
			02655	00026	C.7.3	--	--	--
	Hock, Betty	NV Gen Fed. of Women's Clubs	00517	00001	C.3.1.2	--	--	--
	Hock, Betty E.	NV Gen Fed. of Women's Clubs	00139	00001	C.3.4.2.4	--	--	--
			00139	00002	C.3.4.2.4	--	--	--
	Hoke, M.		01471	00001	C.7.2.2	--	--	--
			01471	00002	C.2.3.1	--	--	--
			01471	00003	C.3.4.4	--	--	--
	Hoke, Michael		01488	00001	C.7.2.2	--	--	--
			01488	00002	C.7.2.2	--	--	--
			01488	00003	C.6.4	--	--	--

C.9-94

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
	Holmes, Richard B.	Dept. of Comprehensive Planning	01263	00044	C.7.1.2	--	--	--
			01263	00045	C.2.7	--	--	--
			01263	00046	C.4.3	--	--	--
			01263	00047	C.2.4.1	--	--	--
			01263	00048	C.4.3	--	--	--
			01263	00049	C.4.3	--	--	--
			01263	00050	C.4.3	--	--	--
			01263	00051	C.7.3	--	--	--
			01263	00052	C.7.3	--	--	--
			01263	00053	C.4.3	--	--	--
			01263	00054	C.4.3	--	--	--
			01263	00055	C.4.3	--	--	--
			01263	00056	C.4.3	--	--	--
			01263	00057	C.4.3	--	--	--
			01263	00058	C.4.3	--	--	--
			01263	00059	C.4.3	--	--	--
			01263	00060	C.4.3	--	--	--
			01263	00061	C.4.3	--	--	--
			01263	00062	C.4.3	--	--	--
			01263	00063	C.4.3	--	--	--
			01263	00064	C.4.3	--	--	--
			01263	00065	C.4.3	--	--	--
			01263	00066	C.4.3	--	--	--
			01263	00067	C.4.3	--	--	--
			01263	00068	C.4.3	--	--	--
			01263	00069	C.4.3	--	--	--
			01263	00070	C.4.3	--	--	--
			01263	00071	C.4.3	--	--	--
			01263	00072	C.4.3	--	--	--
			01263	00073	C.7.3	--	--	--
			01263	00074	C.4.3	--	--	--
			01263	00075	C.4.3	--	--	--
			01263	00076	C.4.3	--	--	--
			01263	00077	C.4.3	--	--	--
			01263	00078	C.7.2	--	--	--
			01263	00079	C.8.3	--	--	--
			01263	00080	C.8.3	--	--	--
			01263	00081	C.8.3	--	--	--

C.9-95

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			01263	00082	C.7.2.1	--	--	--
			01263	00083	C.7.2.2	--	--	--
			01263	00084	C.7.2.2	--	--	--
			01263	00085	C.7.2.3	--	--	--
			01263	00086	C.7.2.5	C.7.2.3	--	--
			01263	00087	C.7.2.3	--	--	--
			01263	00088	C.7.2.5	--	--	--
			01263	00089	C.7.2.5	--	--	--
			01263	00090	C.7.2.5	--	--	--
			01263	00091	C.7.2.5	--	--	--
			01263	00092	C.7.2.5	--	--	--
			01263	00093	C.4.1.4	--	--	--
			01263	00094	C.7.2.6	--	--	--
			01263	00095	C.7.2.6	--	--	--
			01263	00096	C.2.4.1	C.7.2.7	--	--
			01263	00097	C.7.3	--	--	--
			01263	00098	C.7.3	--	--	--
			01263	00099	C.2.4.1	C.7.3	--	--
			01263	00100	C.7.3	--	--	--
			01263	00101	C.7.3	--	--	--
			01263	00102	C.7.3	--	--	--
			01263	00103	C.7.3	--	--	--
			01263	00104	C.7.3	--	--	--
			01263	00105	C.2.4.1	C.7.3	--	--
			01263	00106	C.2.4.1	C.7.3	--	--
			01263	00107	C.7.3	C.2.4.1	--	--
			01263	00108	C.7.4.2	--	--	--
			01263	00109	C.7.4	--	--	--
			01263	00110	C.7.4.2	--	--	--
			01263	00111	C.7.4.1	--	--	--
			01263	00112	C.7.4.3	--	--	--
			01263	00113	C.7.4.1	--	--	--
			01263	00114	C.7.4.3	--	--	--
			01263	00115	C.7.4.3	--	--	--
			01263	00116	C.7.4.3	--	--	--
			01263	00117	C.7.4.3	--	--	--
			01263	00118	C.7.4.4	--	--	--
			01263	00119	C.7.4	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			01263	00120	C.7.4.5	--	--	--
			01263	00121	C.7.4.5	--	--	--
			01263	00122	C.2.4.1	C.7.3	--	--
			01263	00123	C.2.4.1	C.7.3	--	--
			01263	00124	C.7.3	--	--	--
			01263	00125	C.7.4.3	--	--	--
			01263	00126	C.3.1.1	--	--	--
			01263	00127	C.5.9	--	--	--
			01263	00128	C.6.4	--	--	--
			01263	00129	C.6.1	--	--	--
			01263	00130	C.6.1	--	--	--
			01263	00131	C.2.4.1	C.6.1	--	--
			01263	00132	C.6.3	--	--	--
			01263	00133	C.6.4	--	--	--
			01263	00134	C.7.4	--	--	--
			01263	00135	C.7.4.2	--	--	--
			01263	00136	C.7.3	--	--	--
			01263	00137	C.7.3	--	--	--
			01263	00138	C.2.4.1	C.7.3	--	--
			01263	00139	C.2.4.1	C.7.3	--	--
			01263	00140	C.2.4.1	C.7.5	--	--
			01263	00141	C.7.5	--	--	--
			01263	00142	C.5.8	--	--	--
			01263	00143	C.8.1	--	--	--
			01263	00144	C.7.4	--	--	--
			01263	00145	C.4.3	--	--	--
			01263	00146	C.3.4.2.2	--	--	--
			01263	00147	C.3.4.2.2	--	--	--
			01263	00148	C.3.4.2.2	--	--	--
			01263	00149	C.2.4.1	--	--	--
			01263	00001	C.3.1.2	--	--	--
			01263	00002A	C.3.3	--	--	--
			01263	00002B	C.3.4.3	--	--	--
			01263	00003	C.3.4.3	C.3.1.1	--	--
			01263	00004	C.3.4.3	--	--	--
			01263	00005	C.2.4.1	--	--	--
			01263	00006	C.2.4.1	--	--	--
			01263	00007	C.2.4.1	--	--	--

C.9-97

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			01263	00008	C.2.4.1	--	--	--
			01263	00009	C.3.4.3	--	--	--
			01263	00010	C.2.4.1	--	--	--
			01263	00011	C.2.5.1	--	--	--
			01263	00012	C.2.4.1	--	--	--
			01263	00013	C.7.4	--	--	--
			01263	00014	C.7.4	--	--	--
			01263	00015	C.7.4.2	--	--	--
			01263	00016	C.3.4.3	--	--	--
			01263	00017	C.3.1.2	--	--	--
			01263	00018	C.3.1.2	--	--	--
			01263	00019	C.3.1.2	--	--	--
			01263	00020	C.3.1.2	--	--	--
			01263	00021	C.3.1.2	--	--	--
			01263	00022	C.4.1.1	--	--	--
			01263	00023	C.2.7	--	--	--
			01263	00024	C.2.4.3	--	--	--
			01263	00025	C.3.1	--	--	--
			01263	00026	C.6.4	--	--	--
			01263	00027	C.4.1.3.1	--	--	--
			01263	00028	C.5.7	--	--	--
			01263	00029	C.5.8	--	--	--
			01263	00030	C.5.8	--	--	--
			01263	00031	C.5.8	--	--	--
			01263	00032	C.7.3	--	--	--
			01263	00033	C.7.3	--	--	--
			01263	00034	C.4.1.4	--	--	--
			01263	00035	C.7.3	--	--	--
			01263	00036	C.4.1.4	--	--	--
			01263	00037	C.4.1.5.4	--	--	--
			01263	00038	C.4.1.5.4	--	--	--
			01263	00039	C.7.4.2	--	--	--
			01263	00040	C.4.1.5.5	--	--	--
			01263	00041	C.3.4.4	--	--	--
			01263	00042	C.4.1.2.1	--	--	--
			01263	00043	C.7.1.2	--	--	--
			01400	00001	C.2.1.1	--	--	--
			01400	00002	C.2.7	--	--	--

Holtz, Charles

C.9-98

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			01400	00003	C.3.1	--	--	--
			01400	00004	C.7.2.7	--	--	--
			01400	00005	C.4.3	C.7.4	--	--
			01400	00006	C.3.4.3	C.7.4	C.3.4.2.1	--
			01400	00007	C.2.7	C.7.2.7	--	--
			01400	00008	C.6.5	--	--	--
			01400	00009	C.3.4.4	--	--	--
			01400	00010	C.2.4.1	--	--	--
			01400	00011	C.2.4.1	--	--	--
			01400	00012	C.2.1.5	--	--	--
			01400	00013	C.2.4.1	--	--	--
			01400	00014	C.7.4	--	--	--
			01400	00015	C.2.3.2	--	--	--
	Janisek, Stan		01444	00001	C.7.3	--	--	--
			01444	00002	C.2.4.1	--	--	--
			01444	00003	C.3.4.4	--	--	--
			01444	00004	C.2.1.1	--	--	--
	Johnson, Willard E.		00201	00001	C.7.3	--	--	--
			00201	00002	C.7.3	--	--	--
			00201	00003	C.7.3	--	--	--
	Johnson, A.		01476	00001	C.2.1.1	--	--	--
			01476	00002	C.3.4.4	--	--	--
			01476	00003	C.3.1.1	--	--	--
			01476	00004	C.2.7	--	--	--
			01476	00005	C.3.1.2	--	--	--
			01476	00006	C.7.4	--	--	--
			01476	00007	C.7.4.2	--	--	--
			01476	00008	C.7.4.2	--	--	--
			01476	00009	C.2.4.1	--	--	--
			01476	00010	C.2.3.3	--	--	--
			01476	00011	C.5.7	--	--	--
			01476	00012	C.6.4	--	--	--
			01476	00013	C.6.4	--	--	--
			01476	00014	C.6.4	--	--	--
			01476	00015	C.3.1.2	--	--	--
			01476	00016	C.7.2.1	--	--	--
			01476	00017	C.3.4.4	--	--	--
	Kearns, Ardis		01581	00001	C.2.4.1	--	--	--

C.9-99

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			01581	00002	C.2.4.1	C.7.3	--	--
			01581	00003	C.2.4.1	--	--	--
			01581	00004	C.2.4.1	C.7.3	--	--
			01581	00005	C.2.4.1	--	--	--
			01581	00006	C.2.8.3	--	--	--
			01581	00007	C.2.4.1	--	--	--
			01581	00008	C.2.4.1	--	--	--
			01581	00009A	C.3.1.2	--	--	--
			01581	00009B	C.2.4.1	--	--	--
			01581	00010	C.3.1.2	--	--	--
	Knapp, Bob		01433	00001	C.3.4.4	--	--	--
	Koncher, Louis		00138	00001	C.2.8	--	--	--
			00138	00003	C.5.1	--	--	--
			00138	00004	C.2.1.1	--	--	--
	Kouslier, Louis		00426	00001	C.2.8	--	--	--
			00426	00002	C.3.4.4	--	--	--
			00426	00003	C.2.1.1	--	--	--
	Kretschmer, Theresa		00510	00001	C.2.7	--	--	--
			00510	00002	C.7.3	--	--	--
			00510	00003	C.3.4.4	--	--	--
			00510	00004	C.5.7	--	--	--
			00510	00005	C.7.3	--	--	--
	Kretschmer, Theresa		00510	00006	C.2.2	--	--	--
			01483	00001	C.2.6.1	--	--	--
			01483	00002	C.2.4.1	--	--	--
			01483	00003	C.7.4	--	--	--
			01483	00004	C.6.1	--	--	--
			01483	00005	C.6.4	--	--	--
			01483	00006	C.2.4.1	C.7.3	--	--
			01483	00007	C.2.4.1	--	--	--
	Kulas, Pauline A.		00514	00001	C.3.4.4	--	--	--
			00514	00002	C.7.3	--	--	--
			00514	00003	C.3.4.4	--	--	--
	Kulas, Kathy Ann		00515	00001	C.3.4.4	--	--	--
			00515	00002	C.2.4.1	--	--	--
			00515	00003	C.3.4.4	--	--	--
	Kulas, Kenneth M.		00518	00001	C.3.4.4	--	--	--
	Kutenai, K.		01456	00001	C.3.1.2	--	--	--

G.9-100

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			01456	00002	C.3.1.2	C.4.1.1	--	--
			01456	00003	C.2.4.1	--	--	--
			01456	00004	C.5.11	--	--	--
			01456	00005	C.2.8.3	--	--	--
	Loux, Robert		01448	00001	C.3.4.4	C.4.1.1	--	--
			01448	00002	C.7.4	--	--	--
			01448	00003	C.2.2	--	--	--
			01448	00004	C.3.1.2	--	--	--
			01448	00005	C.2.7	--	--	--
	Loux, Robert	Gov's Nuclear Waste Office	01407	00001	C.3.4.4	--	--	--
			01407	00002	C.3.4.4	--	--	--
			01407	00003	C.7.4.2	--	--	--
			01407	00004	C.7.4	--	--	--
			01407	00005	C.7.3	--	--	--
			01407	00007	C.2.4.1	C.7.2	--	--
			01407	00008	C.2.4.1	--	--	--
			01407	00009	C.3.1.2	--	--	--
			01407	00010	C.2.7	--	--	--
			01407	00091	C.5.1	--	--	--
			01407	00092	C.7.2	--	--	--
			01407	00093	C.5.1	--	--	--
	Loux, Robert R.	Nuclear Waste Project Office	02640	00001	C.3.4.4	--	--	--
			02640	00002	C.3.1.2	--	--	--
			02640	00003	C.3.1	--	--	--
			02640	00004	C.3.1.3	--	--	--
			02640	00005	C.3.1.2	--	--	--
			02640	00006	C.3.1.2	--	--	--
			02640	00007	C.3.1.2	C.7.4	--	--
			02640	00008	C.3.1.2	--	--	--
			02640	00009	C.2.1.2	--	--	--
			02640	00010	C.3.1.2	--	--	--
			02640	00011A	C.3.4.1	--	--	--
			02640	00011B	C.3.4.1	--	--	--
			02640	00011C	C.3.4.4	--	--	--
			02640	00012	C.3.4.3	--	--	--
			02640	00013	C.4.1.1	--	--	--
			02640	00014	C.3.4.3	--	--	--
			02640	00015	C.3.1.1	--	--	--

101-610

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02640	00016	C.2.4.1	--	--	--
			02640	00017	C.2.2.1	--	--	--
			02640	00018	C.2.3.1	--	--	--
			02640	00019	C.7.4	--	--	--
			02640	00020	C.7.4	--	--	--
			02640	00021	C.2.4.1	C.4.1.5	--	--
			02640	00022	C.4.1.5	--	--	--
			02640	00023	C.2.6.1	--	--	--
			02640	00024	C.2.6.1	--	--	--
			02640	00025	C.2.4.1	--	--	--
			02640	00026	C.2.5.1	--	--	--
			02640	00027	C.2.5.1	--	--	--
			02640	00028	C.2.5.1	C.3.1.3	--	--
			02640	00029	C.2.5.1	--	--	--
			02640	00030	C.2.4.1	--	--	--
			02640	00031	C.2.4.1	--	--	--
			02640	00032	C.2.4.1	--	--	--
			02640	00033	C.2.4.1	--	--	--
			02640	00034	C.2.4.1	--	--	--
			02640	00035	C.3.4.3	--	--	--
			02640	00036	C.2.4.1	--	--	--
			02640	00037	C.4.3	--	--	--
			02640	00038	C.2.7	--	--	--
			02640	00039	C.3.1.3	--	--	--
			02640	00041	C.5.9	--	--	--
			02640	00042	C.5.9	--	--	--
			02640	00043	C.4.1.2.3	--	--	--
			02640	00044	C.4.1.2.3	--	--	--
			02640	00045	C.4.1.2.3	--	--	--
			02640	00046	C.4.1.2.3	--	--	--
			02640	00047	C.4.1.2.3	--	--	--
			02640	00048	C.3.1.3	--	--	--
			02640	00049	C.7.4	--	--	--
			02640	00050	C.4.1.5	--	--	--
			02640	00051	C.4.1.5	--	--	--
			02640	00052	C.4.3	--	--	--
			02640	00053	C.4.3	--	--	--
			02640	00054	C.7.4.2	--	--	--

0.9-102

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			02640	00055	C.7.4.2	--	--	--
			02640	00056	C.7.4.2	--	--	--
			02640	00057	C.4.1.1	--	--	--
			02640	00058	C.4.1.1	--	--	--
			02640	00059	C.5.7	--	--	--
			02640	00060	C.5.7	--	--	--
			02640	00061	C.5.7	--	--	--
			02640	00062	C.5.7	--	--	--
			02640	00063	C.5.7	--	--	--
			02640	00064	C.5.7	--	--	--
			02640	00065	C.5.7	--	--	--
			02640	00066	C.5.1	--	--	--
			02640	00067	C.5.1	--	--	--
			02640	00068	C.5.1	--	--	--
			02640	00069	C.5.1	--	--	--
			02640	00070	C.5.4	--	--	--
			02640	00071	C.5.4	--	--	--
			02640	00072	C.5.2	--	--	--
			02640	00073	C.5.2	--	--	--
			02640	00074	C.5.2	--	--	--
			02640	00075	C.5.2	--	--	--
			02640	00076	C.5.2	--	--	--
			02640	00077	C.5.2	--	--	--
			02640	00078	C.5.2	--	--	--
			02640	00079	C.5.2	--	--	--
			02640	00080	C.5.2	--	--	--
			02640	00081	C.8.2	--	--	--
			02640	00082	C.8.2	--	--	--
			02640	00083	C.8.2	--	--	--
			02640	00084	C.8.2	--	--	--
			02640	00085	C.8.2	--	--	--
			02640	00086	C.8.2	--	--	--
			02640	00087	C.8.2	--	--	--
			02640	00088	C.8.2	--	--	--
			02640	00089	C.5.8	--	--	--
			02640	00090	C.4.2.2	--	--	--
			02640	00091	C.4.2.2	--	--	--
			02640	00092	C.4.3	--	--	--

C.9-103

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			02640	00093	C.4.3	--	--	--
			02640	00094	C.4.3	--	--	--
			02640	00095	C.4.3	--	--	--
			02640	00096	C.8.2	--	--	--
			02640	00097	C.8.2	--	--	--
			02640	00098	C.4.3	--	--	--
			02640	00099	C.5.10	--	--	--
			02640	00100	C.3.1.1	--	--	--
			02640	00101	C.5.7	--	--	--
			02640	00102	C.8.4	--	--	--
			02640	00103	C.8.4	C.5.1	--	--
			02640	00104	C.6.4	--	--	--
			02640	00105	C.5.10	--	--	--
			02640	00106	C.3.1.2	C.3.1.3	--	--
			02640	00107	C.3.1.2	C.3.1.3	--	--
			02640	00108	C.3.1.2	C.3.1.3	--	--
			02640	00109	C.3.1.2	--	--	--
			02640	00110	C.3.1.2	--	--	--
			02640	00111	C.3.1.2	--	--	--
			02640	00112	C.2.1.2	--	--	--
			02640	00113	C.3.1.3	--	--	--
			02640	00114	C.2.7	C.3.1.3	--	--
			02640	00115	C.2.8.2	C.3.1.3	--	--
			02640	00116	C.2.7	--	--	--
			02640	00117	C.2.1.3	--	--	--
			02640	00118	C.2.4.1	--	--	--
			02640	00119	C.2.4.2	--	--	--
			02640	00120	C.2.7.1	--	--	--
			02640	00121	C.2.7.1	--	--	--
			02640	00122	C.3.1.3	--	--	--
			02640	00123	C.3.1.3	--	--	--
			02640	00124	C.3.1.2	--	--	--
			02640	00125	C.3.1.2	--	--	--
			02640	00126	C.4.1	--	--	--
			02640	00523	C.5.8	--	--	--
			01415	00001	C.2.1.1	--	--	--
			01415	00002	C.2.7	--	--	--
			01415	00003	C.2.7	--	--	--

Lowicki, Peter

C.9-104

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			01415	00004	C.2.8.2	---	---	---
			01415	00005	C.2.7	C.3.5	---	---
			01415	00006	C.3.1.1	---	---	---
			01415	00007	C.2.4.1	C.7.2	---	---
			01415	00008	C.2.7	---	---	---
	Lurie, Mayor Ron		01408	00001	C.2.7	---	---	---
			01408	00002	C.2.7	---	---	---
			01408	00003	C.2.4.1	---	---	---
			01408	00004	C.2.4.1	---	---	---
			01408	00005	C.2.2.1	---	---	---
			01408	00006	C.2.4.1	---	---	---
	Macaulay, B.		01465	00001	C.2.1.1	---	---	---
			01465	00002	C.2.1.1	C.7.3	---	---
			01465	00003	C.7.2	---	---	---
			01465	00004	C.7.2	---	---	---
			01465	00005	C.2.4.1	---	---	---
			01465	00006	C.7.3	---	---	---
			01465	00007	C.3.4.4	---	---	---
	Markoff, Mike		01443	00001	C.2.1.1	---	---	---
	Markoff, Mike		01445	00001	C.2.4.1	---	---	---
			01445	00002	C.2.1.1	---	---	---
	Marshall, Lawrence		01484	00001	C.3.4.4	---	---	---
	McFarland, Linda	Amargosa Town Advisory Council	01403	00001	C.3.4.4	---	---	---
	McGirk, Blair		01481	00001	C.3.4.4	---	---	---
			01481	00002	C.3.4.4	---	---	---
			01481	00003	C.3.1.2	C.7.3	---	---
			01481	00004	C.5.7	---	---	---
			01481	00005	C.6.4	---	---	---
			01481	00006	C.5.4	---	---	---
			01481	00007	C.2.8.1	---	---	---
			01481	00008	C.2.5.2	---	---	---
			01481	00009	C.2.6.1	---	---	---
	McKey, Mary		01480	00001	C.7.2	---	---	---
			01480	00002	C.3.4.4	---	---	---
			01480	00003	C.3.4.4	---	---	---
	Hiffin, Martin	Water Resources Center	02659	00023	C.5.1	---	---	---
			02659	00024	C.5.1	---	---	---
			02659	00025	C.5.1	---	---	---

C.9-105

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02659	00026	C.5.1	--	--	--
			02659	00027	C.5.1	--	--	--
			02659	00028	C.5.1	--	--	--
			02659	00029	C.5.1	--	--	--
			02659	00030	C.5.1	--	--	--
			02659	00031	C.5.1	--	--	--
			02659	00032	C.5.1	--	--	--
			02659	00033	C.5.1	--	--	--
			02659	00034	C.5.1	--	--	--
			02659	00035	C.5.1	--	--	--
			02659	00036	C.5.1	--	--	--
			02659	00037	C.5.1	--	--	--
			02659	00038	C.5.1	--	--	--
			02659	00039	C.5.1	--	--	--
			02659	00040	C.5.1	--	--	--
			02659	00041	C.5.1	--	--	--
			02659	00042	C.5.1	--	--	--
			02659	00043	C.5.1	--	--	--
			02659	00044	C.5.1	--	--	--
			02659	00045	C.5.1	--	--	--
			02659	00046	C.5.1	--	--	--
			02659	00047	C.5.1	--	--	--
			02659	00048	C.5.1	--	--	--
			02659	00049	C.5.1	--	--	--
			02659	00050	C.5.1	--	--	--
			02659	00051	C.5.1	--	--	--
			02659	00052	C.5.1	--	--	--
			02659	00053	C.5.1	--	--	--
			02659	00054	C.5.1	--	--	--
			02659	00055	C.5.1	--	--	--
			02659	00056	C.5.1	--	--	--
			02659	00057	C.5.1	--	--	--
			02659	00058	C.5.1	--	--	--
			02659	00059	C.5.1	--	--	--
			02659	00060	C.5.4	--	--	--
			02659	00061	C.5.1	--	--	--
			02659	00062	C.5.1	--	--	--
			02659	00063	C.5.1	--	--	--

G.9-106

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			02659	00064	C.5.2	--	--	--
			02659	00065	C.5.2	--	--	--
			02659	00066	C.5.1	--	--	--
			02659	00067	C.5.1	--	--	--
			02659	00068	C.5.2	--	--	--
			02659	00069	C.5.2	--	--	--
			02659	00070	C.5.2	--	--	--
			02659	00071	C.5.2	--	--	--
			02659	00072	C.5.2	--	--	--
			02659	00073	C.5.2	--	--	--
			02659	00074	C.5.2	--	--	--
			02659	00075	C.5.2	--	--	--
			02659	00076	C.5.2	--	--	--
			02659	00077	C.5.2	--	--	--
			02659	00078	C.5.2	--	--	--
			02659	00079	C.5.2	--	--	--
			02659	00080	C.2.7	C.5.2	--	--
			02659	00081	C.5.2	--	--	--
			02659	00082	C.5.2	--	--	--
			02659	00083	C.4.1.1	--	--	--
			02659	00084	C.4.3	--	--	--
			02659	00085	C.5.6	--	--	--
			02659	00086	C.5.6	--	--	--
			02659	00087	C.5.6	--	--	--
			02659	00088	C.5.6	--	--	--
			02659	00089	C.5.6	--	--	--
			02659	00090	C.5.6	--	--	--
			02659	00091	C.2.7	C.3.1.3	--	--
			02659	00092	C.2.7	C.3.1.3	--	--
			02659	00093	C.4.1.2.2	--	--	--
			02659	00094	C.4.1.2.2	--	--	--
			02659	00095	C.2.7	C.4.1.2.2	--	--
			02659	00096	C.4.1.2.2	--	--	--
			02659	00097	C.4.1.2.2	--	--	--
			02659	00098	C.4.1.2.2	--	--	--
			02659	00099	C.5.2	--	--	--
			02659	00100	C.2.7	--	--	--
			02659	00101	C.5.2	--	--	--

C.9-107

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02659	00102	C.5.2	--	--	--
			02659	00103	C.5.2	--	--	--
			02659	00104	C.5.2	--	--	--
			02659	00105	C.5.2	--	--	--
			02659	00106	C.2.7	C.4.1.2.2	--	--
			02659	00107	C.2.7	C.4.3	--	--
			02659	00108	C.3.1.2	--	--	--
			02659	00109	C.3.1.2	--	--	--
			02659	00110	C.4.1.3.3	--	--	--
			02659	00111	C.4.1.2.2	--	--	--
			02659	00112	C.5.1	--	--	--
			02659	00113	C.5.2	--	--	--
			02659	00114	C.5.2	--	--	--
			02659	00115	C.4.1.1	--	--	--
			02659	00116	C.4.1.1	--	--	--
			02659	00117	C.5.1	--	--	--
			02659	00118	C.5.1	--	--	--
			02659	00119	C.5.5	--	--	--
			02659	00120	C.4.1.2.2	--	--	--
			02659	00121	C.4.1.2.2	--	--	--
			02659	00122	C.4.1.2.2	--	--	--
			02659	00123	C.4.3	--	--	--
			02659	00124	C.4.2.2	--	--	--
			02659	00125	C.4.2.2	--	--	--
			02659	00126	C.4.2.2	--	--	--
			02659	00127	C.4.2.2	--	--	--
			02659	00128	C.4.2.2	--	--	--
			02659	00129	C.7.1.1	--	--	--
			02659	00130	C.7.1.1	--	--	--
			02659	00131	C.7.1.1	--	--	--
			02659	00132	C.7.1.2	--	--	--
			02659	00133	C.4.3	--	--	--
			02659	00134	C.4.3	C.8.2	--	--
			02659	00135	C.5.3	--	--	--
			02659	00136	C.5.3	--	--	--
			02659	00137	C.8.2	--	--	--
			02659	00138	C.5.4	--	--	--
			02659	00139	C.5.1	--	--	--

801-6-108

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02659	00140	C.5.1	--	--	--
			02659	00141	C.8.3	--	--	--
			02659	00142	C.8.3	--	--	--
			02659	00143	C.7.2	--	--	--
			02659	00144	C.7.2.6	--	--	--
			02659	00145	C.7.2.6	--	--	--
			02659	00146	C.7.2.7	--	--	--
			02659	00147	C.6.5	--	--	--
			02659	00148	C.6.5	--	--	--
			02659	00149	C.6.5	--	--	--
			02659	00150	C.5.1	--	--	--
			02659	00151	C.5.1	--	--	--
			02659	00152	C.5.1	--	--	--
			02659	00153	C.6.5	--	--	--
			02659	00154	C.6.5	--	--	--
			02659	00155	C.5.1	--	--	--
			02659	00156	C.5.1	--	--	--
			02659	00157	C.5.1	--	--	--
			02659	00158	C.5.2	--	--	--
			02659	00159	C.5.1	--	--	--
			02659	00160	C.6.5	--	--	--
			02659	00161	C.5.1	--	--	--
			02659	00162	C.6.5	--	--	--
			02659	00163	C.6.5	--	--	--
			02659	00164	C.5.1	--	--	--
			02659	00165	C.5.1	--	--	--
			02659	00166	C.5.1	--	--	--
			02659	00167	C.5.1	--	--	--
			02659	00168	C.5.1	--	--	--
			02659	00169	C.5.1	--	--	--
			02659	00170	C.5.1	--	--	--
			02659	00171	C.5.1	--	--	--
			02659	00172	C.5.1	--	--	--
			02659	00173	C.5.1	--	--	--
			02659	00174	C.5.1	--	--	--
			02659	00175	C.5.1	--	--	--
			02659	00176	C.5.1	--	--	--
			02659	00177	C.5.1	--	--	--

C.9-109

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02659	00178	C.5.1	--	--	--
			02659	00179	C.5.1	--	--	--
			02659	00180	C.5.1	--	--	--
			02659	00181	C.5.1	--	--	--
			02659	00182	C.5.1	--	--	--
			02659	00183	C.5.1	--	--	--
			02659	00184	C.5.1	--	--	--
			02659	00185	C.5.1	--	--	--
			02659	00186	C.5.1	--	--	--
			02659	00187	C.5.1	--	--	--
			02659	00188	C.5.1	--	--	--
			02659	00189	C.5.1	--	--	--
			02659	00190	C.5.1	--	--	--
			02659	00191	C.5.2	--	--	--
			02659	00192	C.5.1	--	--	--
			02659	00193	C.5.1	--	--	--
			02659	00194	C.5.2	--	--	--
			02659	00195	C.5.2	--	--	--
			02659	00196	C.5.2	--	--	--
			02659	00197	C.5.2	--	--	--
			02659	00198	C.5.2	--	--	--
			02659	00199	C.5.2	--	--	--
			02659	00200	C.5.2	--	--	--
			02659	00201	C.5.1	--	--	--
			02659	00202	C.5.1	--	--	--
			02659	00203	C.5.1	--	--	--
			02659	00204	C.5.1	--	--	--
			02659	00205	C.5.1	--	--	--
			02659	00206	C.5.1	--	--	--
			02659	00207	C.5.1	--	--	--
			02659	00208	C.5.2	--	--	--
			02659	00209	C.5.1	--	--	--
			02659	00210	C.5.1	--	--	--
			02659	00211	C.5.2	--	--	--
			02659	00212	C.5.2	--	--	--
			02659	00213	C.5.2	--	--	--
			02659	00214	C.5.2	--	--	--
			02659	00215	C.5.2	--	--	--

C.9-110

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02659	00216	C.5.2	--	--	--
			02659	00217	C.5.2	--	--	--
			02659	00218	C.5.2	--	--	--
			02659	00219	C.5.1	--	--	--
			02659	00220	C.5.2	--	--	--
			02659	00221	C.5.2	--	--	--
			02659	00222	C.5.2	--	--	--
			02659	00223	C.5.2	--	--	--
			02659	00224	C.5.2	--	--	--
			02659	00225	C.5.2	--	--	--
			02659	00226	C.5.2	--	--	--
			02659	00227	C.5.2	--	--	--
			02659	00228	C.5.2	--	--	--
			02659	00229	C.5.2	--	--	--
			02659	00230	C.5.2	--	--	--
			02659	00231	C.5.2	--	--	--
			02659	00232	C.5.2	--	--	--
			02659	00233	C.5.2	--	--	--
			02659	00234	C.5.2	--	--	--
			02659	00235	C.5.2	--	--	--
			02659	00236	C.5.2	--	--	--
			02659	00237	C.5.2	--	--	--
			02659	00238	C.5.2	--	--	--
			02659	00239	C.5.2	--	--	--
			02659	00240	C.5.2	--	--	--
			02659	00241	C.5.2	--	--	--
			02659	00242	C.5.2	--	--	--
			02659	00243	C.5.2	--	--	--
			02659	00244	C.5.2	--	--	--
			02659	00245	C.5.2	--	--	--
			02659	00246	C.5.2	--	--	--
			02659	00247	C.5.2	--	--	--
			02659	00248	C.5.2	--	--	--
			02659	00249	C.5.2	--	--	--
			02659	00250	C.5.2	--	--	--
			02659	00251	C.5.2	--	--	--
			02659	00252	C.5.2	--	--	--
			02659	00253	C.5.2	--	--	--

C.9-111

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02659	00254	C.5.2	--	--	--
			02659	00255	C.5.2	--	--	--
			02659	00256	C.5.2	--	--	--
			02659	00257	C.5.2	--	--	--
			02659	00258	C.5.2	--	--	--
			02659	00259	C.5.2	--	--	--
			02659	00260	C.5.2	--	--	--
			02659	00261	C.5.2	--	--	--
			02659	00262	C.5.2	--	--	--
			02659	00263	C.5.2	--	--	--
			02659	00264	C.5.2	--	--	--
			02659	00265	C.5.2	--	--	--
			02659	00266	C.5.2	--	--	--
			02659	00267	C.5.2	--	--	--
			02659	00268	C.5.2	--	--	--
			02659	00269	C.5.2	--	--	--
			02659	00270	C.5.2	--	--	--
			02659	00271	C.5.2	--	--	--
			02659	00272	C.5.2	--	--	--
			02659	00273	C.5.2	--	--	--
			02659	00274	C.5.2	--	--	--
			02659	00275	C.5.2	--	--	--
			02659	00276	C.5.2	--	--	--
			02659	00277	C.5.2	--	--	--
			02659	00278	C.5.2	--	--	--
			02659	00279	C.5.2	--	--	--
			02659	00280	C.5.2	--	--	--
			02659	00281	C.5.2	--	--	--
			02659	00282	C.5.2	--	--	--
			02659	00283	C.5.3	--	--	--
			02659	00284	C.5.3	--	--	--
			02659	00285	C.5.3	--	--	--
			02659	00286	C.5.3	--	--	--
			02659	00287	C.5.3	--	--	--
			02659	00288	C.5.3	--	--	--
			02659	00289	C.5.3	--	--	--
			02659	00290	C.5.3	--	--	--
			02659	00291	C.5.3	--	--	--

G.9-112

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02659	00292	C.5.3	--	--	--
			02659	00293	C.5.3	--	--	--
			02659	00294	C.5.3	--	--	--
			02659	00295	C.5.3	--	--	--
			02659	00296	C.5.4	--	--	--
			02659	00297	C.5.4	--	--	--
			02659	00298	C.5.4	--	--	--
			02659	00299	C.5.4	--	--	--
			02659	00300	C.5.4	--	--	--
			02659	00301	C.5.4	--	--	--
			02659	00302	C.5.4	--	--	--
			02659	00303	C.5.4	--	--	--
			02659	00304	C.5.4	--	--	--
			02659	00305	C.5.4	--	--	--
			02659	00306	C.5.6	--	--	--
			02659	00307	C.5.7	--	--	--
			02659	00308	C.5.7	--	--	--
			02659	00309	C.5.7	--	--	--
			02659	00310	C.5.10	--	--	--
			02659	00311	C.5.10	--	--	--
			02659	00312	C.8.2	--	--	--
			02659	00313	C.8.3	--	--	--
			02659	00314	C.5.11	--	--	--
			02659	00315	C.5.11	--	--	--
			02659	00316	C.5.11	--	--	--
			02659	00317	C.5.11	--	--	--
			02659	00318	C.5.11	--	--	--
			02659	00319	C.5.11	--	--	--
			02659	00320	C.5.11	--	--	--
			02659	00321	C.5.11	--	--	--
			02659	00322	C.5.11	--	--	--
			02659	00323	C.5.11	--	--	--
			02659	00324	C.5.4	--	--	--
			02659	00325	C.5.11	--	--	--
			02659	00326	C.5.11	--	--	--
			02659	00327	C.5.11	--	--	--
			02659	00328	C.3.T.3	--	--	--
			02659	00329	C.3.4	--	--	--

G-9-113

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02659	00330	C.3.1.3	--	--	--
			02659	00331	C.3.4	--	--	--
			02659	00332	C.3.4	--	--	--
			02659	00333	C.3.4	--	--	--
			02659	00334	C.3.1.3	--	--	--
			02659	00335	C.3.4	--	--	--
			02659	00336	C.3.4	--	--	--
			02659	00337	C.3.4	--	--	--
			02659	00338	C.3.4	--	--	--
			02659	00339	C.3.4	--	--	--
			02659	00340	C.3.1.3	--	--	--
			02659	00341	C.2.7	--	--	--
			02659	00342	C.3.4	--	--	--
			02659	00343	C.3.1.2	--	--	--
			02659	00344	C.3.1.2	--	--	--
			02659	00001	C.3.1.3	--	--	--
			02659	00002	C.3.1.3	--	--	--
			02659	00003	C.3.1.3	--	--	--
			02659	00004	C.3.1.3	--	--	--
			02659	00005	C.3.1.2	--	--	--
			02659	00006	C.2.7	C.2.8	--	--
			02659	00007	C.2.7	C.2.8	--	--
			02659	00008	C.4.1.2	C.5.1	C.5.2	--
			02659	00009	C.4.1.2.2	C.5.1	C.5.2	C.5.2
			02659	00010	C.4.2.1	--	--	--
			02659	00011	C.5.4	--	--	--
			02659	00012	C.5.4	--	--	--
			02659	00013	C.5.4	--	--	--
			02659	00014	C.4.1.3.3	--	--	--
			02659	00015	C.2.8.3	C.4.1.3.3	--	--
			02659	00016	C.2.8.3	C.4.1.3.3	--	--
			02659	00017	C.5.4	--	--	--
			02659	00018	C.5.1	--	--	--
			02659	00019	C.5.1	--	--	--
			02659	00020	C.5.1	--	--	--
			02659	00021	C.5.1	--	--	--
			02659	00022	C.5.1	--	--	--
			01485	00001A	C.7.2.2	--	--	--

Miller, Glen

G-9-11A

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			01485	00001B	C.7.4.3	--	--	--
			01485	00002	C.7.2.2	--	--	--
			01485	00003	C.5.4	--	--	--
			01485	00004	C.6.4	--	--	--
			01485	00005	C.3.1.2	--	--	--
			01485	00006	C.7.2.1	--	--	--
	Millman, Dr. J.		01458	00001	C.2.3.1	--	--	--
			01458	00002	C.7.3	--	--	--
			01458	00003	C.2.3.3	--	--	--
			01458	00004	C.7.4.2	--	--	--
			01458	00005	C.2.8.1	--	--	--
			01458	00006	C.3.4.4	--	--	--
	Mills, Joe		01436	00001	C.4.1.3.7	--	--	--
			01436	00002	C.2.8.2	--	--	--
	Molini, William A.	Nevada Dept. of Wildlife	02670	00001	C.7.2.2	--	--	--
			02670	00002	C.7.2.2	--	--	--
			02670	00003	C.7.2.2	--	--	--
	Montrose, K. Hugh	Lovelock City Council	01430	00001	C.3.4.4	--	--	--
	Mose, Elwood	Department of Commerce	02657	00001	C.7.3	--	--	--
			02657	00002	C.7.2.6	--	--	--
			02657	00003	C.7.2.6	--	--	--
	Oakley, Bessie		01491	00001	C.2.1.1	--	--	--
			01491	00002	C.3.4.4	--	--	--
	Opie, Colonel		01492	00001	C.6.5	--	--	--
	Painter, Ms.		01473	00001	C.3.1.3	--	--	--
			01473	00002	C.3.1.3	--	--	--
			01473	00003	C.2.4.1	C.7.3	--	--
			01473	00004	C.2.6.1	--	--	--
	Palich, Joseph		01573	00001	C.3.4.4	--	--	--
			01573	00002	C.2.5.2	--	--	--
	Peterson, Dan		01404	00002	C.2.8	--	--	--
			01404	00003	C.2.1.2	--	--	--
			01404	00004	C.2.1.2	--	--	--
			01404	00005	C.2.1.2	--	--	--
	Petition		01425	00001	C.3.1.2	--	--	--
	Poulos, Director, R. Jane	City of North Las Vegas	02646	00001	C.2.7	--	--	--
			02646	00002	C.4.1.5	--	--	--
			02646	00003	C.4.1.3.3	--	--	--

C.9-115

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02646	00004	C.7.4.2	--	--	--
			02646	00005	C.7.4.2	--	--	--
			02646	00006	C.4.1.5	--	--	--
			02646	00007	C.4.1.5	--	--	--
			02646	00008	C.4.1.5	--	--	--
			02646	00009	C.3.1.3	--	--	--
			02646	00010	C.4.1.5.4	--	--	--
			02646	00011	C.4.1.5.4	--	--	--
			02646	00012	C.4.1.5.4	--	--	--
			02646	00013	C.7.3	--	--	--
			02646	00014	C.7.3	--	--	--
			02646	00015	C.7.3	--	--	--
			02646	00016	C.5.11	--	--	--
			02646	00017	C.3.1.3	--	--	--
			02646	00018	C.7.1.2	--	--	--
			02646	00019	C.4.1.5.4	--	--	--
			02646	00020	C.2.4.1	--	--	--
			02646	00021	C.2.4.1	--	--	--
			02646	00022	C.2.4.1	--	--	--
			02646	00023	C.3.1.3	--	--	--
			02646	00024	C.3.1.2	--	--	--
			02646	00025	C.4.1.4	--	--	--
			02646	00026	C.4.1.4	--	--	--
			02646	00027	C.4.1.4	--	--	--
			02646	00028	C.2.4.1	--	--	--
			02646	00029	C.2.4.1	--	--	--
			02646	00030	C.4.1.4	--	--	--
			02646	00033	C.7.2.7	--	--	--
			02646	00034	C.2.4.1	C.4.1.3.7	--	--
			02646	00035	C.2.4.1	C.4.1.3.7	--	--
			02646	00036	C.2.4.1	C.4.1.3.7	--	--
			02646	00037	C.2.4.1	--	--	--
			02646	00038	C.2.4.1	--	--	--
			02646	00039	C.2.5	--	--	--
			02646	00040	C.2.5	--	--	--
			02646	00041	C.2.7	--	--	--
			02646	00042	C.2.4.1	--	--	--
			02646	00043	C.2.4.1	--	--	--

C.9-116

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			02646	00044	C.2.5	--	--	--
			02646	00045	C.2.4.1	--	--	--
			02646	00046	C.3.4.2.2	--	--	--
			02646	00047	C.7.2.3	--	--	--
			02646	00048	C.2.4.1	--	--	--
			02646	00049	C.2.4.1	--	--	--
			02646	00050	C.2.4.1	C.7.3	--	--
			02646	00051	C.7.3	--	--	--
			02646	00052	C.7.3	--	--	--
			02646	00053	C.7.3	--	--	--
			02646	00054	C.2.3.2	--	--	--
			02646	00055	C.2.4.1	--	--	--
			02646	00056	C.2.4.1	--	--	--
			02646	00057	C.2.4.1	--	--	--
			02646	00058	C.2.3.2	--	--	--
			02646	00059	C.2.4.1	--	--	--
			02646	00060	C.2.3.2	--	--	--
			02646	00061	C.2.1.3	--	--	--
	Rader, Scott		01487	00002	C.2.4.1	C.7.3	--	--
			01487	00003	C.5.7	--	--	--
	Reinsehl, Toni		01421	00001	C.2.3.2	--	--	--
	Reiss, B.		01464	00001	C.3.4.2.1	--	--	--
	Robbins, E.		01477	00001	C.5.7	--	--	--
			01477	00002	C.7.3	--	--	--
			01477	00003	C.6.4	--	--	--
	Robertson, J.		01460	00001	C.7.4.2	--	--	--
			01460	00002	C.3.4.4	--	--	--
			01460	00003	C.2.4.1	C.7.3	--	--
			01460	00004	C.7.3	--	--	--
	Robinson, William J.	UNLV Bus. & Econo. Research	02652	00001	C.2.7	--	--	--
			02652	00002	C.2.7	--	--	--
			02652	00003	C.2.7	--	--	--
			02652	00004	C.7.4	--	--	--
			02652	00005	C.7.3	--	--	--
			02652	00006	C.7.4	--	--	--
			02652	00007	C.7.3	--	--	--
			02652	00008	C.4.3	--	--	--
			02652	00009	C.4.3	--	--	--

C.9-117

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02652	00010	C.7.2	--	--	--
			02652	00011	C.2.5	--	--	--
			02652	00012	C.7.4.2	--	--	--
			02652	00013	C.2.4.1	C.7.4	--	--
			02652	00014	C.4.3	--	--	--
			02652	00015	C.7.4.2	--	--	--
			02652	00016	C.7.4.2	--	--	--
			02652	00017	C.7.4.2	--	--	--
			02652	00018	C.7.4.2	--	--	--
			02652	00019	C.7.4.2	--	--	--
			02652	00020	C.7.4.2	--	--	--
			02652	00021	C.7.4.2	--	--	--
			02652	00022	C.7.4.2	--	--	--
			02652	00023	C.3.1.3	--	--	--
			02652	00024	C.7.4	--	--	--
			02652	00025	C.7.3	--	--	--
			02652	00026	C.4.1.5.3	--	--	--
			02652	00027	C.7.4.3	--	--	--
			02652	00028	C.4.1.5.3	--	--	--
			02652	00029	C.7.4.3	--	--	--
			02652	00030	C.4.1.5.4	--	--	--
			02652	00031	C.7.4.5	--	--	--
			02652	00032	C.7.1.2	--	--	--
			02652	00033	C.7.1.2	--	--	--
			02652	00034	C.4.3	--	--	--
			02652	00035	C.7.4.2	--	--	--
			02652	00036	C.7.4.3	--	--	--
			02652	00037	C.7.4.2	--	--	--
			02652	00038	C.2.1	--	--	--
			02652	00039	C.7.3	--	--	--
			02652	00040	C.2.4.1	C.7.3	--	--
			02652	00041	C.7.3	--	--	--
			02652	00042	C.7.4	--	--	--
			02652	00043	C.7.4.2	--	--	--
			02652	00044	C.7.4.2	--	--	--
			02652	00045	C.7.4.2	--	--	--
			02652	00046	C.7.4.1	--	--	--
			02652	00047	C.7.4.2	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02652	00048	C.7.4.2	--	--	--
			02652	00049	C.7.4.2	--	--	--
			02652	00050	C.7.4.3	--	--	--
			02652	00051	C.7.4.1	--	--	--
			02652	00052	C.7.4.3	--	--	--
			02652	00053	C.7.4.3	--	--	--
			02652	00054	C.7.4.3	--	--	--
			02652	00055	C.7.4.3	--	--	--
			02652	00056	C.7.4.4	--	--	--
Rosse, Verne		St of NV, Dept Conserv & Nat Res	02650	00001	C.2.1.2	--	--	--
			02650	00002A	C.3.1.2	--	--	--
			02650	00002B	C.3.4	--	--	--
			02650	00003	C.5.9	--	--	--
			02650	00004	C.5.7	--	--	--
			02650	00005	C.4.1.3.1	--	--	--
			02650	00006	C.4.1.3.6	--	--	--
			02650	00008	C.4.1.3.6	--	--	--
			02650	00009	C.4.1.3.6	--	--	--
			02650	00010	C.4.1.3.6	--	--	--
			02650	00011	C.4.1.3.3	--	--	--
			02650	00012	C.7.2.3	--	--	--
			02650	00013	C.4.3	--	--	--
			02650	00014	C.4.1.3.3	--	--	--
			02650	00015	C.7.2.3	--	--	--
			02650	00016	C.7.2.2	--	--	--
			02650	00017	C.7.2.2	--	--	--
			02650	00018	C.7.2.2	--	--	--
			02650	00019	C.7.2.2	--	--	--
			02650	00020	C.5.1	--	--	--
			02650	00021	C.8.3	--	--	--
			02650	00022	C.8.1	--	--	--
			02650	00023	C.4.3	--	--	--
			02650	00024	C.7.4.3	--	--	--
			02650	00025	C.7.4.3	--	--	--
			02650	00026	C.7.4.3	--	--	--
			02650	00027	C.5.8	--	--	--
			02650	00028	C.5.1	--	--	--
			02650	00029	C.3.1.2	--	--	--

G.9-119

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02650	00030	C.3.1.2	--	--	--
			02650	00031	C.4.1.1	--	--	--
			02650	00032	C.4.1.2.2	--	--	--
			02650	00033	C.5.1	--	--	--
			02650	00034	C.4.3	--	--	--
			02650	00035	C.4.1.3.1	--	--	--
			02650	00036	C.5.7	--	--	--
			02650	00037	C.5.7	--	--	--
			02650	00038	C.5.7	--	--	--
			02650	00039	C.5.8	--	--	--
			02650	00040	C.4.1.2.3	--	--	--
			02650	00041	C.4.1.3.1	--	--	--
			02650	00042	C.4.1.3.6	--	--	--
			02650	00043	C.4.1.4	--	--	--
			02650	00044	C.4.1.5	--	--	--
			02650	00045	C.4.1.2.3	--	--	--
			02650	00046	C.4.1.5	--	--	--
			02650	00047	C.4.1.5.3	--	--	--
			02650	00048	C.7.1.1	--	--	--
			02650	00049	C.4.2	--	--	--
			02650	00050	C.4.2.1	--	--	--
			02650	00051	C.7.1.1	--	--	--
			02650	00052	C.4.3	--	--	--
			02650	00053	C.7.2.6	--	--	--
			02650	00054	C.4.3	--	--	--
			02650	00055	C.4.3.	--	--	--
			02650	00056	C.7.2.1	--	--	--
			02650	00057	C.7.2.6	--	--	--
			02650	00058	C.7.2.7	--	--	--
			02650	00059	C.7.4.2	--	--	--
			02650	00060	C.4.3	--	--	--
			02650	00061	C.5.1	--	--	--
			02650	00062	C.7.2	--	--	--
			02650	00063	C.7.2	--	--	--
			02650	00064	C.7.1.2	--	--	--
			02650	00065	C.5.3	--	--	--
			02650	00066	C.4.2.1	--	--	--
			02650	00067	C.8.3	--	--	--

C.9-120

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION					
					FIRST	SECOND	THIRD	FOURTH		
Nevada (continued)										
Rosse, Mr.	Western Shoshone National Council	02650	00068	C.5.11	--	--	--	--		
		01450	00001	C.3.1	--	--	--	--		
		01450	00002	C.2.4.1	--	--	--	--		
		01450	00003	C.7.2	--	--	--	--		
		01450	00004	C.7.4	--	--	--	--		
		01450	00005	C.3.1.2	--	--	--	--		
		Rosse, Mr.	Yomba Shoshone Tribe	01451	00001	C.3.4.4	--	--	--	--
				01451	00002	C.3.1	--	--	--	--
		Schilling, John	NV Bureau of Mines & Geology	02648	00001	C.5.7	--	--	--	--
				02648	00002	C.5.7	--	--	--	--
				02648	00003	C.5.8	--	--	--	--
				02648	00004	C.5.1	--	--	--	--
				02648	00005	C.3.1.2	--	--	--	--
				02648	00006	C.2.3.1	--	--	--	--
				02648	00007	C.3.1.3	--	--	--	--
				02648	00008	C.3.1.3	--	--	--	--
				02648	00009	C.3.1.3	--	--	--	--
				02648	00010	C.5.7	--	--	--	--
				02648	00011	C.5.7	--	--	--	--
				02648	00012	C.5.7	--	--	--	--
02648	00013			C.5.7	--	--	--	--		
02648	00014	C.3.1.3	--	--	--	--				
02648	00015	C.3.1.3	--	--	--	--				
02648	00016	C.5.1	--	--	--	--				
02648	00017	C.3.1.3	--	--	--	--				
02648	00018	C.5.1	--	--	--	--				
02648	00019	C.5.5	--	--	--	--				
02648	00020	C.5.7	--	--	--	--				
02648	00021	C.5.8	--	--	--	--				
02648	00022	C.5.7	--	--	--	--				
02648	00023	C.5.7	--	--	--	--				
02648	00024	C.5.7	--	--	--	--				
02648	00025	C.5.7	--	--	--	--				
02648	00026	C.5.7	--	--	--	--				
02648	00027	C.4.1.1	--	--	--	--				
02648	00028	C.5.7	--	--	--	--				
02648	00029	C.5.8	--	--	--	--				
02648	00030	C.5.8	--	--	--	--				

C.9-121

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02648	00031	C.5.8	--	--	--
			02648	00032	C.5.8	--	--	--
			02648	00033	C.5.8	--	--	--
			02648	00034	C.4.1.1	--	--	--
			02648	00035	C.5.8	--	--	--
			02648	00036	C.5.8	--	--	--
			02648	00037	C.5.8	--	--	--
			02648	00038	C.4.2.1	--	--	--
			02648	00039	C.5.8	--	--	--
			02648	00040	C.4.2	--	--	--
			02648	00041	C.5.8	--	--	--
			02648	00044	C.5.1	--	--	--
			02648	00045	C.5.1	--	--	--
			02648	00047	C.5.7	--	--	--
			02648	00048	C.5.8	--	--	--
			02648	00049	C.5.8	--	--	--
			02648	00050	C.5.8	--	--	--
			02648	00051	C.5.8	--	--	--
			02648	00052	C.5.8	--	--	--
			02648	00053	C.8.2	--	--	--
			02648	00054	C.8.3	--	--	--
			02648	00055	C.3.4	--	--	--
			02648	00056	C.3.4.2.3	--	--	--
			02648	00057	C.3.4	--	--	--
			01437	00001	C.5.11	--	--	--
	Sherman, I. B.		00358	00001	C.3.4.4	--	--	--
	Shire, D. H.		01442	00001	C.2.8.1	--	--	--
	Shire, Durward		01468	00001	C.3.4.4	--	--	--
	Sill, H.		01468	00002	C.3.1.2	--	--	--
			01468	00003	C.5.4	--	--	--
			01468	00004	C.7.2	--	--	--
			01468	00005	C.7.3	--	--	--
			01468	00006	C.2.4.1	C.7.3	--	--
			01468	00007	C.2.4.1	--	--	--
			01468	00008	C.2.4.1	--	--	--
			01468	00009	C.2.4.1	--	--	--
			01468	00010	C.2.4.1	C.7.3	--	--
	Sill, H.		02641	00001	C.2.4.2	C.7.3	--	--

C.9-122

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02641	00002	C.2.1.1	C.2.8.2	C.3.7	--
			02641	00003	C.3.1.3	--	--	--
			02641	00004	C.2.7	--	--	--
			02641	00005	C.2.1.4	--	--	--
			02641	00006	C.2.7	--	--	--
			02641	00007	C.2.7	--	--	--
			02641	00008	C.2.7	--	--	--
			02641	00009	C.2.7	--	--	--
			02641	00010	C.2.7	--	--	--
			02641	00011	C.2.7	--	--	--
			02641	00012	C.2.7	--	--	--
			02641	00013	C.2.7	--	--	--
			02641	00014	C.2.7	C.3.1.1	--	--
			02641	00015	C.2.7	--	--	--
			02641	00016	C.2.7	--	--	--
			02641	00017	C.2.7	--	--	--
			02641	00018	C.2.7	--	--	--
			02641	00019	C.2.8.3	--	--	--
			02641	00020	C.4.1.4	--	--	--
			02641	00021	C.2.7	--	--	--
			02641	00022	C.2.7	--	--	--
			02641	00023A	C.2.7	--	--	--
			02641	00023B	C.2.7	--	--	--
			02641	00024	C.2.7	--	--	--
			02641	00025	C.2.7	--	--	--
			02641	00026	C.2.7	--	--	--
			02641	00027	C.2.7	--	--	--
			02641	00028	C.3.1	C.7.1.2	--	--
			02641	00029	C.2.7	--	--	--
			02641	00030	C.2.7	--	--	--
			02641	00031	C.2.7	--	--	--
			02641	00032	C.2.7	--	--	--
			02641	00033	C.2.7	--	--	--
			02641	00034	C.2.7	--	--	--
			02641	00035	C.2.7	--	--	--
			02641	00036	C.3.1.2	C.3.1.3	--	--
			02641	00037	C.3.1.2	--	--	--
			02641	00038	C.3.1.2	C.3.1.3	--	--

C.9-123

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02641	00039	C.3.1.3	--	--	--
			02641	00040	C.3.1.2	--	--	--
			02641	00041	C.4.1	--	--	--
			02641	00042	C.3.1.2	--	--	--
			02641	00043	C.3.1.2	--	--	--
			02641	00044	C.3.1.2	--	--	--
			02641	00045	C.3.1.1	--	--	--
			02641	00046	C.3.7	--	--	--
			02641	00047	C.4.1.2.1	--	--	--
			02641	00048	C.4.1.1	--	--	--
			02641	00049	C.4.1.1	--	--	--
			02641	00050	C.4.1.1	--	--	--
			02641	00051	C.4.1.1	--	--	--
			02641	00052	C.3.1.3	--	--	--
			02641	00053	C.4.1.3.3	--	--	--
			02641	00054	C.4.1.3.3	--	--	--
			02641	00055	C.4.1.2.2	--	--	--
			02641	00056	C.4.1.2.2	--	--	--
			02641	00057	C.3.1.2	--	--	--
			02641	00058	C.2.7	--	--	--
			02641	00059	C.2.8.2	--	--	--
			02641	00060	C.3.1.2	--	--	--
			02641	00061	C.3.1.2	--	--	--
			02641	00062	C.3.1.2	--	--	--
			02641	00063	C.3.1.2	--	--	--
			02641	00064	C.3.1.2	--	--	--
			02641	00065	C.3.1.2	--	--	--
			02641	00066	C.3.1.2	--	--	--
			02641	00067	C.5.10	--	--	--
			02641	00068	C.3.1.2	--	--	--
			02641	00069	C.3.1.2	--	--	--
			02641	00070	C.3.1.2	C.5.4	--	--
			02641	00071	C.3.1.2	C.5.4	--	--
			02641	00072	C.3.1.2	--	--	--
			02641	00073	C.3.1.2	C.3.1.3	--	--
			02641	00074	C.3.1.2	--	--	--
			02641	00075	C.3.1.2	--	--	--
			02641	00076	C.3.1.2	--	--	--

G.9-124

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02641	00077	C.3.1.2	--	--	--
			02641	00078	C.3.1.2	--	--	--
			02641	00079	C.3.1.2	C.3.1.3	--	--
			02641	00080	C.3.1.2	C.3.1.3	--	--
			02641	00081	C.2.1.2	--	--	--
			02641	00082	C.3.1.2	--	--	--
			02641	00083	C.3.1.2	--	--	--
			02641	00084	C.3.1.2	--	--	--
			02641	00085	C.3.1.2	--	--	--
			02641	00086	C.3.1.2	--	--	--
			02641	00087	C.3.1.2	--	--	--
			02641	00088	C.3.1.2	--	--	--
			02641	00089	C.3.1.2	--	--	--
			02641	00090	C.3.1.2	--	--	--
			02641	00091	C.5.1	--	--	--
			02641	00092	C.7.4	--	--	--
			02641	00093	C.5.1	--	--	--
			02641	00094	C.5.5	C.5.5	--	--
			02641	00095	C.5.6	--	--	--
			02641	00096	C.5.7	--	--	--
			02641	00097	C.8.4	C.8.4	--	--
			02641	00098	C.5.7	--	--	--
			02641	00099	C.5.7	C.5.7	--	--
			02641	00100	C.5.8	C.5.8	--	--
			02641	00101	C.6.5	C.6.5	--	--
			02641	00102	C.6.4	C.6.4	--	--
			02641	00103	C.8.4	C.8.4	--	--
			02641	00104	C.8.4	C.8.4	--	--
			02641	00105	C.4.1	--	--	--
			02641	00106	C.4.1.3.1	--	--	--
			02641	00107	C.4.3	--	--	--
			02641	00108	C.2.7	--	--	--
			02641	00109	C.4.1.1	--	--	--
			02641	00110	C.4.1.1	--	--	--
			02641	00111	C.4.1.1	--	--	--
			02641	00112A	C.4.1.1	--	--	--
			02641	00112B	C.4.1.1	--	--	--
			02641	00112C	C.4.1.1	--	--	--

G.9-125

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02641	00114	C.4.1.1	--	--	--
			02641	00115	C.4.1.1	--	--	--
			02641	00116	C.7.1.1	--	--	--
			02641	00117	C.4.1.1	--	--	--
			02641	00118	C.4.1.1	--	--	--
			02641	00119	C.4.1.1	--	--	--
			02641	00120	C.4.1.1	--	--	--
			02641	00121	C.4.1.1	--	--	--
			02641	00122	C.4.1.1	--	--	--
			02641	00123	C.4.1.1	--	--	--
			02641	00124	C.4.1.1	--	--	--
			02641	00125	C.4.1.1	--	--	--
			02641	00126	C.4.1.1	--	--	--
			02641	00127	C.4.1.1	--	--	--
			02641	00128	C.4.1.1	--	--	--
			02641	00129	C.4.1.1	--	--	--
			02641	00130	C.4.1.1	--	--	--
			02641	00131	C.4.1.1	--	--	--
			02641	00132	C.4.1.1	--	--	--
			02641	00133	C.4.1.2.2	--	--	--
			02641	00134	C.4.1.2.2	--	--	--
			02641	00135	C.4.1.2.2	--	--	--
			02641	00136	C.4.1.2.3	--	--	--
			02641	00137	C.4.1.2.3	--	--	--
			02641	00138	C.4.1.2.3	--	--	--
			02641	00139	C.4.1.2.3	--	--	--
			02641	00140	C.4.1.2.3	--	--	--
			02641	00141	C.4.1.3.1	--	--	--
			02641	00142	C.4.1.3.1	--	--	--
			02641	00143	C.4.1.3.1	--	--	--
			02641	00144	C.4.1.3.1	--	--	--
			02641	00145	C.4.1.3.1	--	--	--
			02641	00146	C.4.1.3.1	--	--	--
			02641	00147	C.4.1.3.1	--	--	--
			02641	00148	C.4.1.3.1	--	--	--
			02641	00149	C.4.1.3.2	--	--	--
			02641	00150	C.4.1.3.6	--	--	--
			02641	00151	C.4.1.3.6	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02641	00152	C.4.1.3.7	--	--	--
			02641	00153	C.4.1.3.7	--	--	--
			02641	00154	C.4.1.3.7	--	--	--
			02641	00155	C.4.1.4	--	--	--
			02641	00156	C.4.1.4	--	--	--
			02641	00157	C.7.3	--	--	--
			02641	00158	C.4.1.4	--	--	--
			02641	00159	C.7.3	--	--	--
			02641	00160	C.2.4.1	--	--	--
			02641	00161	C.4.1.4	--	--	--
			02641	00162	C.4.1.4	--	--	--
			02641	00163	C.7.3	--	--	--
			02641	00164	C.4.1.4	--	--	--
			02641	00165	C.2.4.1	--	--	--
			02641	00166	C.4.1.4	--	--	--
			02641	00167	C.4.1.4	--	--	--
			02641	00168	C.4.1.4	--	--	--
			02641	00169	C.2.4.1	C.4.1.4	--	--
			02641	00170	C.4.1.4	--	--	--
			02641	00171	C.4.1.4	--	--	--
			02641	00172	C.4.1.5	--	--	--
			02641	00173	C.4.1.5	--	--	--
			02641	00174	C.4.1.5	--	--	--
			02641	00175	C.4.1.5	--	--	--
			02641	00176	C.4.1.5	--	--	--
			02641	00177	C.4.1.5.2	--	--	--
			02641	00178	C.4.1.5.2	--	--	--
			02641	00179	C.4.1.5.2	--	--	--
			02641	00180	C.4.1.5.2	--	--	--
			02641	00181	C.4.1.5.2	--	--	--
			02641	00182	C.4.1.5.2	--	--	--
			02641	00183	C.4.1.5.2	--	--	--
			02641	00184	C.4.1.5.2	--	--	--
			02641	00185	C.4.1.5.2	--	--	--
			02641	00186	C.4.1.5	--	--	--
			02641	00187	C.4.1.5.3	--	--	--
			02641	00188	C.4.1.5.3	--	--	--
			02641	00189	C.4.1.5.3	--	--	--

G.9-127

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02641	00190	C.4.1.5.3	--	--	--
			02641	00191	C.4.1.5.3	--	--	--
			02641	00192	C.4.1.5.3	--	--	--
			02641	00193	C.4.1.5.3	--	--	--
			02641	00194	C.4.1.5.3	--	--	--
			02641	00195	C.4.1.5.3	--	--	--
			02641	00196	C.4.1.5.3	--	--	--
			02641	00197	C.7.4.3	--	--	--
			02641	00198	C.4.1.5	--	--	--
			02641	00199	C.7.4	--	--	--
			02641	00200	C.7.4.4	--	--	--
			02641	00201	C.4.1.5.4	--	--	--
			02641	00202	C.4.1.5.4	--	--	--
			02641	00203	C.4.1.5.4	--	--	--
			02641	00204	C.4.1.5.4	--	--	--
			02641	00205	C.4.1.5.4	--	--	--
			02641	00206	C.7.4.4	--	--	--
			02641	00207	C.4.1.5.4	--	--	--
			02641	00208	C.4.1.5	--	--	--
			02641	00209	C.4.1.5	--	--	--
			02641	00210	C.4.1.5.4	--	--	--
			02641	00211	C.4.1.5.4	--	--	--
			02641	00212	C.4.1.5.4	--	--	--
			02641	00213	C.4.1.5.4	--	--	--
			02641	00214	C.3.4.3	--	--	--
			02641	00215	C.4.1.5.5	--	--	--
			02641	00216	C.7.4.5	--	--	--
			02641	00217	C.2.1.2	--	--	--
			02641	00218	C.2.1.1	--	--	--
			02641	00219	C.4.2.1	--	--	--
			02641	00220	C.7.4	--	--	--
			02641	00221	C.4.2.2	--	--	--
			02641	00222	C.4.2	--	--	--
			02641	00223	C.4.2.2	--	--	--
			02641	00224	C.4.2.2	--	--	--
			02641	00225	C.4.2.2	--	--	--
			02641	00226	C.4.2.2	--	--	--
			02641	00227	C.4.2.2	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02641	00228	C.4.2	--	--	--
			02641	00230	C.4.2.2	--	--	--
			02641	00231	C.4.2.2	--	--	--
			02641	00232	C.4.2.2	--	--	--
			02641	00233	C.4.2.2	--	--	--
			02641	00234	C.7.1.1	--	--	--
			02641	00235	C.7.1.1	--	--	--
			02641	00236	C.7.1.1	--	--	--
			02641	00237	C.7.1.2	--	--	--
			02641	00238	C.7.1.2	--	--	--
			02641	00239	C.7.1.2	--	--	--
			02641	00240	C.7.1.2	--	--	--
			02641	00241	C.7.1.2	--	--	--
			02641	00242	C.7.1.2	--	--	--
			02641	00243	C.7.1.2	--	--	--
			02641	00244	C.7.1.2	--	--	--
			02641	00245	C.7.1.2	--	--	--
			02641	00246	C.7.1.2	--	--	--
			02641	00247	C.7.1.2	--	--	--
			02641	00248	C.7.1.2	--	--	--
			02641	00249	C.7.1.2	--	--	--
			02641	00250	C.7.1.2	--	--	--
			02641	00251	C.7.1.2	--	--	--
			02641	00252	C.7.1.2	--	--	--
			02641	00253	C.7.1.2	--	--	--
			02641	00254	C.7.1.2	--	--	--
			02641	00255	C.2.1.2	--	--	--
			02641	00256	C.7.3	C.7.4.3	--	--
			02641	00257	C.7.1.2	--	--	--
			02641	00258	C.7.4	--	--	--
			02641	00259	C.7.4	--	--	--
			02641	00260	C.4.3	--	--	--
			02641	00261	C.4.3	--	--	--
			02641	00262	C.4.3	--	--	--
			02641	00263	C.4.3	--	--	--
			02641	00264	C.4.3	--	--	--
			02641	00265	C.4.3	--	--	--
			02641	00266	C.4.3	--	--	--

C.9-129

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02641	00267	C.2.8.3	--	--	--
			02641	00268	C.4.3	--	--	--
			02641	00269	C.2.6.1	--	--	--
			02641	00270	C.2.6	--	--	--
			02641	00271	C.4.3	--	--	--
			02641	00272	C.8.2	--	--	--
			02641	00273	C.7.2	--	--	--
			02641	00274	C.5.2	--	--	--
			02641	00275	C.5.4	--	--	--
			02641	00276	C.8.3	--	--	--
			02641	00277	C.8.3	--	--	--
			02641	00278	C.7.2.1	--	--	--
			02641	00279	C.7.2.2	--	--	--
			02641	00280	C.7.2.2	--	--	--
			02641	00281	C.7.2.2	--	--	--
			02641	00282	C.7.2.3	--	--	--
			02641	00283	C.7.2.3	--	--	--
			02641	00284	C.7.2.3	--	--	--
			02641	00285	C.7.2.3	--	--	--
			02641	00286	C.7.2.3	--	--	--
			02641	00287	C.7.2.7	--	--	--
			02641	00288	C.7.2.7	--	--	--
			02641	00289	C.3.4.4	--	--	--
			02641	00290	C.2.4.1	--	--	--
			02641	00291	C.7.3	--	--	--
			02641	00292	C.7.3	--	--	--
			02641	00293	C.7.3	--	--	--
			02641	00294	C.7.3	--	--	--
			02641	00295	C.7.3	--	--	--
			02641	00296	C.7.3	--	--	--
			02641	00297	C.7.3	--	--	--
			02641	00298	C.7.3	--	--	--
			02641	00299	C.7.3	--	--	--
			02641	00300	C.7.3	--	--	--
			02641	00301	C.7.3	--	--	--
			02641	00302	C.7.3	--	--	--
			02641	00303	C.7.3	--	--	--
			02641	00304	C.2.4.1	--	--	--

C.9-130

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02641	00305	C.7.3	--	--	--
			02641	00306	C.7.3	--	--	--
			02641	00307	C.5.7	--	--	--
			02641	00308	C.2.4.1	C.7.3	--	--
			02641	00309	C.2.6.1	--	--	--
			02641	00310	C.7.3	--	--	--
			02641	00311	C.2.4.1	C.7.3	--	--
			02641	00312	C.2.4.1	--	--	--
			02641	00313	C.7.3	--	--	--
			02641	00314	C.2.4.1	--	--	--
			02641	00315	C.2.4.1	--	--	--
			02641	00316	C.2.4.1	--	--	--
			02641	00317	C.2.4.1	--	--	--
			02641	00318	C.2.4.1	--	--	--
			02641	00319	C.2.4.1	--	--	--
			02641	00320	C.2.4.1	--	--	--
			02641	00321	C.2.6.1	--	--	--
			02641	00322	C.2.4.1	C.7.3	--	--
			02641	00323	C.2.4.1	--	--	--
			02641	00324	C.7.4	--	--	--
			02641	00325	C.4.3	--	--	--
			02641	00326	C.7.4	--	--	--
			02641	00327	C.7.4.2	--	--	--
			02641	00328	C.7.4.2	--	--	--
			02641	00329	C.4.3	--	--	--
			02641	00330	C.4.3	--	--	--
			02641	00331	C.2.7	--	--	--
			02641	00332	C.2.7	--	--	--
			02641	00333	C.2.7	--	--	--
			02641	00334	C.4.3	--	--	--
			02641	00335	C.3.4.2.2	--	--	--
			02641	00336	C.7.4.1	--	--	--
			02641	00337	C.7.4.1	--	--	--
			02641	00338	C.7.4.2	--	--	--
			02641	00339	C.7.4.2	--	--	--
			02641	00340	C.7.4.2	--	--	--
			02641	00341	C.7.4.2	--	--	--
			02641	00345	C.7.4.2	--	--	--

C.9-131

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02641	00346	C.4.1.3.1	--	--	--
			02641	00347	C.4.1.3.1	--	--	--
			02641	00348	C.7.4.2	--	--	--
			02641	00349	C.4.1.3.1	--	--	--
			02641	00350	C.7.4.2	--	--	--
			02641	00351	C.7.4.2	--	--	--
			02641	00352	C.7.4.2	--	--	--
			02641	00353	C.7.4.3	--	--	--
			02641	00354	C.7.4.2	--	--	--
			02641	00355	C.7.4.1	--	--	--
			02641	00356	C.7.4.3	--	--	--
			02641	00357	C.4.1.5.3	--	--	--
			02641	00358	C.7.4.3	--	--	--
			02641	00359	C.7.4.3	--	--	--
			02641	00360	C.7.4.3	--	--	--
			02641	00361	C.7.4.3	--	--	--
			02641	00362	C.7.4.3	--	--	--
			02641	00363	C.7.4.3	--	--	--
			02641	00364	C.7.4.3	--	--	--
			02641	00365	C.7.4.3	--	--	--
			02641	00366	C.7.4.3	--	--	--
			02641	00367	C.7.4.3	--	--	--
			02641	00368	C.7.4.3	--	--	--
			02641	00369	C.7.4.3	--	--	--
			02641	00370	C.7.4.3	--	--	--
			02641	00371	C.7.4.3	--	--	--
			02641	00372	C.7.4.3	--	--	--
			02641	00373	C.7.4.3	--	--	--
			02641	00374	C.7.4.4	--	--	--
			02641	00375	C.7.4.4	--	--	--
			02641	00376	C.7.4.4	--	--	--
			02641	00377	C.7.4.4	--	--	--
			02641	00378	C.7.4.4	--	--	--
			02641	00379	C.7.4.4	--	--	--
			02641	00380	C.7.4.4	--	--	--
			02641	00381	C.7.4	--	--	--
			02641	00382	C.7.4.4	--	--	--
			02641	00383	C.7.4.4	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02641	00384	C.7.4.4	--	--	--
			02641	00385	C.7.4.4	--	--	--
			02641	00386	C.7.4.5	--	--	--
			02641	00387	C.7.4.5	--	--	--
			02641	00388	C.7.4.5	--	--	--
			02641	00389	C.7.4.5	--	--	--
			02641	00390	C.7.4.5	--	--	--
			02641	00391	C.7.4.5	--	--	--
			02641	00392	C.3.7	--	--	--
			02641	00393	C.5.9	--	--	--
			02641	00394	C.5.9	--	--	--
			02641	00395	C.5.9	--	--	--
			02641	00396	C.5.9	--	--	--
			02641	00397	C.6.1	--	--	--
			02641	00398	C.6.2	--	--	--
			02641	00399	C.6.2	--	--	--
			02641	00400	C.6.2	--	--	--
			02641	00401	C.6.2	--	--	--
			02641	00402	C.6.4	--	--	--
			02641	00403	C.6.4	--	--	--
			02641	00404	C.6.4	--	--	--
			02641	00405	C.6.4	--	--	--
			02641	00406	C.7.2	--	--	--
			02641	00407	C.7.2	--	--	--
			02641	00408	C.7.4	--	--	--
			02641	00409	C.7.4	--	--	--
			02641	00410	C.7.4	--	--	--
			02641	00411	C.7.4	--	--	--
			02641	00412	C.7.4	--	--	--
			02641	00413	C.7.4	--	--	--
			02641	00414	C.7.4	--	--	--
			02641	00415	C.7.4	--	--	--
			02641	00416	C.7.4	--	--	--
			02641	00417	C.7.4	--	--	--
			02641	00418	C.7.4	--	--	--
			02641	00419	C.7.4	--	--	--
			02641	00420	C.7.4	--	--	--
			02641	00421	C.7.4	--	--	--

G.9-133

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada</u> (continued)								
			02641	00422	C.7.4	--	--	--
			02641	00423	C.7.4	--	--	--
			02641	00424	C.7.4	--	--	--
			02641	00425	C.7.4	--	--	--
			02641	00426	C.7.4	--	--	--
			02641	00427	C.2.4.1	C.7.3	--	--
			02641	00428	C.7.3	--	--	--
			02641	00429	C.2.4.1	C.7.3	--	--
			02641	00430	C.2.4.1	--	--	--
			02641	00431	C.2.4.1	C.7.3	--	--
			02641	00432	C.2.4.1	--	--	--
			02641	00433	C.2.4.1	--	--	--
			02641	00434	C.2.4.1	--	--	--
			02641	00435	C.7.3	--	--	--
			02641	00436	C.7.3	--	--	--
			02641	00437	C.7.3	--	--	--
			02641	00438	C.7.3	--	--	--
			02641	00440	C.7.3	--	--	--
			02641	00441	C.2.4.1	C.7.3	--	--
			02641	00442	C.2.4.1	--	--	--
			02641	00442A	C.7.3	--	--	--
			02641	00442B	C.7.3	--	--	--
			02641	00443	C.7.3	--	--	--
			02641	00444	C.7.3	--	--	--
			02641	00445	C.7.3	--	--	--
			02641	00446	C.7.3	--	--	--
			02641	00447	C.7.3	--	--	--
			02641	00448	C.7.3	--	--	--
			02641	00449	C.6.5	--	--	--
			02641	00450	C.6.5	--	--	--
			02641	00451	C.6.5	--	--	--
			02641	00452	C.6.5	--	--	--
			02641	00453	C.6.5	--	--	--
			02641	00454	C.7.5	--	--	--
			02641	00455	C.5.1	--	--	--
			02641	00456	C.5.1	--	--	--
			02641	00457	C.5.1	--	--	--
			02641	00458	C.5.1	--	--	--

C.9-134

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02641	00459	C.5.1	--	--	--
			02641	00460	C.5.1	--	--	--
			02641	00461	C.5.1	--	--	--
			02641	00462	C.5.1	--	--	--
			02641	00463	C.5.1	--	--	--
			02641	00464	C.5.1	--	--	--
			02641	00465	C.5.1	--	--	--
			02641	00466	C.5.2	--	--	--
			02641	00467	C.5.1	--	--	--
			02641	00468	C.5.1	--	--	--
			02641	00469	C.5.1	--	--	--
			02641	00470	C.5.1	--	--	--
			02641	00471	C.5.2	--	--	--
			02641	00472	C.5.2	--	--	--
			02641	00473	C.5.2	--	--	--
			02641	00474	C.5.2	--	--	--
			02641	00475	C.5.2	--	--	--
			02641	00476	C.5.2	--	--	--
			02641	00478	C.5.2	--	--	--
			02641	00479	C.5.2	--	--	--
			02641	00480	C.5.2	--	--	--
			02641	00481	C.5.3	--	--	--
			02641	00482	C.5.3	--	--	--
			02641	00483	C.5.3	--	--	--
			02641	00484	C.5.3	--	--	--
			02641	00485	C.5.3	--	--	--
			02641	00486	C.5.3	--	--	--
			02641	00487	C.5.3	--	--	--
			02641	00488	C.5.3	--	--	--
			02641	00489	C.5.3	--	--	--
			02641	00490	C.5.3	--	--	--
			02641	00491	C.5.3	--	--	--
			02641	00492	C.5.3	--	--	--
			02641	00493	C.5.4	--	--	--
			02641	00494	C.5.4	--	--	--
			02641	00495	C.5.4	--	--	--
			02641	00496	C.5.4	--	--	--
			02641	00497	C.5.4	--	--	--

C-9-135

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02641	00498	C.5.4	--	--	--
			02641	00499	C.5.4	--	--	--
			02641	00500	C.5.5	--	--	--
			02641	00501	C.5.7	--	--	--
			02641	00502	C.5.7	--	--	--
			02641	00503	C.5.7	--	--	--
			02641	00504	C.5.7	--	--	--
			02641	00505	C.5.7	--	--	--
			02641	00506	C.5.7	--	--	--
			02641	00507	C.5.7	--	--	--
			02641	00508	C.5.7	--	--	--
			02641	00509	C.5.7	--	--	--
			02641	00510	C.5.7	--	--	--
			02641	00511	C.5.7	--	--	--
			02641	00512	C.5.7	--	--	--
			02641	00513	C.5.7	--	--	--
			02641	00514	C.5.7	--	--	--
			02641	00515	C.5.7	--	--	--
			02641	00516	C.5.7	--	--	--
			02641	00517	C.5.7	--	--	--
			02641	00518	C.5.7	--	--	--
			02641	00519	C.5.7	--	--	--
			02641	00520	C.6.4	--	--	--
			02641	00521	C.5.8	--	--	--
			02641	00522	C.5.8	--	--	--
			02641	00523	C.5.8	--	--	--
			02641	00524	C.5.8	--	--	--
			02641	00525	C.5.8	--	--	--
			02641	00526	C.5.10	--	--	--
			02641	00527	C.5.10	--	--	--
			02641	00528	C.5.10	--	--	--
			02641	00529	C.5.10	--	--	--
			02641	00530	C.5.10	--	--	--
			02641	00531	C.8.1	--	--	--
			02641	00532	C.8.1	--	--	--
			02641	00533	C.8.1	--	--	--
			02641	00534	C.8.2	--	--	--
			02641	00535	C.8.2	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02641	00536	C.8.2	--	--	--
			02641	00537	C.8.2	--	--	--
			02641	00538	C.8.4	--	--	--
			02641	00539	C.8.4	--	--	--
			02641	00540	C.8.4	--	--	--
			02641	00541	C.8.4	--	--	--
			02641	00542	C.6.5	--	--	--
			02641	00543	C.5.11	--	--	--
			02641	00544	C.5.11	--	--	--
			02641	00545	C.5.11	--	--	--
			02641	00546	C.5.11	--	--	--
			02641	00547	C.5.11	--	--	--
			02641	00548	C.5.11	--	--	--
			02641	00549	C.5.11	--	--	--
			02641	00550	C.5.4	--	--	--
			02641	00551	C.5.4	--	--	--
			02641	00552	C.5.11	--	--	--
			02641	00553	C.3.4.3	--	--	--
			02641	00554	C.3.4.3	--	--	--
			02641	00555	C.3.4.3	--	--	--
			02641	00556	C.3.4.3	--	--	--
			02641	00557	C.3.4.3	--	--	--
			02641	00558	C.3.4.3	--	--	--
			02641	00559	C.3.4.3	--	--	--
			02641	00560	C.3.4.1	--	--	--
			02641	00561	C.3.1.3	--	--	--
			02641	00562	C.3.4.1	--	--	--
			02641	00563	C.2.8.3	--	--	--
			02641	00564	C.3.1.3	--	--	--
			02641	00565	C.3.4.1	--	--	--
			02641	00566	C.3.4.1	--	--	--
			02641	00567	C.3.1.1	C.3.4.1	--	--
			02641	00568	C.3.4.1	--	--	--
			02641	00569	C.3.1.3	--	--	--
			02641	00570	C.3.1.3	--	--	--
			02641	00571	C.3.4.1	--	--	--
			02641	00572	C.3.4.1	--	--	--
			02641	00573	C.3.4.1	--	--	--

G-9-137

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			02641	00574	C.3.1.3	--	--	--
			02641	00575	C.3.4.1	--	--	--
			02641	00576	C.3.4.1	--	--	--
			02641	00577	C.3.4.1	--	--	--
			02641	00578	C.3.4.1	--	--	--
			02641	00579	C.3.4.1	--	--	--
			02641	00580	C.3.1.3	--	--	--
			02641	00581	C.3.1.3	--	--	--
			02641	00582	C.3.1.3	--	--	--
			02641	00583	C.3.1.3	--	--	--
			02641	00584	C.3.1.3	--	--	--
			02641	00585	C.3.1.1	--	--	--
			02641	00586	C.3.1.1	--	--	--
			02641	00587	C.3.1.3	--	--	--
			02641	00588	C.3.4.2.2	C.3.1.3	--	--
			02641	00589	C.3.4.2.2	C.3.1.3	--	--
			02641	00590	C.3.4.2.2	C.4.1.2.3	--	--
			02641	00591	C.3.4.2.2	C.4.1.2.3	--	--
			02641	00592	C.3.4.2.2	C.4.1.2.3	--	--
			02641	00593	C.3.4.2.2	--	--	--
			02641	00594	C.3.4.2.2	C.3.4.3	--	--
			02641	00595	C.3.4.3	--	--	--
			02641	00596	C.3.4.3	--	--	--
			02641	00597	C.3.4.3	--	--	--
			02641	00598	C.3.4.2.2	--	--	--
			02641	00599	C.3.4.2.2	--	--	--
			02641	00600	C.3.4.2.2	--	--	--
			02641	00601	C.3.4.2.2	--	--	--
			02641	00602	C.3.1.3	--	--	--
			02641	00603	C.3.4.2.3	--	--	--
			02641	00604	C.3.1.3	--	--	--
			02641	00605	C.3.4.2.3	C.3.1.3	--	--
			02641	00606	C.3.4.2.3	--	--	--
			02641	00607	C.3.4.2.3	--	--	--
			02641	00608	C.3.4.2.3	--	--	--
			02641	00609	C.3.4.2.3	--	--	--
			02641	00610	C.3.4.2.3	--	--	--
			02641	00611	C.3.4.2.3	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			02641	00612	C.3.4.2.3	--	--	--
			02641	00613	C.3.4.2.3	--	--	--
			02641	00614	C.3.4.2.3	--	--	--
			02641	00615	C.3.4.3	--	--	--
			02641	00616	C.3.4.3	--	--	--
			02641	00617	C.3.4.3	--	--	--
			02641	00618	C.3.4.3	--	--	--
			02641	00619	C.3.4.3	--	--	--
			02641	00620	C.3.4.3	--	--	--
			02641	00621	C.3.4.3	--	--	--
			02641	00622	C.3.4.3	--	--	--
			02641	00623	C.2.4.1	--	--	--
			02641	00624	C.2.4.1	--	--	--
			02641	00625	C.2.4.1	--	--	--
			02641	00626	C.2.4.1	--	--	--
			02641	00627	C.2.4.1	--	--	--
			02641	00628	C.2.4.1	--	--	--
			02641	00629	C.2.4.1	--	--	--
			02641	00630	C.2.4.1	--	--	--
			02641	00631	C.2.4.1	--	--	--
			02641	00632	C.2.4.1	--	--	--
			02641	00633	C.2.4.1	--	--	--
			02641	00634	C.2.4.1	--	--	--
			02641	00635	C.2.4.1	--	--	--
	Spencer, George	Union of Concerned Scientists	01410	00002	C.3.4.4	--	--	--
	Strickland, Rose		01463	00001	C.3.1.2	--	--	--
			01463	00002	C.3.1.2	--	--	--
			01463	00003	C.2.8.1	--	--	--
			01463	00004	C.3.1.2	--	--	--
			01463	00005	C.3.1.2	--	--	--
			01463	00006	C.3.1.2	--	--	--
	Strickland, Rose	Sierra Club	01316	00001	C.3.1.3	--	--	--
			01316	00002	C.4.1.2.2	--	--	--
			01316	00003	C.2.4.1	--	--	--
			01316	00004	C.7.2.1	--	--	--
			01316	00005	C.3.1.3	--	--	--
			01316	00006	C.2.1.1	--	--	--
	Tanne, Sydney		01424	00001	C.5.11	--	--	--

C.9-139

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
			01424	00002	C.4.3	--	--	--
			01424	00003	C.7.4	--	--	--
	Tanner, K.		01424	00004	C.2.1.1	--	--	--
			01475	00001	C.5.7	--	--	--
			01475	00002	C.7.2	--	--	--
			01475	00003	C.2.4.1	--	--	--
			01475	00004	C.7.4.2	--	--	--
			01475	00005	C.3.4.4	--	--	--
			01475	00006	C.2.8.1	--	--	--
			01475	00007	C.3.4.4	--	--	--
	Terlizzi, Loretta		00425	00001	C.3.4.4	--	--	--
			00425	00002	C.2.8	--	--	--
	Terlizzi, Loretta		00519	00001	C.3.4.4	--	--	--
			00519	00002	C.3.4.4	--	--	--
			00519	00003	C.2.8.2	--	--	--
			00519	00004	C.3.4.4	--	--	--
	Thomason, Jack	City of Las Vegas	02645	00001	C.2.4.1	--	--	--
			02645	00002	C.2.4.1	--	--	--
			02645	00003	C.2.4.1	--	--	--
			02645	00004	C.7.4.2	--	--	--
			02645	00005	C.7.4	--	--	--
			02645	00006	C.7.4.2	--	--	--
			02645	00007	C.2.3.1	--	--	--
			02645	00008	C.2.4.1	--	--	--
			02645	00009	C.2.4.1	--	--	--
			02645	00010	C.2.4.1	--	--	--
			02645	00011	C.7.4	--	--	--
			02645	00012	C.7.4.2	--	--	--
			02645	00013	C.7.2	--	--	--
			02645	00014	C.2.4.1	--	--	--
			02645	00015	C.2.4.1	--	--	--
			02645	00016	C.2.4.1	--	--	--
	Treichel, J.		01417	00001	C.3.4.4	--	--	--
			01417	00002	C.3.1.2	--	--	--
			01417	00003	C.4.1.3.7	--	--	--
			01417	00004	C.3.4.4	--	--	--
			01417	00005	C.3.4.4	--	--	--
			01417	00006	C.4.1.3.7	--	--	--

C.9-140

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			01417	00007	C.7.3	--	--	--
			01417	00008	C.2.5.2	C.6.4	--	--
	Trinko, Mark		01447	00001	C.3.1.2	--	--	--
	Twedt, P.		01479	00001	C.7.3	--	--	--
			01479	00002	C.2.1.1	--	--	--
			01479	00003	C.2.1.1	--	--	--
			01479	00004	C.2.1.1	--	--	--
			01479	00005	C.2.1.2	--	--	--
			01479	00006	C.2.1.2	--	--	--
	Van Neuren, Heimi		01413	00001	C.2.7	--	--	--
			01413	00002	C.2.4.1	--	--	--
			01413	00003	C.2.4.1	--	--	--
			01413	00004	C.3.1.2	--	--	--
			01413	00005	C.3.4.4	--	--	--
	Vincent, Bill	Sthrn Coordination for Cit Alert	01418	00001	C.2.4.1	C.7.3	--	--
			01418	00002	C.2.4.1	C.7.3	--	--
			01418	00003	C.2.4.1	C.7.3	--	--
			01418	00004	C.2.4.1	C.7.3	--	--
			01418	00005	C.5.7	--	--	--
			01418	00006	C.5.1	--	--	--
			01418	00007	C.7.2.1	--	--	--
	Warren, Liz	Sthrn. NV Historical Society	01446	00001	C.4.1.3.6	--	--	--
			01446	00002	C.4.1.3.6	--	--	--
			01446	00003	C.4.1.3.6	--	--	--
			01446	00004	C.4.3	--	--	--
			01446	00005	C.7.4.2	--	--	--
	Wasson, G.	Shoshone Indians	01469	00001	C.4.1.1	--	--	--
			01469	00002	C.4.1.1	--	--	--
			01469	00003	C.3.1.3	--	--	--
			01469	00004	C.2.3.3	--	--	--
			01469	00005	C.3.1.3	--	--	--
			01469	00006	C.3.1.2	--	--	--
			01469	00007	C.2.8.1	--	--	--
	Watson, C.		01467	00001	C.7.2.1	--	--	--
			01467	00002	C.7.2.2	--	--	--
			01467	00003	C.5.7	--	--	--
			01467	00004	C.2.4.1	--	--	--
			01467	00005	C.3.1.2	--	--	--

C.9-1A1

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Nevada (continued)</u>								
	Weiss, Tom		01467	00006	C.7.2.2	--	--	--
	Williams, A.		01490	00001	C.2.1.1	--	--	--
			01472	00001	C.2.8	--	--	--
			01472	00002	C.6.4	--	--	--
	Wilson, Robert D.	City of Henderson	01472	00003	C.3.1.2	--	--	--
			02647	00001	C.2.4.1	--	--	--
			02647	00002	C.2.4.1	--	--	--
			02647	00003	C.2.4.1	--	--	--
			02647	00004	C.2.4.1	--	--	--
			02647	00005	C.2.4.1	--	--	--
			02647	00006	C.2.4.1	--	--	--
			02647	00007	C.2.4.1	--	--	--
			02647	00008	C.7.4.2	--	--	--
			02647	00009	C.7.4.2	--	--	--
			02647	00010	C.7.4.2	--	--	--
			02647	00011	C.7.4.2	--	--	--
			02647	00012	C.7.4.2	--	--	--
	Wyman, Richard	Civil & Mech Engineering	01423	00001	C.3.4.4	--	--	--
	Zorn, Ann	League of Women Voters of Nevada	01119	00001	C.7.3	--	--	--
			01119	00002	C.7.3	--	--	--
			01119	00003	C.2.1.1	--	--	--
			01119	00004	C.2.1.1	--	--	--
			01119	00005	C.2.1.5	--	--	--
			01119	00006	C.2.4.1	--	--	--
			01119	00007	C.2.4.1	--	--	--
			01119	00008	C.2.4.1	--	--	--
			01119	00009	C.2.4.1	--	--	--
			01119	00010	C.2.4.1	--	--	--
			01119	00011	C.2.4.1	--	--	--
			01119	00012	C.7.3	--	--	--
			01119	00014	C.7.4.2	--	--	--
			01119	00015	C.7.4	--	--	--
			01119	00016	C.3.3	--	--	--
			01119	00017	C.3.4.3	--	--	--
			01119	00018	C.2.1.1	--	--	--
			01119	00019	C.2.7	--	--	--
	Zorn, Ann	NV League of Women Voters	01419	00001	C.2.1.1	--	--	--
			01419	00002	C.3.4.3	--	--	--

C.9-142

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Nevada (continued)								
			01419	00003	C.4.2	--	--	--
			01419	00004	C.7.4	--	--	--
			01419	00005	C.7.2.1	--	--	--
			01419	00006	C.2.4.1	C.7.3	--	--
			01419	00007	C.2.8.3	C.7.3	--	--
			01419	00008	C.2.4.1	C.7.3	--	--
			01419	00009	C.7.4.3	--	--	--
			01419	00010	C.7.3	--	--	--
			01419	00011	C.2.4.1	--	--	--
			01419	00012	C.7.3	--	--	--
			01419	00013	C.7.3	--	--	--
			01419	00014	C.2.6	--	--	--
			01419	00015	C.2.4.1	--	--	--
			01419	00016	C.4.3	--	--	--
			01419	00017	C.2.1.2	C.7.4.2	C.7.4.5	--
New Mexico								
	Brown, Philip		02702	00001	C.3.4.4	--	--	--
			02702	00002	C.3.1.2	--	--	--
			02702	00003	C.3.4.4	--	--	--
			02702	00004	C.2.1.1	--	--	--
	Covington, Margo		00160	00001	C.3.1.2	--	--	--
	Jones, Dan	Rio Grande Chapter Sierra Club	00440	00003	C.3.1.2	--	--	--
	Kosel, Mark E.		00194	00001	C.3.4.4	--	--	--
	Mabery, Ken and Marilyn V.		00404	00001	C.3.4.4	--	--	--
	Olivo, R.N., B.S.N., Noemi	The College of Santa Fe	02074	00001	C.3.1.2	--	--	--
	Ranno, Dr. Russel A.		00164	00001	C.3.4.4	--	--	--
New York								
	Cardlin, Nancy		00093	00001	C.3.4.4	--	--	--
			00093	00003	C.3.4.4	--	--	--
	Concra, Jr., Louis M.	NY State Dept. Envir. Conserv.	01570	00001	C.2.4.1	--	--	--
			01570	00002	C.2.4.1	--	--	--
			01570	00003	C.2.4.1	--	--	--
			01570	00004	C.2.4.1	--	--	--
			01570	00005	C.2.4.1	--	--	--

C.9-143

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>New York (continued)</u>								
			01570	00006	C.2.4.1	--	--	--
			01570	00007	C.2.4.1	--	--	--
			01570	00008	C.2.4.1	--	--	--
			01570	00009	C.2.4.1	--	--	--
			01570	00010	C.2.4.1	--	--	--
	Constant, Robert L.	Donaldson, Lufkin & Jenrette	01583	00001	C.3.1.2	--	--	--
	Copeland, Dr. Robert L.		00065	00001	C.3.1.2	--	--	--
	Crocco, Evelyn A.		00459	00001	C.3.4.4	--	--	--
	Diserlo, Matthew J.	Donaldson, Lufkin & Jenrette	01571	00001	C.3.1.2	--	--	--
	Hale, Mary		00355	00001	C.3.1.2	--	--	--
	Hazel, James		00148	00001	C.3.1.2	--	--	--
	Le Roy, Mary		00112	00001	C.3.4.4	--	--	--
			00112	00003	C.3.4.4	--	--	--
	Norr, Carol		00305	00001	C.3.4.4	--	--	--
	Simon, Davis		01101	00001	C.3.4.4	--	--	--
	Wakefield, D. Audrey		01285	00004	C.3.4.4	--	--	--
	Walker, Jean		01551	00002	C.3.1.2	--	--	--
	Walker, Franklin V.		02076	00001	C.3.1.2	--	--	--
			02076	00002	C.3.1.2	--	--	--
	Werzinski, Joseph		02113	00001	C.2.1.1	--	--	--
			02113	00002	C.2.4.1	--	--	--
			02113	00003	C.7.2	--	--	--
			02113	00004	C.7.4	--	--	--
<u>Ohio</u>								
	Clark, Judith		02608	00001	C.3.1.2	--	--	--
			02608	00002	C.3.1.2	--	--	--
			02608	00003	C.2.8.1	--	--	--
	Sauer, Rodney		01186	00002	C.2.3	--	--	--
	Walter, Laura		00207	00001	C.3.4.4	--	--	--
			00207	00003	C.2.3.2	--	--	--
<u>Oklahoma</u>								
	Dalton, Jr., Andrew L.	Attorney at Law	00084	00001	C.3.4.4	--	--	--

C.9-14A

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Oregon								
	Adams, J. Ross & Lois H.		00543	00001	C.3.4.4	--	--	--
	Amara, Mark & Margaret		01128	00001	C.2.3.3	--	--	--
			01128	00002	C.2.8.3	--	--	--
			01128	00003	C.2.3.1	--	--	--
			01128	00005	C.2.8.3	--	--	--
			01128	00012	C.2.4.1	--	--	--
			01128	00013	C.3.1.2	--	--	--
			01128	00015	C.2.2	--	--	--
			01128	00017	C.2.4.1	--	--	--
			01128	00018	C.3.1.2	--	--	--
			01128	00019	C.2.4.1	--	--	--
	Anderson, Harvard		02441	00002	C.3.4.4	--	--	--
			02441	00004	C.3.4.4	--	--	--
			02441	00005	C.3.4.4	--	--	--
			02441	00006	C.3.4.4	--	--	--
	Anderson, Judith		02475	00003	C.2.10	--	--	--
			02475	00004	C.3.4.4	--	--	--
			02475	00005	C.2.3.1	--	--	--
			02475	00006	C.2.3.1	--	--	--
			02475	00007	C.2.1.1	--	--	--
	Andre, Mary Ellen		01163	00002	C.2.3.3	--	--	--
	Anonymous	KGW-TV	02606	00001	C.2.3.3	--	--	--
			02606	00002	C.2.1.2	--	--	--
	Arum, John		02457	00001	C.3.4.4	--	--	--
			02457	00002	C.2.7	--	--	--
			02457	00003	C.3.1.1	--	--	--
			02457	00004	C.2.3.1	--	--	--
			02457	00005	C.3.1.2	--	--	--
			02457	00006	C.3.1.2	--	--	--
			02457	00010	C.2.4.1	--	--	--
			02457	00011	C.3.4.4	--	--	--
	Arum, John	Forelaws on Board	02694	00002A	C.2.4.1	--	--	--
			02694	00002B	C.2.6.1	--	--	--
	Ashburn, Dan		02446	00001	C.3.4.4	--	--	--
			02446	00002	C.2.1.1	--	--	--
			02446	00003	C.2.8.1	--	--	--
	Ashburn, Daniel	WSSG	01363	00001	C.2.6.3	--	--	--
			01363	00002	C.2.6.3	--	--	--

C.9-145

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Oregon</u> (continued)								
			01363	00003	C.3.1.2	--	--	--
			01363	00004	C.3.4	--	--	--
	Bailey, Don W.		00476	00005	C.3.4.4	--	--	--
	Barber, William		01592	00001	C.3.4.4	--	--	--
	Barker, Rev., Catherine A.		01554	00001	C.3.4.4	--	--	--
	Bauman, Rick		02469	00001	C.2.1.2	--	--	--
			02469	00002	C.2.1.2	--	--	--
			02469	00003	C.2.3.3	--	--	--
	Bauman, Rick	House of Rep Oregon Legis Assemb	01248	00001	C.2.1.2	--	--	--
			01248	00001A	C.2.1.2	--	--	--
			01248	00001B	C.2.1.2	--	--	--
			01248	00002	C.3.1.2	--	--	--
			01248	00009	C.2.4.1	--	--	--
	Bell, Charles		02493	00001	C.2.1.1	--	--	--
			02493	00003	C.3.1.1	--	--	--
			02493	00004	C.3.4.4	--	--	--
			02493	00005	C.2.4.1	--	--	--
			02493	00006	C.2.6.1	--	--	--
			02493	00007	C.2.8.1	--	--	--
			02493	00009	C.3.4.4	--	--	--
			02493	00010	C.2.1.1	--	--	--
			02493	00011	C.2.1.2	--	--	--
			02493	00012	C.3.4.4	--	--	--
	Bell, Charles F.	Fellowship of Reconciliation	02493	00013	C.2.1.1	--	--	--
			01305	00001	C.2.3.3	--	--	--
			01305	00003B	C.2.3	--	--	--
			01305	00004	C.2.4.1	--	--	--
			01305	00005	C.2.3	--	--	--
			01305	00008	C.2.4.1	--	--	--
	Belsey, Dick		01305	00009	C.3.1.2	--	--	--
			02473	00004	C.2.3.1	--	--	--
	Berry, Diane	City of Echo	02473	00005	C.2.3.2	--	--	--
			01319	00001	C.2.3.3	--	--	--
			01319	00003	C.2.4.1	C.7.3	--	--
			01319	00004	C.3.1.2	--	--	--
	Bickett, Gary		01280	00001	C.2.3.1	--	--	--
			01280	00002	C.2.1.1	--	--	--
			01280	00003	C.3.4.4	--	--	--

C.9-146

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Oregon (continued)								
			01280	00005	C.2.4.3	--	--	--
			01280	00011	C.2.1.2	--	--	--
			01280	00012	C.2.8.3	--	--	--
			01280	00015	C.2.1.1	--	--	--
	Bickett, Gary		01320	00002	C.2.3.1	--	--	--
			01320	00003	C.2.1.1	--	--	--
			01320	00004	C.3.4.4	--	--	--
			01320	00005	C.3.1.2	--	--	--
			01320	00008	C.2.4.1	--	--	--
			01320	00010	C.2.1.2	--	--	--
			01320	00011	C.2.8.3	--	--	--
			01320	00012	C.2.8.2	--	--	--
			01320	00015	C.2.1.1	--	--	--
			01320	00221	C.2.7	--	--	--
	Bleckman, Laurie		02498	00001	C.2.4.1	--	--	--
			02498	00002	C.3.4.4	--	--	--
	Boon, Jayna A.		01099	00001	C.3.4.4	--	--	--
			01099	00002	C.3.1.2	--	--	--
	Borge, John		00544	00001	C.3.4.4	--	--	--
			00544	00002	C.3.1.2	C.7.3	--	--
	Bradbury, Senator Bill		02442	00004	C.3.2	--	--	--
			02442	00012	C.3.4.4	--	--	--
			02442	00013	C.3.4.4	--	--	--
			02442	00014	C.3.1.2	--	--	--
	Broadwell, Jo	Students for Nuclear Awareness	01359	00003	C.3.1.1	--	--	--
			01359	00005	C.2.8.1	--	--	--
			01359	00006A	C.2.4.1	--	--	--
			01359	00006B	C.3.4.4	--	--	--
	Bunch, Ron & Margaret		02085	00001	C.3.1.2	--	--	--
			02085	00002	C.3.1.2	--	--	--
			02085	00003	C.3.1.2	--	--	--
			02085	00004	C.3.4.4	--	--	--
			02085	00005	C.3.1.2	--	--	--
	Carl, Lisa A.		01135	00001	C.2.3.3	--	--	--
			01135	00005	C.3.4.4	--	--	--
			01135	00006	C.3.1.2	--	--	--
	Clagett, Bill		01241	00001	C.2.1.1	--	--	--
			01241	00002	C.2.1.1	--	--	--

C.9-147

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Oregon</u> (continued)								
			01241	00003	C.2.5.2	--	--	--
			01241	00004	C.2.5.2	--	--	--
			01241	00005	C.2.5.2	--	--	--
	Coulter, Karen L.		01354	00001	C.3.4.4	--	--	--
			01354	00002	C.2.3.3	--	--	--
			01354	00003	C.3.1.2	--	--	--
			01354	00004	C.3.1.2	--	--	--
			01354	00005	C.3.4.4	--	--	--
			01354	00006	C.2.3.1	--	--	--
			01354	00011	C.2.4.1	--	--	--
			01354	00013	C.2.1.2	--	--	--
	Crenshaw, Terry		01279	00001	C.3.4.4	--	--	--
	Dave, Arita		02459	00001	C.3.4.4	--	--	--
			02459	00002	C.3.4.4	--	--	--
	Davies, Carol		02474	00002	C.2.3.1	--	--	--
			02474	00004	C.2.8.2	--	--	--
	Davis, Mark		00469	00001	C.2.7	--	--	--
			00469	00002	C.2.8	--	--	--
			00469	00003A	C.2.4.3	--	--	--
			00469	00003B	C.2.8.3	--	--	--
			00469	00005	C.2.2	--	--	--
			00469	00008	C.3.1.2	--	--	--
			00469	00009	C.3.4.4	--	--	--
	DeIwiche, Laurel A.		00495	00002	C.2.3.3	--	--	--
	Dixon, Bill		02467	00001	C.2.1.2	--	--	--
	Dixon, Bill	Department of Energy	02070	00001	C.2.1.2	--	--	--
			02070	00002	C.2.4.1	--	--	--
			02070	00003	C.2.1.2	--	--	--
			02070	00005	C.2.4.1	--	--	--
			02070	00006	C.2.1.1	--	--	--
			02070	00007	C.2.7	--	--	--
			02070	00010	C.3.4.4	--	--	--
			02070	00013	C.2.8.3	--	--	--
			02070	00030	C.2.5.1	--	--	--
			02070	00040	C.2.4.1	--	--	--
			02070	00041	C.2.4.1	--	--	--
			02070	00042	C.2.4.1	--	--	--
			02070	00043	C.2.4.1	--	--	--

C.9-148

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Oregon (continued)								
			02070	00044	C.2.4.1	--	--	--
			02070	00045	C.2.4.1	--	--	--
			02070	00046	C.2.4.1	--	--	--
			02070	00047	C.2.4.1	--	--	--
			02070	00048	C.2.4.1	--	--	--
			02070	00049	C.2.4.1	--	--	--
			02070	00050	C.2.4.1	--	--	--
			02070	00051	C.2.4.1	--	--	--
			02070	00052	C.2.4.1	--	--	--
			02070	00054	C.2.4.1	--	--	--
			02070	00055	C.2.4.1	--	--	--
			02070	00056	C.2.4.1	--	--	--
			02070	00060	C.6.4	--	--	--
			02070	00062	C.2.4.1	--	--	--
			02070	00064	C.2.4.1	--	--	--
			02070	00073	C.3.4.3	--	--	--
			02070	00074	C.2.4.1	--	--	--
			02070	00075	C.2.4.1	--	--	--
			02070	00076	C.2.4.1	--	--	--
			02070	00077	C.2.4.1	--	--	--
			02070	00078	C.2.4.1	--	--	--
			02070	00079	C.2.4.1	--	--	--
			02070	00080	C.2.4.1	--	--	--
			02070	00081	C.3.4.3	--	--	--
			02070	00082	C.3.1.1	--	--	--
	Dobratz, Ruth Marie		02698	00001	C.2.8.1	--	--	--
			02698	00002	C.2.8.2	--	--	--
			02698	00003	C.3.4.4	--	--	--
			02698	00004	C.3.4.4	--	--	--
			02698	00005	C.2.8.2	--	--	--
			02698	00006	C.2.8.2	--	--	--
	Fawbush, Rep., Wayne		02444	00001	C.2.3.1	--	--	--
			02444	00007	C.3.4.4	--	--	--
	Frank, Lynn		02440	00003	C.2.1.2	--	--	--
			02440	00004	C.2.1.2	--	--	--
	Friedman, Sid		02483	00001	C.3.4.4	--	--	--
			02483	00002	C.3.4.4	--	--	--
			02483	00003	C.3.1.2	--	--	--

647-60

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Oregon</u> (continued)								
			02483	00004	C.3.1.1	--	--	--
			02483	00005	C.2.3.1	--	--	--
			02483	00006	C.2.1.1	--	--	--
			02483	00007	C.2.3.1	--	--	--
			02483	00008	C.2.4.1	--	--	--
			02483	00009	C.2.4.1	--	--	--
			02483	00010	C.2.4.1	--	--	--
	Frison, Theodore	Koinonia Ecumenical Community	01249	00001	C.3.4.4	--	--	--
			01249	00002	C.2.4.1	--	--	--
			01249	00003	C.3.1.2	--	--	--
			01249	00004	C.3.1.2	--	--	--
			01249	00005	C.2.8.2	--	--	--
			01249	00006	C.3.1.2	--	--	--
			01249	00007	C.3.1.2	--	--	--
			01249	00008	C.3.1.2	--	--	--
			01249	00009	C.3.1.2	--	--	--
			01249	00010	C.3.4.4	--	--	--
	Frison, Theodore		01361	00002	C.2.4.1	--	--	--
			01361	00005	C.3.1.2	--	--	--
			01361	00006	C.2.1.2	--	--	--
			01361	00008	C.3.1.2	--	--	--
	Fry, Peter F.		01202	00001	C.3.4.4	--	--	--
			01202	00002	C.3.1.2	--	--	--
			01202	00003	C.2.4.1	--	--	--
			01202	00004	C.2.3	--	--	--
	Gee, Sandra		02485	00002	C.2.8.2	--	--	--
			02485	00004	C.2.1.1	--	--	--
	Germond, Norma Jean		02490	00002	C.2.1.2	--	--	--
			02490	00003	C.2.1.1	--	--	--
			02490	00004	C.2.1.1	--	--	--
			02490	00007	C.2.4.1	--	--	--
			02490	00008	C.2.4.1	--	--	--
	Germond, Norma Jean	Columbia River Task Force	02503	00002	C.2.1.2	--	--	--
			02503	00003	C.2.1.1	--	--	--
			02503	00004	C.2.1.1	--	--	--
			02503	00007	C.2.4.1	--	--	--
			02503	00008	C.2.4.1	--	--	--
	Gilevich, Welsh, Shari, Manning		00619	00001	C.3.1.2	--	--	--

C.9-150

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Oregon (continued)								
			00619	00002	C.3.1.2	--	--	--
			00619	00003	C.2.3.1	--	--	--
			00619	00004	C.2.3.3	--	--	--
			00619	00005	C.2.1.2	--	--	--
			00619	00006	C.2.4.1	--	--	--
			00619	00008	C.2.8.3	--	--	--
			00619	00009	C.2.3.3	--	--	--
	Goldberg, Marshall		02480	00001	C.3.4.4	--	--	--
			02480	00002	C.2.4.1	--	--	--
			02480	00006	C.3.1.2	--	--	--
			02480	00007	C.2.1.2	--	--	--
	Griffith, W. R.		01156	00001	C.3.4.4	--	--	--
	Griffith, Nigel		02477	00001	C.3.4.4	--	--	--
	Hampton, Stephanie		02470	00004	C.2.4.1	--	--	--
			02470	00005	C.3.1.2	--	--	--
			02470	00006	C.2.1.2	--	--	--
	Hampton, Stephanie	Town of Hammond Representative	00676	00001	C.2.4.1	--	--	--
	Harris, Hope		00681	00002	C.2.1.2	--	--	--
	Harris, Hope		02495	00003	C.2.4.1	--	--	--
			02495	00006	C.3.4.4	--	--	--
			02495	00007	C.2.1.2	--	--	--
	Henningsgaard, Mayor Edith	Astoria City Council	02073	00001	C.3.4.4	--	--	--
			02073	00002	C.2.1.2	--	--	--
			02073	00003	C.3.4.4	--	--	--
	Henry, David	WSSG	01365	00001	C.2.1.2	--	--	--
			01365	00002	C.2.1.2	--	--	--
			01365	00003	C.2.1.2	--	--	--
			01365	00004	C.2.4.1	--	--	--
			01365	00005	C.2.4.1	--	--	--
			01365	00006	C.2.4.1	--	--	--
			01365	00007	C.2.4.1	--	--	--
			01365	00008	C.2.4.1	--	--	--
			01365	00009	C.2.4.1	--	--	--
			01365	00010	C.2.4.1	--	--	--
			01365	00011	C.2.4.1	--	--	--
			01365	00012	C.2.4.1	--	--	--
			01365	00013	C.2.1.2	--	--	--
	Herdon/Hill, Co-chair, Ron/Alma	Rainbow Organizing Committee	00521	00001	C.3.1.2	--	--	--

C.9-151

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Oregon (continued)</u>								
			00521	00002	C.2.1.1	--	--	--
			00521	00003	C.3.1.2	--	--	--
			00521	00004	C.2.3.1	--	--	--
	Hidden, William		00521	00007	C.2.8.2	--	--	--
			02456	00002	C.3.4.4	--	--	--
			02456	00003	C.2.1.1	--	--	--
	Hollis, Jack F.		00456	00001	C.2.1.2	--	--	--
			00456	00002	C.2.1.1	--	--	--
			00456	00003A	C.2.4.1	--	--	--
			00456	00003B	C.2.3.1	--	--	--
			00456	00004	C.3.4.4	--	--	--
	Holmes, Jenny		01289	00001	C.2.3.3	--	--	--
	Howell, Mary L.		01293	00001	C.2.4.1	--	--	--
			01293	00002	C.2.8.2	--	--	--
	Huette, Fred		02499	00001	C.3.1.2	--	--	--
			02499	00002	C.2.8.3	--	--	--
			02499	00003	C.2.4.1	--	--	--
			02499	00006	C.2.3.1	--	--	--
			02499	00007	C.3.4.4	--	--	--
			02499	00008	C.2.3.1	--	--	--
			02499	00009	C.2.1.3	--	--	--
			02499	00010	C.2.1.2	--	--	--
			02499	00011	C.2.3.1	--	--	--
	Hughes, Jim	WSSG	01364	00001	C.2.1.2	--	--	--
			01364	00002	C.2.1.2	--	--	--
			01364	00003	C.2.1.2	--	--	--
			01364	00004	C.2.1.2	--	--	--
			01364	00005	C.3.1.2	--	--	--
			01364	00006	C.2.1.2	--	--	--
	Jackson, Johnny		02460	00001	C.3.4.4	--	--	--
			02460	00003	C.3.1.2	--	--	--
	Jones, Rick & Kathy		01068	00001	C.3.4.4	--	--	--
	Juelfs, Caerl Payne & Larry		01550	00001	C.3.1.2	--	--	--
	Keller, Judith		01122	00001	C.3.4.4	--	--	--
			01122	00002	C.2.1.2	--	--	--
	Kirby, KW	Hood River County	01227	00001	C.3.1.2	--	--	--
	Kite, Sandra		00551	00003	C.2.1.2	--	--	--
			00551	00004	C.3.4.4	--	--	--

C.9-152

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Oregon (continued)								
	Kleiner, Mary E.		00669	00001	C.3.4.4	--	--	--
	Knuse, T. B.		01578	00002	C.3.2	--	--	--
	Korb, Nancy		02443	00001	C.2.3.3	--	--	--
			02443	00002	C.2.1.2	--	--	--
			02443	00003	C.3.1.2	--	--	--
			02443	00006	C.2.1.2	--	--	--
			02443	00007	C.2.3.1	--	--	--
			02443	00010	C.2.4.1	--	--	--
			02443	00011	C.3.4.4	--	--	--
	Lacourse, Victor		02449	00001	C.8.2	C.2.3.1	--	--
			02449	00002	C.2.4.1	--	--	--
			02449	00003	C.2.1.2	--	--	--
			02449	00005	C.2.1.2	--	--	--
			02449	00006	C.2.1.1	--	--	--
	Lasley, Mark		01157	00003	C.3.4.4	--	--	--
	LePage, Albert J.		00618	00001	C.3.1.1	--	--	--
			00618	00002	C.2.8	--	--	--
			00618	00003	C.2.8	--	--	--
			00618	00005	C.2.8.1	--	--	--
			00618	00008	C.2.8	--	--	--
			00618	00010	C.2.8	--	--	--
			00618	00011	C.2.8	--	--	--
			00618	00012	C.2.3.1	--	--	--
	Lieberman, Carol		02450	00001	C.2.1.2	--	--	--
			02450	00002	C.2.3.3	--	--	--
			02450	00003	C.3.1.2	--	--	--
			02450	00004	C.3.4.4	--	--	--
			02450	00005	C.3.1.2	--	--	--
			02450	00006	C.3.1.1	--	--	--
			02450	00007	C.2.1.1	--	--	--
			02450	00011	C.2.4.1	--	--	--
			02450	00012	C.2.4.1	--	--	--
			02450	00013	C.2.3.1	--	--	--
			02450	00014	C.3.1.2	--	--	--
	Lindberg, Mike		02455	00001	C.3.4.4	--	--	--
			02455	00002	C.2.1.2	--	--	--
			02455	00009	C.2.1.1	--	--	--
			02455	00010	C.2.1.2	--	--	--

C.9-153

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Oregon (continued)								
	Lindberg, Mike	Office of Public Affairs	02618	00001	C.3.4.4	--	--	--
			02618	00003	C.2.1.2	--	--	--
			02618	00004	C.2.2	--	--	--
			02618	00005	C.3.4.4	--	--	--
	Lindsay, John	WSSG	02618	00006	C.2.8.2	--	--	--
			01362	00002	C.2.1.2	--	--	--
			01362	00006	C.2.6.1	C.7.4	--	--
			01362	00007	C.2.1.1	--	--	--
	Lindstrom, Stephen R.	Port of Morrow	02079	00001	C.3.1.2	C.6.4	--	--
			02079	00002	C.2.4.1	--	--	--
			02079	00003	C.4.2.1	--	--	--
	Long, Jim		02461	00001	C.2.1.1	--	--	--
			02461	00002	C.2.1.1	--	--	--
			02461	00003	C.2.1.1	--	--	--
			02461	00004	C.3.1.2	--	--	--
			02461	00005	C.2.1	--	--	--
			02461	00006	C.2.4.1	--	--	--
			02461	00007	C.2.1.1	--	--	--
			02461	00010	C.2.4.1	--	--	--
			02461	00011	C.2.3.1	--	--	--
			02461	00012	C.2.3.2	--	--	--
			02461	00013	C.2.3.2	--	--	--
			02461	00014	C.2.2	--	--	--
	Luzier, James		02466	00003	C.3.4.4	--	--	--
	Maduro, Gina		02494	00001	C.2.3.1	--	--	--
			02494	00002	C.2.3.1	--	--	--
			02494	00003	C.2.3.1	--	--	--
			02494	00004	C.2.3.3	--	--	--
			02494	00005	C.3.1.2	--	--	--
			02494	00006	C.3.1.1	--	--	--
			02494	00007	C.3.1.2	--	--	--
			02494	00008	C.2.3.1	--	--	--
			02494	00009	C.2.3.1	--	--	--
			02494	00010	C.2.3.1	--	--	--
			02494	00011	C.2.1.2	--	--	--
			02494	00013	C.2.3.1	--	--	--
			02494	00014	C.2.3.1	--	--	--
			02494	00015	C.3.4.4	--	--	--

C.9-154

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Oregon (continued)								
	Marbet, Lloyd		02492	00002	C.2.1.1	--	--	--
			02492	00004	C.3.1.2	--	--	--
			02492	00005	C.2.3.1	--	--	--
			02492	00006	C.3.1.2	--	--	--
			02492	00007	C.2.5.1	--	--	--
	Margolis, William Marthaller, Karen & Don		00479	00001	C.2.1.1	--	--	--
			01167	00001	C.3.4.4	--	--	--
			01167	00003	C.3.4.4	--	--	--
	Mathis, Faith McLaughlin, Barbara		00299	00002	C.3.1.2	--	--	--
			02482	00001	C.3.4.4	--	--	--
			02482	00003	C.3.1.2	--	--	--
			02482	00004	C.2.4.1	--	--	--
			02482	00005	C.2.1.2	--	--	--
			02482	00008	C.2.3.3	--	--	--
			02476	00001	C.3.4.4	--	--	--
	McManus, Jorge		02476	00003	C.2.3.2	--	--	--
			02476	00007	C.2.4.1	--	--	--
			02476	00008B	C.2.2	--	--	--
			02487	00001	C.3.4.4	--	--	--
			02487	00002	C.2.8.1	--	--	--
	McManus, Mary		02487	00004	C.2.4.1	--	--	--
			02487	00005	C.2.4.1	--	--	--
			01107	00001	C.3.1.2	--	--	--
			02445	00001	C.3.4.4	--	--	--
	McVay, Merle Ann Mead, Bill		02445	00002	C.2.1.2	--	--	--
			01553	00004	C.2.4.1	--	--	--
	Miller, Mindy Miller, Caroline		02465	00001	C.3.4.4	--	--	--
			02465	00002	C.3.1.2	--	--	--
			02465	00003	C.2.1.2	--	--	--
			02465	00004	C.2.4.1	--	--	--
			02465	00005	C.2.1.1	--	--	--
			02465	00006	C.2.4.1	--	--	--
			02465	00007	C.2.1.1	--	--	--
			02479	00001	C.2.3.1	--	--	--
	Miller, Ron		02479	00002	C.3.1.1	--	--	--
			02479	00003	C.3.4.4	--	--	--
			02479	00004	C.3.1.2	--	--	--
			02479	00005	C.3.1.2	--	--	--
			02479	00005	C.3.1.2	--	--	--

C.9-155

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Oregon</u> (continued)								
			02479	00008	C.2.1.1	--	--	--
			02479	00009	C.2.7	--	--	--
			02479	00010	C.2.1.1	--	--	--
	Miller, Joseph		02479	00011	C.2.1.1	--	--	--
			02488	00001	C.3.4.4	--	--	--
			02488	00002	C.2.1.2	--	--	--
			02488	00003	C.3.1.2	--	--	--
			02488	00004	C.3.4.4	--	--	--
	Hilne, Thomas		02451	00001	C.3.1.2	--	--	--
			02451	00002	C.2.4.1	--	--	--
			02451	00004	C.3.3	--	--	--
			02451	00005	C.3.4.4	--	--	--
	Mix, Merryll		00611	00001	C.3.4.4	--	--	--
	Mix, Merryll		00677	00001	C.2.8.1	--	--	--
	Moore, Madeline		00234	00001	C.3.4.4	--	--	--
	Muller, Kris		00626	00001	C.2.4.1	--	--	--
			00626	00002	C.2.5.2	--	--	--
			00626	00003	C.2.3.1	--	--	--
			00626	00004	C.2.5.1	--	--	--
			00626	00005	C.2.1.1	--	--	--
	Muller, Chris		02283	00001	C.3.1.2	--	--	--
			02283	00003	C.2.4.1	--	--	--
			02283	00004	C.2.6.1	--	--	--
	Nicholas, Mrs. Edwin L.		02619	00002	C.2.4.1	--	--	--
			02619	00003	C.3.1.2	--	--	--
			02619	00004	C.2.3.1	--	--	--
			02619	00005	C.3.4.4	--	--	--
			02619	00007	C.2.4.1	--	--	--
			02619	00010	C.2.3.2	--	--	--
			02619	00011	C.3.4.4	--	--	--
	Nicholson, Jenny		00463	00001	C.2.1.1	--	--	--
			00463	00002	C.3.4.4	--	--	--
			00463	00005	C.3.4.4	--	--	--
	Nitsos, M.		01584	00001	C.3.4.4	--	--	--
	Pace, Evalyne		02464	00001	C.2.1.1	--	--	--
			02464	00002A	C.2.3	--	--	--
			02464	00004	C.3.4.2.1	--	--	--
			02464	00005	C.3.1.2	--	--	--

C.9-156

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION				
					FIRST	SECOND	THIRD	FOURTH	
Oregon (continued)									
	Palmer, Leonard		02464	00006	C.2.3.1	--	--	--	
			02468	00001	C.3.1.2	--	--	--	
			02468	00002	C.3.4.4	--	--	--	
			02468	00003	C.3.1.2	--	--	--	
			02468	00007	C.3.1.2	--	--	--	
	Patawa, Elwood	Umatilla Indian Reservation	02468	00008	C.2.1.2	--	--	--	
				01494	00001	C.2.1.2	--	--	--
				01494	00003	C.7.2	--	--	--
				01494	00007	C.2.6.1	--	--	--
				01494	00008	C.2.5.1	--	--	--
				01494	00009	C.3.1.2	--	--	--
				01494	00010	C.2.5.2	--	--	--
				01494	00011	C.2.7	--	--	--
				01494	00012	C.3.1.2	--	--	--
				01494	00013	C.2.7	--	--	--
				01494	00014	C.2.7	--	--	--
				01494	00015	C.2.4.1	--	--	--
				01494	00016	C.3.1.2	--	--	--
				01494	00017	C.3.4.3	--	--	--
				01494	00018	C.2.5.1	C.2.5.6	C.2.6.1	--
				01494	00019	C.2.1.2	--	--	--
				01494	00080	C.2.6.1	--	--	--
		01494	00106	C.3.4.4	--	--	--		
		01494	00107	C.3.4.1	--	--	--		
		01494	00108	C.3.4.1	--	--	--		
		01494	00109	C.3.4.1	--	--	--		
		01494	00110	C.3.4.1	--	--	--		
		01494	00111	C.3.4.1	--	--	--		
		01494	00112	C.7.3	--	--	--		
		01494	00113	C.2.4.1	--	--	--		
		01494	00114	C.2.4.1	--	--	--		
		01494	00115	C.7.3	--	--	--		
	Peck, John		01494	00116	C.3.4.3	--	--	--	
			00531	00001	C.3.1.2	--	--	--	
			00531	00002	C.3.1.1	--	--	--	
			00531	00003	C.3.1.2	--	--	--	
			00531	00004	C.2.3.1	--	--	--	
			00531	00007	C.2.4.1	--	--	--	

C.9-157

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Oregon</u> (continued)								
	Petersen, Gary & Family	House of Representatives	00531	00011	C.2.1.1	--	--	--
	Peterson, Nancy		00531	00012	C.2.1.2	--	--	--
			01302	00001	C.3.4.4	--	--	--
			01352	00001	C.3.4.4	--	--	--
			01352	00002	C.3.4.4	--	--	--
			01352	00006	C.2.1.2	--	--	--
	Phelps, Anne		02489	00003	C.2.1.1	--	--	--
	Powell, Laura		02472	00001	C.3.4.4	--	--	--
			02472	00002	C.3.1.2	--	--	--
			02472	00003	C.2.1.2	--	--	--
		02472	00004	C.3.1.2	--	--	--	
		02472	00005	C.2.5.1	--	--	--	
		02472	00006	C.3.4.4	--	--	--	
	Quinlan, Gordon	01291	00001	C.3.4.4	--	--	--	
	Rathbun, R. Keaney & Dr. Susan	01291	00002	C.3.1.2	--	--	--	
		00500	00003	C.2.1.2	--	--	--	
		00500	00004	C.2.8.1	--	--	--	
	Redfern, Roger	02453	00001	C.2.5.1	--	--	--	
		02453	00002	C.2.3.3	--	--	--	
		02453	00003	C.3.1.2	--	--	--	
		02453	00004	C.3.4.1	--	--	--	
		02453	00005	C.2.3.3	--	--	--	
		02453	00006	C.2.3.1	--	--	--	
		02453	00009	C.2.7	--	--	--	
	Rhoads, Laurel	00262	00002	C.3.1.2	--	--	--	
	Roy, Jeanne	02478	00001	C.2.2	--	--	--	
		02478	00002	C.3.1.2	--	--	--	
		02478	00003A	C.2.8.3	--	--	--	
	Ruben, Barbara	00449	00001	C.3.4.4	--	--	--	
	Saltzman, Dan	02484	00001	C.3.1.2	--	--	--	
		02484	00002	C.2.3.1	--	--	--	
		02484	00003	C.3.4.4	C.3.1.2	--	--	
		02484	00003A	C.3.4.4	--	--	--	
		02484	00003B	C.3.1.2	--	--	--	
		02484	00004	C.2.1.1	--	--	--	
	Schade, Dr. Charles P.	Multnomah County Oregon	00367	00002	C.7.3	--	--	
			00367	00004	C.7.3	--	--	
	Schectel, Tim		02481	00001	C.3.4.4	--	--	

G.9-158

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Oregon (continued)								
	Schietinger, Chuck		02500	00000	C.3.4.4	--	--	--
	Silver, Erika		02463	00001	C.2.4.1	--	--	--
			02463	00002	C.3.4.4	--	--	--
	Sleeman, Larry and Lori		00501	00002	C.2.4.1	--	--	--
	Smith, Julie		01219	00001	C.3.1.2	--	--	--
			01219	00002	C.2.4.1	--	--	--
			01219	00003	C.2.3	--	--	--
			01219	00004	C.2.3.3	--	--	--
			01219	00005	C.2.3	--	--	--
			01219	00006	C.3.1.2	--	--	--
			01219	00007	C.2.3	--	--	--
	Spillman, James		00671	00001	C.2.1.1	--	--	--
			00671	00008	C.2.3.1	--	--	--
	Stachon, Eric		02448	00001	C.2.1.2	--	--	--
			02448	00002	C.3.4.4	--	--	--
			02448	00003	C.2.3.1	--	--	--
	Stout, Myrna Duffy		01591	00001	C.3.4.4	--	--	--
			01591	00002	C.2.1.1	--	--	--
	Strong, Bruce		00218	00003	C.3.4.4	--	--	--
	Tucker, Tom		02458	00001	C.2.5.1	--	--	--
			02458	00002	C.2.5.2	--	--	--
			02458	00003	C.2.5.2	--	--	--
			02458	00004	C.2.6.1	--	--	--
			02458	00005	C.2.5.1	--	--	--
			02458	00006	C.2.4.1	--	--	--
			02458	00007	C.2.8.2	--	--	--
	Van Cise, Glen		01165	00001	C.3.4.4	--	--	--
			01165	00003	C.2.3	--	--	--
	VanCise, Debra J.		00436	00001	C.2.8	--	--	--
	Vivian, Pat		01593	00001	C.2.1.1	--	--	--
			01593	00002	C.3.1.2	--	--	--
			01593	00003	C.2.3.1	--	--	--
			01593	00004	C.3.4.4	--	--	--
	Vogt, Dr. Thomas M.		00484	00002	C.2.1.2	--	--	--
	Wallace, Jerry		02496	00002	C.5.3	C.3.4	--	--
			02496	00005	C.2.3.3	--	--	--
	Wapato, Tim		02447	00003	C.2.1.1	--	--	--
	Webster, T. R.	Dept. of Health & Human Services	01232	00001	C.3.1.2	--	--	--

C.9-159

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Oregon</u> (continued)								
	Weinmann, Sheila		01232	00002	C.2.4.1	C.7.3	--	--
			02454	00002	C.2.1.2	--	--	--
			02454	00003	C.2.1.2	--	--	--
			02454	00004	C.3.4.4	--	--	--
			02454	00006	C.2.4.1	--	--	--
			02454	00007	C.3.4.4	--	--	--
			02454	00008	C.3.4.4	--	--	--
			02454	00009	C.3.1.2	--	--	--
	Westervelt, Susan		01108	00001	C.3.4.4	--	--	--
			01108	00002	C.2.4.1	--	--	--
			01108	00006	C.3.4.4	--	--	--
			02471	00001	C.3.1.2	--	--	--
			02471	00002	C.2.8.1	--	--	--
			02471	00003	C.3.1.2	--	--	--
			02471	00004	C.3.1.2	--	--	--
	Williams, Hal and Cathy		00610	00001	C.3.1.2	--	--	--
			00610	00004	C.3.1.2	--	--	--
	Williams, Reece		02486	00002	C.2.8.3	--	--	--
			02486	00003	C.2.3.1	--	--	--
	Willits, Howard D.		02452	00001	C.3.4.4	--	--	--
	Wineland, Mrs. C.E.		00202	00001	C.3.1.2	--	--	--
			00202	00002	C.3.1.2	--	--	--
			00202	00003	C.3.4.4	--	--	--
	Wisecarver, Beth		01575	00001	C.3.1.2	--	--	--
	Yarbrough, Carol A.		01173	00001	C.3.4.4	--	--	--
<u>Pennsylvania</u>								
	Good, Milton	Z & G Rubber Horse Shoes	00001	00001	C.2.8.2	--	--	--
	Morgan, Robert E.		00401	00001	C.3.1.2	--	--	--
			00401	00007	C.3.4.4	--	--	--
	Ress, Regina		02711	00002	C.5.1	--	--	--
	Schmotzer, Michael & Constance		00653	00001	C.3.4.4	--	--	--
	Young, Alice C.		00203	00001	C.3.4.4	--	--	--
			00203	00003	C.3.1.2	--	--	--
	Young, Hugh		01072	00001	C.3.1.2	--	--	--

C.9-160

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
South Carolina								
	Taylor, Reid		00091	00001	C.3.4.4	--	--	--
Tennessee								
	Crass, Ted		00182	00001	C.3.1.2	--	--	--
	Hartman, Doris M.		00135	00002	C.3.1.2	--	--	--
	Honicker, Dolph		01869	00001	C.2.8.1	--	--	--
	White, Michael E.		00071	00001	C.3.4.4	--	--	--
Texas								
	Adibi, Alma		00378	00002	C.3.4.4	--	--	--
	Anderson, Gary		00699	00003	C.3.4.4	--	--	--
	Anonymous		00044	00001	C.2.8.1	--	--	--
	Anonymous		00206	00001	C.3.1.2	--	--	--
		City of Vega	00206	00004	C.3.1.2	--	--	--
			01271	00001	C.3.4.4	--	--	--
			01271	00002	C.2.1.5	--	--	--
			01271	00045	C.2.4.1	--	--	--
			01271	00051	C.2.1.1	--	--	--
		High Plains Underground Water	02139	00011	C.2.3.1	--	--	--
			02140	00001	C.3.1.2	--	--	--
			02140	00002	C.3.1.2	--	--	--
			02140	00003	C.2.3.2	--	--	--
			02140	00004	C.2.6	--	--	--
			02140	00023	C.2.7	--	--	--
			02140	00024	C.2.1.1	--	--	--
			02140	00025	C.2.4.3	--	--	--
			02140	00026	C.2.1.1	--	--	--
		Tulia Wheat Growers, Inc.	02135	00001	C.3.4.4	--	--	--
	Armitage, Mrs. R. A.		02164	00002	C.3.4.4	--	--	--
			02164	00009	C.2.5.2	--	--	--
	Auckerman, Georgia		00843	00001	C.2.7	--	--	--
			00843	00003	C.3.1.1	--	--	--
			00843	00004	C.3.1.2	--	--	--
			00843	00005	C.3.1.2	--	--	--
			00843	00006	C.3.1.2	--	--	--
			00843	00007	C.3.1.2	--	--	--

C.9-161

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Texas (continued)</u>								
			00843	00008	C.3.1.2	--	--	--
			00843	00009	C.2.1.1	--	--	--
	Bair, Nova		00865	00002	C.3.1.2	--	--	--
	Bair, Mrs. Nova S.		02159	00001	C.3.1.2	--	--	--
	Barber, P.E., Gene R.	Herriman & Barber	02086	00004	C.7.3	--	--	--
			02086	00005	C.7.4.3	C.7.1.2	--	--
	Barnard, Charlene		00875	00002	C.2.8.2	--	--	--
			00875	00003	C.2.1.2	--	--	--
	Barnes, Debbie		00715	00004	C.2.7	--	--	--
			00715	00005	C.3.4.4	--	--	--
	Beck, Malcolm	Garden-Ville Fertilizer Co.	02708	00001	C.3.4.4	--	--	--
			02708	00002	C.2.5.2	--	--	--
	Blakely, Lisa		00848	00001	C.2.1.1	--	--	--
			00848	00002	C.2.7	--	--	--
			00848	00003	C.2.7	--	--	--
			00848	00004	C.3.4.4	--	--	--
			00848	00008	C.2.1.5	--	--	--
			00848	00011	C.2.1.2	--	--	--
	Bledsoe, Jolene		00177	00003	C.3.4.4	--	--	--
			00177	00004	C.2.4.1	--	--	--
	Bledsoe, Jolene		02165	00001	C.3.1.2	--	--	--
			02165	00002	C.2.8.3	--	--	--
			02165	00003	C.2.4.1	--	--	--
	Boatwright, Kenneth	TX Dept. of Agriculture	01383	00026	C.7.4.2	C.2.1.5	--	--
			01383	00028	C.2.7	--	--	--
	Borchardt, Mona		00705	00001	C.3.4.4	--	--	--
			00705	00008	C.3.4.4	--	--	--
	Borchardt, Mona		02131	00001	C.3.4.4	--	--	--
			02131	00007	C.3.4.4	--	--	--
	Boulter, Beau		00689	00001	C.3.4.4	--	--	--
			00689	00002	C.3.4.4	--	--	--
			00689	00003	C.2.1.1	--	--	--
			00689	00004	C.3.1.2	--	--	--
			00689	00005	C.2.8.2	--	--	--
			00689	00006	C.2.8.2	--	--	--
			00689	00007	C.3.4.4	--	--	--
			00689	00008	C.2.1.2	--	--	--
	Boulter, Beau	Texas Representative	02124	00001	C.2.1.2	--	--	--

C.9-162

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Texas (continued)</u>								
			02124	00002	C.3.4	--	--	--
			02124	00003	C.2.8.2	--	--	--
			02124	00004	C.2.8.2	--	--	--
			02124	00005	C.2.8.2	--	--	--
			02124	00006	C.2.1.2	--	--	--
	Bright, Eunice		00708	00001	C.3.1.2	--	--	--
			00708	00002	C.3.1.1	--	--	--
			00708	00003	C.3.3.2	--	--	--
			00708	00005	C.7.3	--	--	--
	Bright, Lulu Marjorie		00710	00003	C.2.7	--	--	--
	Briscoe, Greg		00895	00001	C.2.7	--	--	--
			00895	00005	C.2.8.2	--	--	--
			00895	00006	C.2.3.2	--	--	--
			00895	00007	C.2.8.1	--	--	--
			00895	00009	C.3.2	--	--	--
	Brody, Julie		00836	00007	C.2.3.1	--	--	--
	Brody, Julia	TX Dept. of Agriculture	01384	00003	C.3.4.4	--	--	--
			01384	00007	C.2.1.1	--	--	--
			01384	00008	C.2.7	--	--	--
	Brody, Julie	Texas Department of Agriculture	02138	00007	C.2.8.2	--	--	--
	Byrd, Wylie		00706	00001	C.3.4.4	--	--	--
	Chedester, Barbara		00029	00001	C.3.4.4	--	--	--
	Claire, Clendon B.		00376	00002	C.3.4.4	--	--	--
	Coleman, Jean		00375	00002	C.3.4.4	--	--	--
	Combest, Larry		00835	00002	C.3.1.2	--	--	--
			00835	00006	C.3.1.2	--	--	--
			02137	00002	C.3.1.2	--	--	--
	Cominos, Nicholas		00892	00001	C.2.1.1	--	--	--
			00892	00002	C.2.8.1	--	--	--
			00892	00003	C.2.8.1	--	--	--
	Cook, Joanne		00847	00001	C.3.1.2	--	--	--
	Cook, Joanne		02144	00001	C.3.1.2	--	--	--
	Cooper, Margaret		00857	00003	C.3.4.4	--	--	--
	Cooper, Margaret Owen		02152	00003	C.3.4.4	--	--	--
	Dawson, Marjorie		00695	00001	C.3.1.2	--	--	--
			00695	00003	C.2.4.1	--	--	--
	Dawson, Marjorie Musick		02127	00001	C.3.4.4	--	--	--
			02127	00003	C.7.3	--	--	--

C.9-163

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Texas (continued)								
	Denko, Dr. John V.	Northwest Texas Hospital	01266	00003	C.3.4.4	--	--	--
			01266	00004	C.2.4.1	--	--	--
	Devin, Delbert		00691	00001	C.2.7	--	--	--
	Devin, Albert		00716	00001	C.3.4.4	C.7.4.2	--	--
			00716	00003	C.3.4.4	--	--	--
			00716	00004	C.3.1.2	--	--	--
			00716	00005	C.2.3.3	--	--	--
			00716	00006	C.2.3.3	--	--	--
	Devin, Delbert		00885	00001	C.2.7	--	--	--
			00885	00009	C.3.4.2.1	--	--	--
	Ford, Melva		00010	00001	C.3.4.4	--	--	--
	Ford, Melva		00017	00001	C.3.4.4	--	--	--
			00017	00002	C.3.4.4	--	--	--
			00017	00003	C.3.1.2	--	--	--
	Ford, Melva		00022	00001	C.3.4.4	--	--	--
	Ford, Mrs. Melva R.		00028	00001	C.3.4.4	--	--	--
	Ford, Frank		00876	00001	C.3.1.2	--	--	--
			00876	00003	C.2.1.1	--	--	--
	Ford, Melva R.		01338	00001	C.2.1.1	--	--	--
	Forrest, Richard		00851	00002	C.7.4	--	--	--
	Forrest, Richard	Witherspoon, Aikin & Langley	01270	00018	C.2.8.2	--	--	--
	Frishman, Steve	Nuclear Waste Prgrms. Office	02686	00001	C.2.5.1	--	--	--
			02686	00002	C.2.8.2	--	--	--
			02686	00003	C.3.1.1	--	--	--
			02686	00004	C.2.6.1	--	--	--
			02686	00005	C.2.4.1	--	--	--
			02686	00012	C.3.1.2	--	--	--
			02686	00013	C.3.1.2	--	--	--
			02686	00016	C.3.4.3	--	--	--
			02686	00017	C.2.3.1	--	--	--
			02686	00018	C.2.7	--	--	--
	Frishman, Steve	Nuclear Waste Prgrms. Office	02687	00001	C.2.7	--	--	--
			02687	00003	C.2.7	--	--	--
			02687	00005	C.4.1.1.3	--	--	--
			02687	00011	C.4.1.1	--	--	--
			02687	00012	C.2.8	--	--	--
			02687	00017	C.2.7	--	--	--
			02687	00022A	C.3.4.1	--	--	--

C.9-164

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Texas (continued)								
			02687	00022B	C.3.4.2	--	--	--
			02687	00022C	C.3.4.1	--	--	--
			02687	00097	C.2.3.1	--	--	--
			02687	00100	C.2.3.1	--	--	--
			02687	00105	C.2.2	--	--	--
			02687	00155	C.2.1.2	--	--	--
			02687	00156	C.2.1.2	--	--	--
	Frishman, Steve	Nuclear Waste Prgms. Office	02688	000101	C.2.7	--	--	--
			02688	00016	C.2.4.1	--	--	--
			02688	00017	C.2.4.1	--	--	--
			02688	00018	C.2.4.1	--	--	--
			02688	00019	C.2.4.1	--	--	--
			02688	00020	C.7.3	C.2.8.2	--	--
			02688	00021	C.2.4.1	--	--	--
			02688	00022	C.2.4.1	--	--	--
			02688	00023	C.2.4.1	--	--	--
			02688	00024	C.2.4.1	--	--	--
			02688	00025	C.2.4.1	--	--	--
			02688	00026	C.2.4.1	--	--	--
			02688	00027	C.2.4.1	--	--	--
			02688	00028	C.2.4.1	--	--	--
			02688	00029	C.2.4.1	--	--	--
			02688	00030	C.2.4.1	--	--	--
			02688	00031	C.2.4.1	--	--	--
			02688	00032	C.2.4.1	--	--	--
			02688	00033	C.2.4.1	--	--	--
			02688	00034	C.2.4.1	--	--	--
			02688	00035	C.2.4.1	--	--	--
			02688	00036	C.2.4.1	--	--	--
			02688	00037	C.2.4.1	--	--	--
			02688	00038	C.2.4.1	--	--	--
			02688	00040	C.2.4.1	--	--	--
			02688	00041	C.2.4.1	--	--	--
			02688	00057	C.2.7	--	--	--
			02688	00061	C.3.4.3	--	--	--
			02688	00062	C.3.4.3	--	--	--
			02688	00063	C.3.4.3	--	--	--

G.9-165

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Texas</u> (continued)								
			02688	00064	C.3.1.1	--	--	--
			02688	00070	C.2.6.1	--	--	--
			02688	00077	C.3.1.2	--	--	--
			02688	00078	C.3.1.2	--	--	--
			02688	00079	C.3.1.2	--	--	--
			02688	00082	C.2.4.1	--	--	--
			02688	00083	C.2.4.1	--	--	--
			02688	00094	C.3.4.1	--	--	--
			02688	00097	C.2.1.3	--	--	--
			02688	00128	C.2.1.1	--	--	--
	Frishman, Steve	Nuclear Waste Prgrms. Office	02689	00006	C.2.7	--	--	--
	Frishman, Steve	State of Texas	01381	00001	C.2.7	--	--	--
			01381	00002	C.2.7	--	--	--
			01381	00015	C.2.7	--	--	--
			01381	00207	C.3.4.1	--	--	--
			01381	00208	C.3.4.1	--	--	--
			01381	00209	C.3.4.1	--	--	--
			01381	00210	C.3.4.1	--	--	--
			01381	00211	C.3.4.1	--	--	--
			01381	00212	C.3.4.1	--	--	--
			01381	00213	C.3.4.1	--	--	--
			01381	00214	C.3.4.1	--	--	--
			01381	00215	C.3.4.1	--	--	--
			01381	00216	C.3.4.1	--	--	--
			01381	00217	C.3.4.1	--	--	--
			01381	00218	C.3.4.1	--	--	--
			01381	00219	C.3.4.1	--	--	--
			01381	00220	C.3.4.1	--	--	--
			01381	00221	C.3.4.1	--	--	--
			01381	00222	C.3.4.1	--	--	--
			01381	00223	C.3.4.1	--	--	--
			01381	00224	C.3.4.2.2	--	--	--
			01381	00225	C.3.4.2	--	--	--
			01381	00226	C.7.3	--	--	--
			01381	00227	C.3.4.2	--	--	--
			01381	00228	C.3.4.2.3	--	--	--
	Frishman, Steve	TX Dept. of Agriculture	01382	00009	C.2.7	--	--	--
			01382	00038	C.3.4.2.2	--	--	--

C.9-166

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Texas (continued)								
	Frishman, Steve	Nuclear Waste Prgms. Office	01382	00039	C.3.4.2.2	--	--	--
			01380	00001	C.2.7	--	--	--
	Galbraith, Shirley		01380	00001A	C.2.1.1	--	--	--
			00852	00001B	C.3.1.1	--	--	--
			00852	00002B	C.3.1	--	--	--
	Galbraith, Shirley		02148	00001B	C.3.1.1	--	--	--
	Gibbons, Lucille		00873	00002	C.3.4.4	--	--	--
			00873	00009	C.2.7	--	--	--
	Gierisch, Bobby		00877	00002	C.3.4.4	C.2.1.1	--	--
	Givans, Cam		00702	00002	C.3.4.4	--	--	--
			00702	00003	C.2.1.1	--	--	--
	Hamilton, Jo		00007	00001	C.3.1.2	--	--	--
			00007	00002	C.2.1.1	--	--	--
	Hancock, Don		00717	00008	C.2.1.1	--	--	--
			00717	00009	C.3.1.1	--	--	--
	Hancock, Don		00717	00011	C.3.1.1	--	--	--
			00869	00001	C.3.4.1	--	--	--
			00869	00002	C.3.4.3	--	--	--
			00869	00003	C.6.3	C.3.4.2.2	--	--
			00869	00004	C.3.4.2.1	--	--	--
			00869	00005	C.3.4.2.2	--	--	--
			00869	00006	C.3.4.3	--	--	--
	Hancock, Don		00884	00001	C.2.7	--	--	--
			00884	00008	C.2.3.1	--	--	--
	Hancock, Don	Landowners in Deaf Smith, Swisher	01260	00003	C.3.1.2	--	--	--
			01260	00004	C.3.1.2	--	--	--
			01260	00005	C.2.8	--	--	--
			01260	00007	C.2.7	--	--	--
			01260	00008	C.2.8.3	--	--	--
			01260	00009	C.2.8	--	--	--
			01260	00010	C.2.7	--	--	--
			01260	00011	C.3.1.2	--	--	--
			01260	00012	C.2.7	--	--	--
			01260	00013	C.2.7	--	--	--
			01260	00014	C.2.7	--	--	--
			01260	00015	C.2.7	--	--	--
			01260	00020	C.2.8.3	--	--	--
			01260	00021	C.3.1.2	--	--	--

C.9-167

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Texas (continued)</u>								
			01260	00022	C.2.7	--	--	--
			01260	00023	C.3.1.2	--	--	--
			01260	00024	C.3.1.2	--	--	--
			01260	00025	C.3.1.2	--	--	--
			01260	00026	C.2.1.1	--	--	--
			01260	00027	C.3.1.2	--	--	--
			01260	00032	C.3.1.2	--	--	--
			01260	00033	C.3.4.2.2	--	--	--
			01260	00088	C.2.2	--	--	--
			01260	00089	C.2.2	--	--	--
			01260	00092	C.3.4.4	--	--	--
			01260	00093A	C.3.4.4	--	--	--
			01260	00093B	C.3.4.1	--	--	--
			01260	00094	C.3.4.4	--	--	--
			01260	00095	C.3.4.2.1	--	--	--
			01260	00096	C.3.4.2.1	--	--	--
			01260	00097	C.3.4.2.1	--	--	--
			01260	00098	C.3.4.2.1	--	--	--
			01260	00099	C.4.2.2	--	--	--
			01260	00100	C.4.2.2	--	--	--
			01260	00101	C.3.4.2.2	--	--	--
			01260	00102	C.3.4.2.2	--	--	--
			01260	00103	C.3.4.4	--	--	--
			01260	00118	C.3.1.2	--	--	--
			01260	00119	C.2.7	--	--	--
			01260	00120	C.2.7	--	--	--
			01260	00121	C.3.1.2	--	--	--
			01260	00142	C.2.2.1	--	--	--
			01260	00146	C.2.4.1	--	--	--
			01260	00156	C.3.1.2	--	--	--
			01260	00158	C.2.2	--	--	--
			01260	00170	C.2.2.1	--	--	--
			01260	00171	C.2.4.3	--	--	--
			01260	00172	C.2.1.1	--	--	--
Hancock, Don		Stand and Power	02692	00002	C.4.1.1	--	--	--
			02692	00003	C.2.5.1	C.2.6.1	--	--
			02692	00004	C.2.2	--	--	--
			02692	00006	C.7.4.2	C.3.2	C.7.1.2	--

C.9-168

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Texas (continued)</u>								
			02692	00007	C.7.4.2	C.7.1.2	--	--
			02692	00008	C.7.4.2	C.7.1.2	--	--
			02692	00009	C.7.4.2	C.7.1.2	--	--
			02692	00010	C.7.2.1	--	--	--
			02692	00011	C.7.4.2	C.7.1.2	--	--
			02692	00012	C.7.4.2	C.3.2	C.7.1.2	--
			02692	00013	C.5.1	C.7.1.1.8	C.7.2.8	--
			02692	00014	C.7.2	--	--	--
			02692	00016	C.3.4.3	--	--	--
			02692	00017	C.2.6.1	--	--	--
			02692	00019	C.3.4.2.2	C.2.4.1	--	--
			02692	00020	C.2.5.1	--	--	--
			02692	00021	C.2.6.1	--	--	--
			00700	00001	C.3.4.4	--	--	--
		Texas Wheat Producers Assn.	02130	00001	C.3.4.4	--	--	--
			00897	00001	C.3.4.4	--	--	--
			00850	00001	C.3.4.4	--	--	--
			00850	00002	C.2.1.2	--	--	--
			00703	00002	C.2.3.3	--	--	--
			00703	00003	C.2.1.2	--	--	--
			00703	00004	C.2.1.2	--	--	--
			00703	00005	C.2.3.3	--	--	--
			00703	00006	C.2.1.2	--	--	--
			00870	00002	C.2.7	--	--	--
			00870	00003	C.3.1.1	--	--	--
			00870	00004	C.3.1.2	--	--	--
			00870	00006	C.2.7	--	--	--
			00889	00002	C.2.1.1	--	--	--
			00889	00004	C.3.1.3	C.3.1.2	--	--
			00704	00001	C.2.1.1	--	--	--
			00704	00002	C.2.1.1	--	--	--
		Texas Historical Commission	01747	00001	C.2.8.2	--	--	--
			00849	00004	C.4.1	C.2.1.1	--	--
			00880	00001	C.3.4.4	--	--	--
			00880	00002A	C.2.2.1	--	--	--
			00880	00002B	C.3.1.2	--	--	--
			00880	00002C	C.3.4.4	--	--	--
			02146	00001	C.4.1	C.3.4.4	--	--

C.9-169

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Texas (continued)								
	Hightower, Commissioner Jim	Commissioner of Agriculture	00878	00007	C.3.1.2	--	--	--
	Hightower, Jim		02128	00001	C.2.7	--	--	--
	Hogue, Sanny Sue		00874	00004	C.2.8.1	--	--	--
	House, Gary		00694	00001	C.3.4.4	--	--	--
	Irlbeck, Albert		00718	00001	C.3.1.1	--	--	--
			00718	00009	C.7.3	--	--	--
			00718	00010	C.3.1.2	--	--	--
	Keith, Ronnie W.		00066	00001A	C.3.4.4	--	--	--
			00066	00001B	C.3.4.4	--	--	--
	Kirkpatrick, Ann		02136	00001	C.3.1.2	--	--	--
	Kleinkauf, Kathleen	00506	00001	C.3.4.4	--	--	--	
	Kleuskens, Tonya	00846	00001	C.2.1.1	--	--	--	
		00846	00005	C.2.1.1	--	--	--	
		00846	00006	C.2.1.1	--	--	--	
		00846	00015	C.2.2	--	--	--	
	La Fever, Lou Ann	00011	00004	C.3.1.2	--	--	--	
	Lamb, Angela	00690	00005	C.2.1.1	--	--	--	
	Lamb, Angela K.	02125	00005	C.2.1.5	--	--	--	
	Lloyd, Browning	00709	00001	C.2.1.1	--	--	--	
		00709	00002	C.3.4.4	--	--	--	
		00709	00003	C.3.4.4	--	--	--	
		00709	00004	C.3.4.4	--	--	--	
		00709	00005	C.3.1.2	--	--	--	
		00709	00006	C.3.1.2	--	--	--	
		00709	00007	C.2.3.3	--	--	--	
		00709	00008	C.3.1.1	--	--	--	
		00709	00009	C.3.1.2	--	--	--	
	McClurg, Mary M.	J. N. Montgomery Farms	00536	00005	C.2.1.1	--	--	--
			00536	00006	C.2.8.2	--	--	--
			00536	00007	C.3.2	--	--	--
	McClurg, Mrs. Mary Montgomery		02134	00001	C.3.4.4	--	--	--
			02134	00002	C.2.3.2	--	--	--
			02134	00005	C.2.3.3	--	--	--
			02134	00006	C.2.1.5	--	--	--
	McKeever, Terry		00692	00001	C.3.4.4	--	--	--
	McNeil, Marianne		02158	00004	C.3.1.2	--	--	--
	McReynolds, Don	High Plains Underground Water	01243	00009	C.2.7	--	--	--
			01243	00010	C.3.1.2	--	--	--

C.9-170

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Texas (continued)								
			01243	00011	C.2.3.2	--	--	--
			01243	00012	C.2.4.1	--	--	--
			01243	00021	C.2.7	--	--	--
			01243	00024	C.2.1.1	--	--	--
			01243	00064	C.2.4.1	--	--	--
			01341	00002	C.2.1.1	--	--	--
	Meiwe, Patricia		00055	00001	C.3.4.4	--	--	--
	Moore, Jr., George		00056	00001	C.3.4.4	--	--	--
	Moore, Murphy, Ivey J.		00180	00001	C.3.4.4	--	--	--
	Moore/Stafford, Raymond/Faye		00894	00003	C.2.8.1	--	--	--
	Oliver, Bill		00698	00001	C.2.8.2	--	--	--
	Ontiveras, Manuel		00698	00002	C.2.3.1	--	--	--
			00698	00003	C.3.4.4	--	--	--
			00698	00004	C.3.1.2	--	--	--
			00698	00007	C.3.4.4	--	--	--
	Paganini, Otto		00893	00001	C.2.7	--	--	--
			00893	00006	C.2.8.2	--	--	--
	Parker, Walker & Nancy		01268	00001	C.3.4.4	--	--	--
	Paschel, Louis		00867	00001	C.2.4.1	--	--	--
	Paschel, Anthony & Katherine		01161	00001	C.3.4.4	--	--	--
			01161	00003	C.2.1.1	--	--	--
	Petition		01265	00004	C.2.4.1	--	--	--
	Petition		01269	00001	C.3.4.4	--	--	--
			01269	00006	C.2.4.1	--	--	--
	Petition	Lamb County	02163	00001	C.3.1.2	--	--	--
	Pickering, George	University of Texas at Austin	01076	00001	C.3.1.2	C.7.4.5	--	--
	Pickering, George W.		01360	00001	C.2.1.1	--	--	--
			01360	00002	C.2.1.2	--	--	--
			01360	00004	C.2.1.1	--	--	--
	Revell, Tim		00853	00004	C.2.1.2	--	--	--
			00853	00006	C.2.4.1	--	--	--
			00853	00010	C.3.1.1	--	--	--
	Richardson, Donald		00860	00014	C.2.1.1	--	--	--
	Richardson, Wayne		00887	00010	C.3.1.2	--	--	--
	Richardson, Donald		02154	00014	C.2.1.1	--	--	--
	Rike, John		00713	00005	C.3.1.2	--	--	--
	Rike, III, John S.	First State Bank, Tullia, TX	02119	00003	C.3.1.2	--	--	--
	Riley, Barbara L.		00008	00003	C.3.4.4	--	--	--

C:9-171

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Texas (continued)								
	Schermebeck, Jim		00883	00001	C.3.4.4	--	--	--
			00883	00002	C.2.8.1	--	--	--
	Schoenenberger, Margaret		00278	00001	C.3.4.4	--	--	--
			00278	00004	C.2.8.2	--	--	--
	Shults, Regina		00896	00001	C.2.8.1	--	--	--
	Southard, E.		01267	00001	C.3.1.2	--	--	--
	Stanford, Geoffrey		00881	00002	C.2.8.1	--	--	--
			00881	00003	C.2.5.2	--	--	--
	Staniswalis, Chip		02133	00001	C.2.1.1	--	--	--
			02133	00002	C.3.4.4	--	--	--
			02133	00003	C.3.4.4	--	--	--
			02133	00004	C.3.4.4	--	--	--
			02133	00005	C.2.1.1	--	--	--
			02133	00006	C.3.4.3	--	--	--
			02133	00007	C.2.3.3	--	--	--
			02133	00008	C.3.1.1	--	--	--
			02133	00009	C.2.4.3	--	--	--
	Taylor, Nancy		00374	00002	C.3.4.4	--	--	--
	Taylor, Roy and Evelyn		00493	00007	C.2.3.3	--	--	--
			00493	00011	C.2.1.1	--	--	--
			00493	00013	C.3.1.1	--	--	--
			00493	00014	C.3.1.2	--	--	--
	Thomas-Williams, Colonel Robert		00858	00001	C.2.3.1	--	--	--
			00858	00002	C.3.1.2	--	--	--
			00858	00015	C.2.4.1	--	--	--
	Thomas-Williams, Colonel Robert		01367	00001	C.2.8.2	--	--	--
			01367	00002	C.2.4.1	--	--	--
			01367	00004	C.3.1.2	--	--	--
			01367	00005	C.3.2	--	--	--
			01367	00009	C.2.8.3	--	--	--
			01367	00010	C.2.8.3	--	--	--
			01367	00011	C.2.8	--	--	--
			01367	00012	C.2.4.1	--	--	--
			01367	00013	C.2.4.1	--	--	--
			01367	00014	C.2.4.1	--	--	--
			01367	00015	C.2.8.2	--	--	--
			01367	00016	C.2.8.2	--	--	--
			01367	00017	C.2.8.2	--	--	--

C.9-172

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Texas (continued)</u>								
	Tooley, Wendell		00707	00001	C.3.4.4	--	--	--
			00707	00003	C.3.1.2	--	--	--
	Tooley, Wendell	The Tulia Herald	02132	00001	C.3.4.4	--	--	--
			02132	00003	C.3.4.4	--	--	--
			02132	00005	C.3.1.2	--	--	--
	Vines, Theresa		00377	00002	C.3.4.4	--	--	--
	Wallace, Dr. Wes		00891	00001	C.2.8.1	--	--	--
			00891	00004	C.2.1.1	--	--	--
	Wenzler, Michael		00719	00003A	C.7.3	--	--	--
			00719	00003B	C.7.3	--	--	--
			00719	00008	C.2.5.2	--	--	--
	Wenzler, Michael		02167	00005	C.2.5.2	--	--	--
			02167	00006	C.2.8.2	--	--	--
	White, Governor Mark		00879	00001	C.2.1.1	C.3.1.1	--	--
			00879	00003	C.2.1.1	--	--	--
			00879	00010	C.3.4.3	--	--	--
			00879	00011	C.2.3.2	--	--	--
			00879	00012	C.3.1.2	--	--	--
	Whitson, Hollis		00711	00003	C.3.4.4	--	--	--
			00711	00007	C.3.4.4	--	--	--
	Whitson, Hollis		00886	00002	C.2.3.2	--	--	--
			00886	00003	C.3.1.2	--	--	--
			00886	00004	C.3.1.2	--	--	--
	Witkowski, Leo		02151	00004	C.3.1.2	--	--	--
	Womack, Tommy		00714	00002	C.2.8.1	C.7.4.2	--	--
	Woods, Becky		00712	00001	C.2.1.1	--	--	--
			00712	00003	C.3.4.4	--	--	--
	Wyatt, Wayne		00693	00001	C.2.1.1	--	--	--
			00693	00002	C.2.7	--	--	--
<u>Utah</u>								
	Adams, Lisle		00921	00001	C.3.4.4	--	--	--
			00921	00002	C.3.4.4	--	--	--
	Adams, Bruce B.	Petition	00015	00001	C.3.4.4	--	--	--
	Adams, Lisle	Gibson Dome Oversight Committee	02179	00001	C.3.4.4	--	--	--
			02179	00002	C.3.4.4	--	--	--
	Aide, Mitch		00815	00001	C.3.1.2	--	--	--

C.9-173

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Utah (continued)								
	Anderson, Lyle		00927	00001	C.3.4.3	--	--	--
	Anderson, Lyle R.		02184	00001	C.3.1.2	--	--	--
			02184	00002	C.2.1.1	--	--	--
			02184	00004	C.3.4.3	--	--	--
			02184	00005	C.3.1.1	--	--	--
	Anonymous		02221	00001	C.4.1.1.3	--	--	--
			02221	00002	C.3.4.4	--	--	--
	Anonymous		02222	00006	C.2.8.1	--	--	--
			02222	00009	C.2.2	--	--	--
	Anonymous		02223	00001	C.3.1.2	--	--	--
			02223	00002	C.3.1.2	--	--	--
		City of Monticello	02187	00001	C.3.4.3	--	--	--
			02187	00002	C.6.3	C.4.1.3.3	--	--
			02187	00003	C.3.4.2.2	--	--	--
			02187	00004	C.3.4.2.2	--	--	--
			02187	00006	C.3.4.2	--	--	--
		Robert Frost School	02213	00001	C.3.1.2	--	--	--
			02213	00002	C.2.8.2	--	--	--
			02213	00003	C.2.8.2	--	--	--
	Archuleta, Letitia		02216	00001	C.7.2	--	--	--
			02216	00002	C.7.2	--	--	--
	Archuleta, Letitia		00798	00001	C.3.1.2	--	--	--
			00798	00002	C.3.1.2	C.3.1.3	--	--
	Arnold, Thomas		00749	00001	C.2.1.1	--	--	--
	Baer, T. John		00735	00004	C.2.4.1	--	--	--
	Balcom, Julia		00833	00011	C.2.1.1	--	--	--
	Balling, Kurt		00737	00001	C.3.4.4	--	--	--
			00737	00003	C.2.4.1	--	--	--
	Bangerter, Governor Norman H.		00750	00001	C.2.1.1	--	--	--
			00750	00002	C.2.1.1	--	--	--
			00750	00003	C.2.5.1	--	--	--
			00750	00004	C.2.3.3	--	--	--
			00750	00005	C.3.1.2	--	--	--
			00750	00013	C.3.4.3	--	--	--
	Bangerter, Governor Norman H.		02188	00001	C.2.1.2	--	--	--
			02188	00002	C.2.1.1	--	--	--
			02188	00003	C.2.5.1	--	--	--
			02188	00004	C.2.3.3	--	--	--

C.9-174

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah (continued)</u>								
			02188	00005	C.3.1.2	--	--	--
			02188	00013	C.3.4.3	--	--	--
			01392	00003	C.2.7	--	--	--
			01392	00032	C.3.1.2	--	--	--
			01392	00033	C.3.1.2	--	--	--
			01392	00034	C.3.1.2	--	--	--
			01392	00443	C.4.2.4	--	--	--
			01392	00444	C.4.2.4	--	--	--
			01392	00460	C.2.8.2	--	--	--
			01392	00668	C.2.4.1	--	--	--
			01392	00671	C.2.4.1	--	--	--
			01392	00672	C.2.4.1	--	--	--
			01392	00674	C.2.4.1	--	--	--
			01392	00675	C.2.4.1	--	--	--
			01392	00683	C.2.4.1	--	--	--
			01392	00801	C.2.7	--	--	--
			01392	00802	C.3.1.1	--	--	--
			01392	00942	C.2.4.1	--	--	--
			01392	00943	C.2.4.1	--	--	--
			01392	00962	C.2.4.1	--	--	--
			01392	00974	C.3.4.3	--	--	--
			01392	00975	C.3.4.3	--	--	--
			01392	01026	C.2.7	--	--	--
			01392	01117	C.3.4.3	--	--	--
			01392	01118	C.3.4.3	--	--	--
			01392	01119	C.3.4.3	--	--	--
			01392	01125	C.7.2	C.2.7	--	--
			01392	01133	C.3.4.2.2	--	--	--
			01392	01135	C.3.4.2.2	--	--	--
			01392	01138	C.3.4.2.2	--	--	--
			01392	01139	C.3.4.2.2	--	--	--
			01392	01140	C.3.4.2.2	--	--	--
			01392	01141	C.3.4.2.2	--	--	--
			01392	01142	C.3.4.2.3	--	--	--
			01392	01144	C.7.3	--	--	--

G.9-175

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Utah (continued)								
			01392	01145	C.7.3	--	--	--
			01392	01146	C.7.3	--	--	--
			01392	01147	C.7.3	--	--	--
			01392	01148	C.7.3	--	--	--
			01392	01149	C.7.3	--	--	--
			01392	01150	C.7.3	--	--	--
			01392	01151	C.7.3	--	--	--
			01392	01152	C.7.3	--	--	--
			01392	01153	C.7.3	--	--	--
			01392	01154	C.7.3	--	--	--
			01392	01155	C.7.3	--	--	--
			01392	01156	C.7.3	--	--	--
			01392	01157	C.7.3	--	--	--
			01392	01158	C.2.1.1	--	--	--
			01392	01159	C.2.1.2	--	--	--
			01392	01160	C.2.3.1	--	--	--
			01392	01161	C.2.8.3	--	--	--
			01392	01162	C.3.1.1	--	--	--
			01392	01163	C.3.1.1	--	--	--
			01392	01164	C.2.8.3	--	--	--
			01392	01165	C.2.8.3	--	--	--
			01392	01166	C.2.8.3	--	--	--
			01392	01167	C.2.8.3	--	--	--
			01392	01168	C.2.8.3	--	--	--
			01392	01172	C.3.1.2	--	--	--
			01392	01173	C.3.1.3	--	--	--
			01392	01182	C.4.3	--	--	--
			01392	01184	C.4.2	--	--	--
			01392	01191	C.2.7	--	--	--
			01392	01195	C.3.4.4	--	--	--
			01392	01196	C.3.4.4	--	--	--
			01392	01198	C.2.8.3	--	--	--
			01392	01199	C.2.7	--	--	--
			01392	01200	C.2.8.2	--	--	--
			01392	01201	C.2.7	--	--	--
			01392	01204	C.2.7	--	--	--
			01392	01205	C.2.7	--	--	--
			01392	01216	C.2.1.1	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Utah (continued)								
	Barnes, Richard D.	CO Riv Basin/Salinity Control	01392	01276	C.2.4	--	--	--
	Barnett, Jack A.		02234	00001	C.3.4.4	--	--	--
	Beener, Colleen		01311	00002	C.2.1.2	--	--	--
			00074	00001	C.3.4.4	--	--	--
			00074	00004	C.3.1.2	--	--	--
	Berry, John		01100	00001	C.3.4.4	--	--	--
			01100	00004	C.3.4.4	--	--	--
	Bigler, Matt		00277	00003	C.2.4.1	--	--	--
	Black, Calvin		00928	00001	C.3.4.2.1	--	--	--
			00928	00007	C.3.4.3	--	--	--
	Black, Calvin	San Juan County Commission	02185	00006	C.3.4.3	--	--	--
	Black, Calvin		01539	00002	C.3.4.4	--	--	--
			01539	00005	C.3.4.3	--	--	--
			01539	00007	C.3.4.3	--	--	--
			01539	00008	C.3.4.3	--	--	--
	Blair, William	State of Utah	01539	00009	C.3.4.4	--	--	--
			02637	00001A	C.2.3.3	--	--	--
			02637	00001B	C.2.8.2	--	--	--
			02637	00030	C.2.7	--	--	--
			02637	00191	C.3.4.2	--	--	--
			02637	00192	C.3.4.2	--	--	--
			02637	00193	C.3.4.2	--	--	--
			02637	00194	C.3.4.2	--	--	--
	Bleiweiss, David		00142	00001	C.3.4.4	--	--	--
	Boddie, Richard		02239	00001	C.3.4.4	--	--	--
	Bortz, Steve		00934	00002	C.3.1.2	--	--	--
			00934	00003	C.3.1.2	--	--	--
	Boyer, Mark		02230	00001	C.3.4.4	--	--	--
	Broman, Bruce		00542	00001	C.3.1.2	--	--	--
	Brown, Brenda		02242	00001	C.3.1.2	--	--	--
	Brunvand, Amy		00338	00003	C.3.1.2	--	--	--
	Bryan, Julie		00771	00001	C.3.1.2	C.3.1.3	--	--
			00771	00002	C.3.1.2	--	--	--
			00771	00003	C.3.1.2	C.3.1.3	--	--
	Bryan, Julie		01237	00001	C.2.2.1	--	--	--
			01237	00002	C.3.1.2	--	--	--
			01237	00003	C.3.1.2	C.3.1.3	--	--
			01237	00004	C.3.1.2	C.3.1.3	--	--

C.9-177

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Utah (continued)								
	Budig, Michael		00779	00001	C.3.1.2	--	--	--
			00779	00003	C.3.1.2	--	--	--
			00779	00004	C.3.4.4	--	--	--
			00779	00005	C.2.1.1	--	--	--
			00779	00006	C.3.4.4	--	--	--
	Budig, Michael		02206	00001	C.3.1.2	--	--	--
			02206	00002	C.2.1.1	--	--	--
			02206	00003	C.3.4.4	--	--	--
	Budig, Michael	Wasatch Mountain Club	00486	00004	C.3.4.4	--	--	--
			00486	00005	C.3.1.2	--	--	--
	Catlin, James		00785	00001	C.3.1.2	--	--	--
			00785	00004	C.3.1.2	--	--	--
			00785	00005	C.3.1.2	--	--	--
	Catlin, James	Utah Chapter of the Sierra Club	02210	00001	C.3.4.4	--	--	--
			02210	00006	C.3.1.2	--	--	--
	Cederquist, John		00786	00001	C.3.1.2	--	--	--
			00786	00002	C.3.1.2	--	--	--
			00786	00003	C.3.1.2	C.3.1.3	--	--
			00786	00004	C.3.1.2	--	--	--
	Cederquist, John		02211	00001	C.3.1.2	--	--	--
			02211	00002	C.3.1.2	--	--	--
			02211	00003	C.3.1.2	--	--	--
			02211	00004	C.3.1.2	--	--	--
	Chalmers, Diana		01343	00001	C.3.4.4	--	--	--
			01343	00005	C.2.4.1	--	--	--
			01343	00006	C.3.1.2	--	--	--
	Chesler, Bruce		00303	00001	C.3.1.2	--	--	--
			00303	00002	C.3.2	--	--	--
			00303	00008	C.3.2	--	--	--
	Chinn, Doug and Terrie		02662	00001	C.3.4.4	--	--	--
	Clark, Douglas		00541	00001	C.3.1.2	--	--	--
	Coley, Phyllis		00825	00001	C.3.1.2	--	--	--
			00825	00006	C.3.1.2	--	--	--
			00825	00008	C.3.1.2	--	--	--
			00825	00009	C.3.1.2	--	--	--

C.9-178

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Utah (continued)								
	Comstock, Johnston		00826	00002	C.3.1.2	--	--	--
	Connor, Jeff		00740	00001	C.2.8.3	--	--	--
			00740	00002	C.3.1.2	--	--	--
	Cowley, Jill		02231	00001	C.3.1.2	--	--	--
	Crane, Ryan		00791	00001	C.2.8.2	--	--	--
			00791	00002	C.2.8.1	--	--	--
	Cummings, Coreen		00801	00001	C.3.1.2	--	--	--
			00801	00002	C.2.3.3	--	--	--
			00801	00005	C.3.1.2	C.3.1.3	--	--
	Day, Glenn		00736	00001	C.3.4.4	--	--	--
	DeLong, Scott M.		01333	00001	C.3.1.2	--	--	--
			01333	00005	C.3.1.2	--	--	--
		Earth First	01333	00006	C.3.1.2	--	--	--
			00784	00001	C.3.1.2	--	--	--
			00784	00002	C.2.1.1	--	--	--
			00784	00003	C.3.1.2	--	--	--
	Dervage, Sara		00811	00001	C.3.1.2	--	--	--
			00811	00008	C.3.1.2	--	--	--
	Dondero, Thalia M.	Clark Cty. Board of Commisioners	02089	00001	C.2.1.2	--	--	--
	Dorsey, Bryan		00103	00001	C.3.1.2	--	--	--
			00103	00002	C.3.1.2	--	--	--
	Dougherty, Nina		00554	00001	C.3.4.4	--	--	--
	Dudek, Robert		00724	00002	C.3.1.2	--	--	--
	Dudek, Robert A.	Utahns Against the Dump	02095	00002	C.3.1.2	--	--	--
	Duffy, & Hall, Christopher & Brad	Utah State University	01498	00020	C.5.1	C.4.1.2.2	--	--
			01498	00027	C.5.1	C.4.1.2.2	--	--
	Elegante, John C.		00474	00011	C.3.1.2	--	--	--
	Elrod, Dale		01297	00001	C.3.1.2	--	--	--
	Emmerich, Kevin		00090	00001	C.3.4.4	--	--	--
	Erickson, Steve		00776	00001	C.2.6.1	--	--	--
			00776	00002	C.2.1.3	--	--	--
			00776	00003	C.2.6.1	--	--	--
			00776	00004	C.2.4.1	--	--	--
			00776	00005	C.2.1.1	--	--	--
			00776	00006	C.2.6.1	--	--	--
	Ernstsen, Jerriam		02237	00001	C.3.1.2	--	--	--

G.9-179

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah</u> (continued)								
	Evans, David K.		02228	00001	C.2.8.2	--	--	--
			02228	00002	C.2.8.1	--	--	--
	Fawn, Jessica		00731	00001	C.2.1.5	--	--	--
			00731	00003	C.3.4.4	--	--	--
	Flint, Steve		01058	00001	C.3.4.4	--	--	--
			01058	00005	C.2.3.3	--	--	--
	Floor, Jeffrey		00778	00001	C.3.1.2	--	--	--
			00778	00002	C.3.1.2	--	--	--
	Floor, Jeffrey		02205	00001	C.3.1.2	--	--	--
			02205	00002	C.3.1.2	--	--	--
	Frear, Ruth		00792	00001	C.3.1.2	--	--	--
	Frear, Ruth A.		02214	00001	C.3.1.2	--	--	--
			02214	00013	C.3.1.2	--	--	--
	Galbraith, Milton E. & Audrey		00126	00001	C.3.4.4	--	--	--
	Galway, Lewis		00830	00001	C.3.1.2	--	--	--
			00830	00002	C.2.8.2	--	--	--
			00830	00003	C.3.4.4	--	--	--
			00830	00004	C.2.8.2	--	--	--
			00830	00005	C.3.1.2	--	--	--
	Glynn & Breisch, Karen & Stuart		01294	00002	C.3.4.4	--	--	--
			01294	00003	C.2.6.1	--	--	--
			01294	00004	C.3.4.4	--	--	--
	Goff, Robert D.		01350	00001	C.2.7	--	--	--
			01350	00002	C.2.8.2	--	--	--
			01350	00003	C.2.6.1	--	--	--
			01350	00004	C.3.1.2	--	--	--
	Goodtimes, Art		00929	00001	C.3.1.2	--	--	--
			00929	00002	C.3.1.2	--	--	--
			00929	00004	C.3.4.4	--	--	--
	Goodwin, Russ		00759	00001	C.2.3.3	--	--	--
			00759	00002	C.2.3.3	--	--	--
			00759	00003	C.2.8.2	--	--	--
	Goodwin, Russell		01224	00001	C.3.1.2	--	--	--
			01224	00002	C.2.7	--	--	--
			01224	00003	C.3.1.2	--	--	--
			01224	00004	C.2.8.2	--	--	--
	Goodwin, Russell		02194	00001	C.2.3.3	--	--	--
			02194	00002	C.2.3.1	--	--	--

C.9-180

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Utah (continued)								
			02194	00003	C.2.3.3	--	--	--
			02194	00004	C.2.8.1	--	--	--
			02194	00005	C.2.8.2	--	--	--
	Gosselin, Gilles		00744	00001	C.3.4.4	--	--	--
	Graham, Audrey		00741	00001	C.3.1.2	--	--	--
			00741	00004	C.2.8.3	--	--	--
	Graham, Audrey & Tim		01171	00001	C.2.3.3	--	--	--
			01171	00002	C.2.7	--	--	--
			01171	00004	C.2.7	--	--	--
			01171	00005	C.3.1.1	--	--	--
	Graham, Tim		02253	00001	C.3.1.2	--	--	--
	Greenhalgh, Jennifer L.		01582	00003	C.3.1.2	--	--	--
			01582	00004	C.3.1.2	--	--	--
	Greenwalt, Tami R.		00109	00001	C.3.4.4	--	--	--
	Grizzard, James		00757	00001	C.3.1.2	--	--	--
			00757	00002	C.3.1.2	--	--	--
			00757	00004	C.2.3.1	--	--	--
	Guinn, E. P.		00320	00001	C.3.1.2	--	--	--
			00320	00002	C.3.4.4	--	--	--
	Haggard, Lois M.		00460	00001	C.3.4.4	--	--	--
	Harden, et al., R.	Div. of Oil, Gas and Mining	02635	00013	C.2.2	--	--	--
			02635	00014	C.2.3.3	--	--	--
			02635	00040	C.2.1.3	--	--	--
	Harris, L. Kay		02245	00001	C.3.4.4	--	--	--
	Hazen, Gary		00733	00001	C.3.4.4	--	--	--
			00733	00002	C.3.1.2	--	--	--
	Heldon, Karen		00824	00001	C.2.8.2	--	--	--
			00824	00002	C.2.8.2	--	--	--
			00824	00004	C.2.4.2	--	--	--
			00824	00005	C.5.3	C.5.11	--	--
			00824	00008	C.2.1.1	--	--	--
	Henrie, Dr. James Russell		02233	00001	C.3.4.4	--	--	--
	Hollinbeck, Rick		00930	00001	C.3.1.2	--	--	--
	Holly, Troy		00804	00001	C.3.1.2	--	--	--
			00804	00002	C.3.1.2	--	--	--
			00804	00004	C.3.1.2	--	--	--
	Holt, Donna		02251	00001	C.3.4.4	--	--	--
	Howard, Councilman		02090	00001	C.2.1.2	--	--	--

C.9-1B1

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah (continued)</u>								
	Hoyal, Christina H.	Hoyal Construction, Inc.	00108	00001	C.3.4.4	--	--	--
			00108	00002	C.3.1.2	--	--	--
			00108	00004	C.2.8.1	--	--	--
			00108	00005	C.3.4.4	--	--	--
	Hunt, Jeffrey M.		00553	00001	C.3.1.2	--	--	--
	Isenberg, June		00356	00001	C.3.4.4	--	--	--
	Ives, Jeff		01534	00001	C.3.1.2	--	--	--
			01534	00002	C.3.1.2	--	--	--
			01534	00003	C.3.4.4	--	--	--
	Jablouski, Mike		00774	00004	C.3.4.4	--	--	--
			00774	00005	C.3.1.2	--	--	--
	Jacob, Jerry R.		01600	00016	C.2.7	--	--	--
	Jenkins, McDonald, Richard & Vicky		01069	00001	C.3.4.4	--	--	--
	Jensen, Steven		00829	00002	C.3.1.2	--	--	--
			00829	00003	C.2.8.3	--	--	--
			00829	00005	C.2.8.3	--	--	--
			00829	00007	C.3.1.2	--	--	--
			00829	00008	C.3.1.2	--	--	--
			00829	00009	C.3.1.2	--	--	--
			00829	00011	C.3.4.4	--	--	--
			00829	00012	C.3.4.4	--	--	--
	Jewett, Lawrence		00770	00001	C.3.1.2	--	--	--
			00770	00009	C.3.1.2	--	--	--
	Jewett, Lawrence		02202	00001	C.3.2	--	--	--
			02202	00009	C.3.1.2	--	--	--
	Johnson, Michael A.		00614	00001	C.3.4.4	--	--	--
			00614	00002	C.3.4.4	--	--	--
			00614	00003	C.2.4.1	--	--	--
			00614	00008	C.3.1.2	--	--	--
	Jorgensen, David M.		00552	00001	C.3.2	--	--	--
			00552	00004	C.2.2.1	--	--	--
			00552	00005	C.3.1.2	--	--	--
	Jorgensen, David		00828	00001	C.3.1.2	--	--	--
			00828	00003	C.3.1.2	--	--	--
			00828	00004	C.3.1.2	--	--	--
			00828	00006	C.3.1.2	--	--	--
	Karkut, James		00805	00001	C.2.3.1	--	--	--
			00805	00002	C.3.2	--	--	--

G.9-182

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah (continued)</u>								
	Kelleher, Mark	Grand Co. Econ. Dev. Council	00805	00007	C.3.4.4	--	--	--
	Kelling, Mitch		02249	00001	C.3.4.4	--	--	--
	Kinnersley, Blanche		00009	00001	C.2.1.1	--	--	--
	Kirschner, Mike		02219	00001	C.3.4.4	--	--	--
			02219	00005	C.3.1.2	--	--	--
			00813	00001	C.3.1.2	--	--	--
			00813	00007	C.3.1.2	--	--	--
	Klinkenberg, Chris M.		02247	00001	C.3.4.4	--	--	--
	Knight, Charlotte		00777	00002	C.2.1.2	--	--	--
			00777	00003	C.2.5.1	--	--	--
	Kobler, Mary Alyce	00777	00004	C.3.1.2	--	--	--	
		00809	00001	C.2.8.3	--	--	--	
		00809	00004	C.3.4.4	--	--	--	
		00809	00005	C.2.4.1	--	--	--	
		00809	00008	C.3.1.2	--	--	--	
	Krueger, Heather	00823	00001	C.3.1.2	--	--	--	
		00823	00003	C.2.4.1	--	--	--	
		00823	00006	C.3.1.2	--	--	--	
		00823	00011	C.2.5.2	--	--	--	
		00823	00012	C.2.5.2	--	--	--	
	Lavalle, Lance	00822	00005	C.3.1.2	--	--	--	
	Lehman, Dale	00933	00001	C.2.1.1	--	--	--	
		00933	00002	C.3.1.2	--	--	--	
	Lehmann, Diane	00832	00001	C.3.1.2	--	--	--	
		00832	00002	C.2.8.3	--	--	--	
	Levine, Deborah	00767	00001	C.3.1.2	--	--	--	
		00767	00002	C.3.1.1	--	--	--	
		00767	00003	C.3.1.1	--	--	--	
		00767	00006	C.2.7	--	--	--	
	Levine, Deborah	02201	00001	C.3.1.2	--	--	--	
		02201	00002	C.2.3	--	--	--	
		02201	00003	C.2.3	--	--	--	
		02201	00006	C.7.3	--	--	--	
	Lewis, Andy	00810	00001	C.3.1.2	--	--	--	
		00810	00006	C.3.1.2	--	--	--	
		00810	00008	C.2.8.1	--	--	--	
		00810	00009	C.3.1.2	--	--	--	
	Lindgren, Eric	00821	00009	C.3.1.2	--	--	--	

C.9-183

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah (continued)</u>								
	Lindgren, Kim		02235	00001	C.3.4.4	--	--	--
	Linn, Jeanie M		01172	00006	C.3.1.2	--	--	--
	Liverman, Dr. D. H.		02636	00001	C.2.4.1	--	--	--
			02636	00002	C.2.4.1	--	--	--
			02636	00003	C.2.4.1	--	--	--
			02636	00004	C.2.4.1	--	--	--
			02636	00005	C.2.4.1	--	--	--
			02636	00006	C.2.4.1	--	--	--
			02636	00007	C.2.4.1	--	--	--
			02636	00008	C.2.4.1	--	--	--
			02636	00009	C.2.4.1	--	--	--
			02636	00010	C.2.4.1	--	--	--
			02636	00011	C.2.4.1	--	--	--
			02636	00012	C.2.4.1	--	--	--
			02636	00013	C.2.4.1	--	--	--
			02636	00014	C.2.4.1	--	--	--
			02636	00015	C.2.4.1	--	--	--
			02636	00016	C.2.4.1	--	--	--
			02636	00017	C.2.4.1	--	--	--
			02636	00018	C.2.4.1	--	--	--
			02636	00019	C.2.4.1	--	--	--
			02636	00020	C.2.4.1	--	--	--
			02636	00021	C.2.4.1	--	--	--
			02636	00022	C.2.4.1	--	--	--
			02636	00023	C.2.4.1	--	--	--
			02636	00024	C.2.4.1	--	--	--
			02636	00025	C.2.4.1	--	--	--
			02636	00026	C.2.4.1	--	--	--
	Lockhart, William		00761	00001	C.3.1.2	--	--	--
			00761	00003	C.7.5	--	--	--
			00761	00012	C.3.1.2	--	--	--
	Lockhart, William		01261	00006	C.3.1.2	--	--	--
			01261	00010	C.2.1.1	--	--	--
			01261	00013	C.3.1.2	--	--	--
			01261	00014	C.3.4.3	--	--	--
			01261	00015	C.3.4.3	--	--	--
			01261	00016	C.3.4.3	--	--	--
			01261	00017	C.3.4.3	--	--	--

C.9-184

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Utah (continued)								
	Lockhart, William		02196	00003	C.7.2	--	--	--
			02196	00008	C.5.1	--	--	--
			02614	00001	C.3.4.3	--	--	--
			02614	00002	C.3.4.3	--	--	--
			02614	00003	C.3.4.3	--	--	--
			02614	00004	C.3.4.3	--	--	--
			02614	00005	C.3.4.3	--	--	--
			02614	00006	C.3.4.3	--	--	--
			02614	00007	C.3.4.3	--	--	--
			02614	00008A	C.3.4.4	--	--	--
			02614	00008B	C.3.4.3	--	--	--
			02614	00008C	C.3.4.4	--	--	--
			02614	00008D	C.3.4.2	--	--	--
			02614	00008E	C.3.1.1	--	--	--
			02614	00008F	C.3.4.3	--	--	--
			02614	00008G	C.3.4.3	--	--	--
		02614	00008H	C.3.4.3	--	--	--	
	Lumdahl, Cordell		02614	00009	C.3.4.3	--	--	--
			00768	00001	C.3.4.4	--	--	--
		00768	00002	C.2.4.2	--	--	--	
	Lusk, Mark W.		00063	00001	C.3.4.4	--	--	--
	Lyon, Thomas J.		00252	00001	C.3.1.2	--	--	--
	Mangum, Todd		00797	00001	C.3.1.2	--	--	--
	Mangum, Todd		02215	00001	C.3.1.2	--	--	--
	Martin, Terri		00760	00001	C.3.4.4	--	--	--
	Mason, Patrice		00742	00001	C.3.4.4	--	--	--
	Matheson, Scott M.	Utahns for Canyonlands	01235	00001	C.2.1.1	--	--	--
			01235	00002	C.3.1.2	--	--	--
			01235	00003	C.3.4.4	--	--	--
			01235	00004	C.2.6.1	--	--	--
			01235	00005	C.2.4.3	--	--	--
			01235	00006	C.3.1.2	--	--	--
			01235	00010	C.2.4.1	--	--	--
			01235	00024	C.3.1.2	--	--	--
			01235	00025	C.2.3.3	--	--	--
			01235	00026	C.2.4.2	--	--	--

C.9-185

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah</u> (continued)								
			01235	00027	C.2.5.2	--	--	--
			01235	00028	C.2.6.1	--	--	--
			01235	00029	C.2.1.1	--	--	--
			01235	00030	C.3.1.2	--	--	--
			01235	00031	C.3.1.2	--	--	--
			01235	00032	C.2.7	--	--	--
			01235	00035	C.3.1.2	--	--	--
			01235	00037	C.2.3.1	--	--	--
			01235	00038	C.2.2.1	--	--	--
			01235	00039	C.3.4.4	--	--	--
			01235	00040	C.2.1.1	--	--	--
			01235	00041	C.3.1.2	--	--	--
	Matheson, Scott M.		02189	00002	C.3.1.2	--	--	--
			02189	00003	C.3.1.2	--	--	--
			02189	00004	C.3.1.2	--	--	--
			02189	00005	C.2.1.2	--	--	--
			02189	00010	C.2.3.1	--	--	--
			02189	00011	C.2.2.1	--	--	--
			02189	00012	C.3.4.4	--	--	--
			02189	00013	C.2.1.1	--	--	--
			02189	00014	C.3.1.2	--	--	--
	Matis, Lew		00922	00001	C.3.4.4	--	--	--
			00922	00002	C.3.1.2	--	--	--
	Maxfield, Cory		00803	00001	C.3.1.2	--	--	--
			00803	00002	C.3.4.4	--	--	--
			00803	00003	C.2.4.1	--	--	--
			00803	00006	C.2.3.3	--	--	--
			00803	00007	C.3.1.2	--	--	--
			00803	00010	C.3.1.2	--	--	--
			00803	00011	C.2.5.2	--	--	--
			00803	00012	C.3.1.2	--	--	--
	Maxfield, Cory		02218	00001	C.3.1.2	--	--	--
			02218	00002	C.3.4.4	--	--	--
			02218	00005	C.2.3.3	--	--	--
	Mazurski, Madeline		01117	00001	C.3.1.2	--	--	--
			01117	00003	C.3.1.2	--	--	--
	McCarrick, J. E.		02224	00002	C.2.8.1	--	--	--
			02224	00003	C.2.8.2	--	--	--

C.9-186

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION				
					FIRST	SECOND	THIRD	FOURTH	
<u>Utah (continued)</u>									
			02224	00007	C.3.4.4	--	--	--	
			02224	00008	C.2.8.2	--	--	--	
			02224	00010	C.3.4.4	--	--	--	
	McCawley, Dr. Paul F.		02229	00002	C.3.1.2	--	--	--	
			02229	00003	C.3.4.4	--	--	--	
	McClatchy, Millie		00748	00002	C.2.4.1	--	--	--	
			00748	00005	C.3.4.4	--	--	--	
	McCool, Lewis		00925	00001	C.3.4.4	--	--	--	
			00925	00004	C.3.1.1	--	--	--	
	McGraw, Don		00366	00006A	C.3.1.1	--	--	--	
			00366	00006B	C.2.4.2	--	--	--	
	McGraw, Don		00807	00016	C.3.1.1	--	--	--	
			00807	00017	C.3.4.3	--	--	--	
			00807	00019	C.2.8.2	--	--	--	
			00807	00020	C.2.8.1	--	--	--	
	McGraw, Don	Physics Department	02220	00012	C.3.2	--	--	--	
			02220	00016	C.2.2	--	--	--	
			02220	00017	C.2.2	--	--	--	
			02220	00019	C.2.8.2	--	--	--	
			02220	00020	C.2.8.1	--	--	--	
	Meehan, William A.		02208	00001	C.3.1.2	--	--	--	
	Merrell, Harvey		00734	00001	C.3.1.2	--	--	--	
			00734	00002	C.3.4.3	--	--	--	
			00734	00003	C.3.1.2	--	--	--	
			00734	00004	C.3.4.2.1	--	--	--	
			00734	00005	C.3.4.2.1	--	--	--	
			00734	00008	C.3.4.2.1	--	--	--	
			00734	00009	C.3.4.2	--	--	--	
			00734	00010	C.3.4.2.2	--	--	--	
			00734	00011	C.3.4.2.2	--	--	--	
			00734	00012	C.3.4.3	--	--	--	
	Merrell, Harvey W.		01541	00002	C.3.4.1	--	--	--	
			01541	00003	C.3.4.1	--	--	--	
			01541	00004	C.3.4.1	--	--	--	
			01541	00005	C.3.4.1	--	--	--	
			01541	00006	C.3.4.1	--	--	--	
			01541	00007	C.3.4.1	--	--	--	
			01541	00008	C.3.4.1	--	--	--	

C.9-187

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah</u> (continued)								
			01541	00009	C.3.4.1	--	--	--
			01541	00010	C.3.4.1	--	--	--
			01541	00011	C.3.4.2.1	--	--	--
			01541	00012	C.3.4.2.1	--	--	--
			01541	00013	C.3.4.2.1	--	--	--
			01541	00014	C.3.4.2.1	--	--	--
			01541	00015	C.3.4.2.2	--	--	--
			01541	00016	C.3.4.2.2	--	--	--
			01541	00017	C.3.4.2.3	--	--	--
			01541	00018	C.3.4.2.3	--	--	--
			01541	00019	C.3.4.2.3	--	--	--
			01541	00020	C.3.4.2.3	--	--	--
			01541	00021	C.3.4.3	--	--	--
			01541	00022	C.3.4.3	--	--	--
	Merrell, Harvey W.		01542	00001	C.3.4.1	--	--	--
			01542	00002	C.3.4.1	--	--	--
			01542	00003	C.3.4.1	--	--	--
			01542	00004	C.3.4.1	--	--	--
			01542	00005	C.3.4.1	--	--	--
			01542	00006	C.3.4.2.1	--	--	--
			01542	00007	C.3.4.2.3	--	--	--
			01542	00008A	C.3.4.2.1	--	--	--
			01542	00008B	C.3.4.2.1	--	--	--
			01542	00009	C.3.4.2.2	--	--	--
			01542	00010	C.3.4.2.3	--	--	--
			01542	00011	C.3.4.2.3	C.3.4.3	--	--
			01542	00012	C.3.4.2.3	--	--	--
			01542	00013	C.3.4.2.3	--	--	--
			01542	00014	C.3.4.3	--	--	--
			01542	00015	C.3.4.3	--	--	--
	Merrell, Harvey W.		01543	00001	C.2.7	--	--	--
	Merrell, Harvey W.		01544	00001	C.3.4.3	--	--	--
			01544	00002	C.3.4.3	--	--	--
			01544	00003	C.3.4.3	--	--	--
			01544	00004	C.3.4.3	--	--	--
			01544	00005	C.3.4.3	--	--	--
			01544	00006	C.3.4.3	--	--	--
			01544	00007	C.3.4.2.1	--	--	--

C-9-188

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah (continued)</u>								
			01544	00008	C.3.4.2.2	C.3.4.3	--	--
			01544	00009	C.3.4.2.2	--	--	--
			01544	00010	C.3.4.2.2	--	--	--
			01544	00011	C.3.4.3	--	--	--
	Merrell, Harvey W.		01545	00001	C.3.4.3	--	--	--
			01545	00002	C.3.4.2.3	--	--	--
			01545	00007	C.2.7	--	--	--
			01545	00009	C.2.7	--	--	--
			01545	00019	C.3.4	--	--	--
	Merrell, Harvey W.		02099	00001	C.3.1.2	--	--	--
			02099	00002	C.3.4.3	--	--	--
			02099	00003	C.3.1.2	--	--	--
			02099	00004	C.3.4.3	--	--	--
			02099	00005	C.3.4.2.1	--	--	--
			02099	00006	C.3.4.2	--	--	--
			02099	00007	C.3.4.2	--	--	--
			02099	00008	C.3.4.2.1	--	--	--
			02099	00009	C.3.4.2	--	--	--
			02099	00011	C.3.4.2.2	--	--	--
			02099	00012	C.3.4.2.3	--	--	--
			02099	00013	C.3.4.2.3	--	--	--
			02099	00014	C.3.4.3	--	--	--
			02099	00015	C.3.4.3	--	--	--
	Minix, Casey		00790	00001	C.3.1.2	--	--	--
	Mitchell, Dr. Jerry K.		00301	00001	C.3.1.2	--	--	--
			00301	00002	C.3.1.2	--	--	--
			00301	00007	C.3.1.2	--	--	--
	Mitchell, Pat		00339	00003	C.2.1.1	--	--	--
	Montrose, K. Hugh		02091	00001	C.2.1.2	--	--	--
	Moorehead, Jeffrey		00932	00001	C.3.1.2	--	--	--
			00932	00002	C.3.1.2	--	--	--
	Morrison, Stan		00127	00001A	C.2.8.3	--	--	--
	Moseley, Mica		00467	00001	C.3.4.4	--	--	--
	Mulvey, William E.		02232	00001	C.3.4.4	--	--	--
	Mulvey, Debra Dellinger		02241	00001	C.3.4.4	--	--	--
	Nelson, Roger N.		02248	00001	C.3.4.4	--	--	--
	Newman, Mr. & Mrs. A. O.		00005	00001	C.3.4.4	--	--	--

G-9-189

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah</u> (continued)								
	Nichols, Amber		00831	00001	C.3.1.2	--	--	--
			00831	00002	C.3.1.2	--	--	--
	Norcross, Frances		00806	00001	C.3.1.2	--	--	--
			00806	00002	C.3.2	--	--	--
			00806	00004	C.3.1.2	--	--	--
	Norman, Robert		00728	00001	C.3.4.3	--	--	--
			00728	00002	C.3.4.1	--	--	--
			00728	00003	C.3.4.2.1	--	--	--
			00728	00005	C.3.4.2.3	--	--	--
			00728	00006	C.3.4.2.2	--	--	--
			00728	00008	C.3.4.3	--	--	--
			00728	00009	C.3.4.3	--	--	--
			00728	00010	C.8.2	C.3.4.1	--	--
			00728	00011	C.8.2	C.3.4.1	--	--
	Norman, Robert R.		02098	00001	C.3.4.3	--	--	--
			02098	00002	C.3.4.1	--	--	--
			02098	00003	C.3.4.2.1	--	--	--
			02098	00004	C.3.4.2.2	--	--	--
			02098	00005	C.3.4.2.3	--	--	--
			02098	00006	C.3.4.2.2	--	--	--
			02098	00008	C.3.4.3	--	--	--
	Norman, Robert C.	Buttes Resources Company	00132	00001	C.3.4.3	--	--	--
	Nystrom, Jarl B		01348	00001	C.3.4.4	--	--	--
			01348	00006	C.2.5.1	--	--	--
			01348	00008	C.2.1.1	--	--	--
	O'Connell, Jean, Peter & Timothy		00021	00001	C.3.4.4	--	--	--
	O'Neill, Janet Taylor		00088	00001	C.3.4.4	--	--	--
	Olshansky, S. Jay	University of Utah	01540	00019	C.3.4.3	--	--	--
			01540	00020	C.3.4.3	--	--	--
			01540	00021	C.3.4.3	--	--	--
			01540	00022	C.3.4.3	--	--	--
			01540	00023	C.3.4.3	--	--	--
	Oram, Debbie		01344	00001	C.3.1.2	--	--	--
			01344	00002	C.2.4.1	--	--	--
		Utahns Against the Dump	01340	00003	C.2.4.1	--	--	--
			01340	00004	C.2.4.1	--	--	--
			01340	00005	C.2.4.1	--	--	--
			01340	00006	C.2.8.3	--	--	--

C.9-190

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Utah (continued)								
	Oviatt, Susan		00627	00004	C.3.1.2	--	--	--
	Oviatt, Charles G.		00628	00004	C.3.1.2	--	--	--
	Oviatt, Jack		02236	00001	C.3.4.4	--	--	--
	Oviatt, Susan		02238	00001	C.3.4.4	--	--	--
	Pass, Merlin R.		01242	00001	C.3.1.2	--	--	--
			01242	00027	C.3.1.2	--	--	--
	Paterson & Jensen, Danielle & Margie		01140	00001	C.2.3	--	--	--
			01140	00002	C.3.1.2	--	--	--
			01140	00003	C.2.3	--	--	--
	Paul, Stephen E.		02243	00001	C.3.4.4	--	--	--
	Peterson, Dr. F. Ross		02226	00001	C.3.4.4	--	--	--
	Petition		02100	00001	C.3.1.2	--	--	--
		Don't Waste Utah Campaign	01118	00001	C.3.4.4	--	--	--
	Pettis, Margaret		00772	00001	C.3.4.4	--	--	--
			02203	00001	C.3.1.2	--	--	--
	Pickere11, Loretta		00753	00001	C.2.3.3	--	--	--
			00753	00002	C.3.1.2	--	--	--
	Pickere11, Loretta		01264	00001	C.2.1.1	--	--	--
			01264	00004	C.3.1.2	--	--	--
			01264	00005	C.3.1.2	--	--	--
			01264	00006A	C.3.1.2	C.3.1.3	--	--
			01264	00007	C.3.1.2	--	--	--
	Pickere11, Loretta	Wilderness Society, Sierra Club	02191	00001	C.2.3.1	--	--	--
			02191	00002	C.2.3.1	--	--	--
			02191	00025	C.2.4.1	--	--	--
	Plenk, Bruce		00787	00003	C.3.4.4	C.2.4.1	--	--
	Pomble, David		00796	00001	C.3.1.2	--	--	--
			00796	00002	C.3.1.2	--	--	--
	Raines, Paula		00814	00001	C.3.1.2	C.3.1.3	--	--
			00814	00007	C.2.4.1	--	--	--
			00814	00010	C.3.1.2	--	--	--
	Raines, Paula		00818	00001	C.3.1.2	--	--	--
	Rayle, Craig		00812	00001	C.3.1.2	--	--	--
			00812	00002	C.3.1.2	--	--	--
			00812	00003	C.3.4.4	--	--	--
			00812	00004	C.3.4.4	--	--	--
			00812	00005	C.3.1.2	--	--	--

C.9-191

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah (continued)</u>								
	Redd, Mayor Keith		00931	00001	C.3.4.3	--	--	--
			00931	00002	C.3.4.2.1	--	--	--
			00931	00003	C.3.4.2.3	--	--	--
	Reece, Ron	Utah Audubon Society	00931	00004	C.7.3	--	--	--
			02114	00001	C.3.1.2	--	--	--
			02114	00005	C.3.1.3	--	--	--
			02114	00006	C.2.7	--	--	--
	Relling, Mary V.		02256	00001	C.3.1.2	--	--	--
	Richardson and Fam., Reed C.		00464	00001	C.3.4.4	--	--	--
	Riley, Brent		00729	00001	C.3.4.4	--	--	--
			00756	00001	C.3.1.2	--	--	--
			00756	00002	C.3.1.1	--	--	--
			00756	00003	C.3.1.3	--	--	--
	Riley, Brent	ROCPAC	01391	00011	C.3.2	C.3.2	--	--
			01391	00012	C.2.1.1	--	--	--
			01391	00013	C.2.8.2	--	--	--
			01391	00014	C.2.8.2	--	--	--
			01391	00015	C.2.8.2	--	--	--
			01391	00016	C.2.8.2	--	--	--
			01391	00017	C.2.8.2	--	--	--
	Roach, Josephine R.		00114	00001	C.3.4.4	--	--	--
			00114	00002	C.3.4.4	--	--	--
	Rodine, Gene		02118	00006	C.2.7	--	--	--
			02118	00008	C.2.7	--	--	--
			02118	00009	C.2.7	--	--	--
			02118	00013	C.2.7	--	--	--
			02118	00014	C.2.7	--	--	--
			02118	00016	C.2.7	--	--	--
			02118	00017	C.2.7	--	--	--
			02118	00018	C.2.7	--	--	--
			02118	00019	C.2.7	--	--	--
			02118	00021	C.2.7	--	--	--
			02118	00024	C.2.7	--	--	--
			02118	00026	C.2.7	--	--	--
			02118	00031	C.2.7	--	--	--
			02118	00033	C.2.7	--	--	--
			02118	00036	C.2.7	--	--	--
			02118	00046	C.2.7	--	--	--

G.9-192

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Utah (continued)								
			02118	00047	C.2.7	--	--	--
			02118	00049	C.2.7	--	--	--
			02118	00050	C.2.7	--	--	--
	Rogers, Lester		00721	00001	C.3.4.1	--	--	--
			00721	00002	C.3.4.3	--	--	--
			00721	00003	C.3.4.3	--	--	--
			00721	00004	C.3.4.3	--	--	--
			00721	00005	C.3.4.3	--	--	--
			00721	00006	C.3.4.3	--	--	--
	Rogers, Laura		00754	00002A	C.3.4.4	--	--	--
			00754	00002B	C.3.4.4	--	--	--
			00754	00003	C.3.4.3	--	--	--
			00754	00004	C.2.4.1	--	--	--
	Rogers, Lester W.		02088	00001	C.3.4.1	--	--	--
			02088	00002	C.3.4.1	--	--	--
			02088	00003	C.3.4.1	--	--	--
			02088	00004	C.3.4.3	--	--	--
			02088	00005	C.3.4.3	--	--	--
			02088	00006	C.3.4.3	--	--	--
	Rogers, Laura		02192	00001	C.3.1.2	--	--	--
			02192	00002	C.3.1.2	--	--	--
			02192	00003	C.3.4.3	--	--	--
			02192	00004	C.2.4.1	--	--	--
	Rogers, Lester W.	Rogers Roost Service	01251	00001	C.2.4.1	--	--	--
	Rogers, Lester & Margie		01252	00001	C.3.1.2	--	--	--
			01252	00005	C.3.1.2	--	--	--
	Ross, Janet	Dir. Windsong Wilderness Exped.	00620	00003	C.3.4.4	--	--	--
	Rouzer, Dr. Steven V.		00243	00002	C.3.1.2	--	--	--
	Roybal/Parsons, Christy/Davis		02710	00001	C.3.4.4	--	--	--
			02710	00002	C.2.8.1	--	--	--
	Salt, Jeff		00820	00001	C.3.1.2	--	--	--
			00820	00002	C.3.1.2	--	--	--
			00820	00003	C.3.1.2	C.3.1.3	--	--
			00820	00004	C.3.1.2	--	--	--
			00820	00006	C.3.1.2	--	--	--
			00820	00007	C.2.3.1	--	--	--
			00820	00008	C.3.1.2	--	--	--
	Schmidt, Jerry		00802	00001	C.3.1.2	--	--	--

C.9-193

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah (continued)</u>								
			00802	00002	C.2.1.1	--	--	--
			00802	00003	C.3.4.4	--	--	--
			00802	00004	C.3.4.4	--	--	--
			00802	00005	2.3.1	--	--	--
			00802	00006	C.2.3.2	--	--	--
			00802	00007	C.3.4.4	--	--	--
			00802	00008	C.3.4.4	--	--	--
	Schultz, George	Chinle Associates	01086	00001	C.2.1.1	--	--	--
			01086	00003	C.3.4.3	--	--	--
			01086	00004	C.6.4	--	--	--
			01086	00007	C.3.4.4	--	--	--
			01086	00008	C.3.4.4	C.7.3	--	--
	Seed, Deeda		00758	00001	C.3.1.2	--	--	--
	Severance, Owen		00258	00005	C.2.1.1	--	--	--
	Sharpsteen, Catherine		00077	00001	C.3.1.2	--	--	--
	Siegenderf, Lloyd & Mary Anne		02246	00001	C.3.4.4	--	--	--
	Slade, Joe		00926	00001	C.3.4.4	--	--	--
			02183	00001	C.3.4.4	--	--	--
			02183	00008	C.7.4.2	--	--	--
	Sleight, Ken		00722	00001	C.2.8.3	--	--	--
			00722	00002	C.2.4.1	--	--	--
	Sleight, Ken	Ken Sleight Expeditions	02094	00001	C.2.7	--	--	--
			02094	00002	C.2.4.1	--	--	--
	Smith, Del		02225	00001	C.3.4.4	--	--	--
	Smith, Marshall & Margene		01580	00001	C.3.1.2	--	--	--
	Snow, Carl		00751	00002	C.3.1.2	--	--	--
			00751	00003	C.3.1.2	--	--	--
			00751	00004	C.3.1.2	--	--	--
			00751	00005	C.2.7	--	--	--
			00751	00009	C.2.4.1	--	--	--
			00751	00010	C.2.3.1	--	--	--
			00751	00011	C.2.2.1	--	--	--
			00751	00012	C.3.4.4	--	--	--
			00751	00013	C.2.1.1	--	--	--
			00751	00014	C.3.1.2	--	--	--
	Snythe, Stewart		00808	00001	C.3.4.4	--	--	--
	Spence, Jack		00763	00001	C.2.8.2	--	--	--
			00763	00004	C.3.1.2	--	--	--

C.9-194

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Utah (continued)								
	Spence, Jean		01130	00001	C.3.1.2	--	--	--
	Spence, Jack T.		02197	00001	C.2.8.2	--	--	--
			02197	00004	C.3.1.2	--	--	--
	Stark, Douglas		01296	00001	C.2.4.1	--	--	--
			01296	00002	C.2.3.3	--	--	--
			01296	00003	C.2.1.1	--	--	--
			01296	00004	C.3.4.4	--	--	--
			01296	00005	C.3.4.3	--	--	--
			01296	00005A	C.3.4.4	--	--	--
			01296	00012	C.3.4.4	--	--	--
	Steckel, Alex		00475	00001	C.3.1.2	--	--	--
			00475	00004	C.2.8	--	--	--
	Stocks, Joe		00116	00001	C.3.4.4	--	--	--
			00116	00006	C.3.4.4	--	--	--
			00116	00007	C.3.4.4	--	--	--
			00116	00008	C.3.4.4	--	--	--
			00116	00010	C.3.4.4	--	--	--
	Stocks, Mayor Tom		00720	00002	C.3.4.2.2	--	--	--
			00720	00004	C.3.4.2.2	--	--	--
			00720	00005	C.3.4.3	--	--	--
			00720	00006	C.3.4.1	--	--	--
	Sussman, Deborah		01317	00001	C.3.1	--	--	--
	Terrana, Phyllis		00834	00002	C.2.8.3	--	--	--
			00834	00003	C.3.1.2	--	--	--
			00834	00004	C.3.1.2	--	--	--
			00834	00005	C.2.4.1	--	--	--
			00834	00007	C.3.4.4	--	--	--
	Terrana, Phyllis		01531	00001	C.3.1.2	--	--	--
			01531	00002	C.3.1.2	--	--	--
			01531	00005	C.2.4.1	--	--	--
			01531	00006	C.3.1.2	--	--	--
	Thompson, Patricia		00775	00001	C.3.1.2	C.3.1.3	--	--
			00775	00004	C.3.1.2	C.3.1.3	--	--
	Thompson-Hanson, Patricia A.		02204	00001	C.3.1.3	C.3.1.3	--	--
			02204	00004	C.2.2.2	--	--	--
			02204	00005	C.3.2	--	--	--
	Thurman, Dr. David J.	Physicians for Social Resp.	01054	00001	C.2.7	--	--	--
			01054	00002	C.2.1.1	--	--	--

C.0-195

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah</u> (continued)								
			01054	00003	C.3.1.2	--	--	--
			01054	00004	C.2.4.1	--	--	--
			01054	00005	C.3.1.2	--	--	--
	Till, Thomas		00732	00001	C.3.4.3	--	--	--
			00732	00002	C.3.1.2	--	--	--
			00732	00004	C.3.1.2	--	--	--
	Tippets, Terry		00789	00001	C.3.1.2	--	--	--
			00789	00002	C.3.1.2	--	--	--
			00789	00003	C.3.4.4	--	--	--
	Trittschuh, Travis		00738	00001	C.3.4.4	--	--	--
			00738	00002	C.2.4.1	--	--	--
			00738	00005	C.2.5.2	--	--	--
	Turner, Barbara		02244	00001	C.3.4.4	--	--	--
	Valdez, Richard		00766	00002	C.2.1.3	--	--	--
	Valdez, Dr. Richard A.		02200	00002	C.2.1.2	--	--	--
	Van Frank, Alison		00799	00002	C.3.2	--	--	--
	Van Frank, Alison		02259	00003	C.3.4.4	--	--	--
	Van Gundy, Douglas		00755	00001	C.3.1.2	--	--	--
			00755	00006	C.3.1.2	--	--	--
	Van Gundy, Douglas A.		02193	00001	C.3.1.2	--	--	--
			02193	00006	C.3.1.2	--	--	--
	Velez, Valerie S.		02207	00001	C.3.1.2	--	--	--
			02207	00002	C.3.1.2	--	--	--
			02207	00003	C.3.1.2	--	--	--
	Veliz, Valerie		00780	00001	C.3.1.2	--	--	--
			00780	00002	C.3.1.2	--	--	--
			00780	00003	C.3.1.2	--	--	--
	Walker, Grady		00788	00001	C.3.1.2	C.3.1.3	--	--
			00788	00002	C.3.1.2	--	--	--
			00788	00008	C.3.2	--	--	--
			00788	00009	C.3.4.4	--	--	--
			00788	00010	C.2.8.1	--	--	--
	Walker, Carol		00800	00001	C.2.4.3	--	--	--
			00800	00002	C.2.4.3	--	--	--
			00800	00003	C.3.1.2	--	--	--
			00800	00004	C.3.1.1	--	--	--
			00800	00005	C.3.1.2	--	--	--
			00800	00006	C.3.1.2	--	--	--

C.9-196

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION				
					FIRST	SECOND	THIRD	FOURTH	
Utah (continued)									
	Walker, Carol		00800	00007	C.2.4.1	--	--	--	
			01065	00001	C.3.4.4	--	--	--	
			01065	00002	C.3.1.2	--	--	--	
			01065	00003	C.3.4.4	--	--	--	
			01065	00004	C.3.1.2	--	--	--	
			01065	00005	C.3.1.2	--	--	--	
			01065	00006	C.3.1.2	--	--	--	
			01065	00008	C.2.3.3	--	--	--	
			01065	00009	C.2.3.3	--	--	--	
			01065	00010	C.3.4.4	--	--	--	
			01065	00011	C.3.4.4	--	--	--	
	Walker, Grady		02212	00001	C.3.2	--	--	--	
			02212	00002	C.3.1.2	--	--	--	
			02212	00008	C.3.2	--	--	--	
			02212	00009	C.3.4.4	--	--	--	
			02212	00010	C.3.4.4	C.2.8.1	--	--	
	Walker, Mrs. C. Barry		02217	00001	C.3.1.2	--	--	--	
			02217	00002	C.3.1.2	--	--	--	
			02217	00003	C.3.1.2	--	--	--	
			02217	00004	C.2.2	--	--	--	
			02217	00005	C.3.1.2	--	--	--	
			02217	00006	C.2.3.3	--	--	--	
			02217	00007	C.3.1.2	--	--	--	
			02217	00008	C.3.4.4	--	--	--	
			02217	00008	C.3.4.4	--	--	--	
	Walker, Jimmie	County Commissioner	02096	00001	C.2.1.1	--	--	--	
				02096	00002	C.3.4.4	--	--	--
				02096	00003	C.3.4.2.1	C.3.4.3	--	--
				02096	00005	C.3.4.3	--	--	--
				02096	00007	C.3.4.4	--	--	--
	Wallace, Matthew H.		00124	00001	C.2.3.3	--	--	--	
	Wallace, Anne		00451	00001	C.3.4.4	--	--	--	
	Warnick, Rick		00783	00001	C.3.1.2	C.3.1.3	--	--	
			00783	00002	C.3.1.2	C.3.1.3	--	--	
			00783	00007	C.3.1.2	--	--	--	
			00488	00012	C.3.1.2	--	--	--	
	Warnick, Richard M. Warnick, Rich	Utah Wilderness Association	02209	00001	C.3.2	--	--	--	
				02209	00016	C.3.2	--	--	--
				02209	00017	C.3.1.2	--	--	--
				02209	00017	C.3.1.2	--	--	--

C.9-197

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Utah</u> (continued)								
	Werzinski, Ronald		00816	00001	C.3.1.2	--	--	--
	White, Mrs. Don		00816	00002	C.2.1.1	--	--	--
			00002	00001	C.2.1.1	--	--	--
			00002	00002	C.2.1.1	--	--	--
	White, Adair		00727	00001	C.4.1.5	C.2.1.5	--	--
	White, Adell		02097	00001	C.7.4	--	--	--
			02097	00003	C.3.4.2.2	--	--	--
	Wiggans, Tamara		00924	00004	C.3.2	--	--	--
			00924	00005	C.3.2	--	--	--
	Wilburn, Margaret		01055	00001	C.3.1.2	--	--	--
	Wilcox, James		01057	00001	C.3.4.4	--	--	--
	Willigan, J. Dennis		00765	00002	C.3.4.4	--	--	--
	Willigan, Dr. J. Dennis	The University of Utah	00120	00002	C.3.4.2.2	--	--	--
			00120	00004	C.3.4.2.2	--	--	--
	Willigan, Dr. J. Dennis	University of Utah	02199	00002	C.3.1.2	--	--	--
	Wilson, Mayor Ted L.	Salt Lake City Corporation	02190	00001	C.3.1.2	--	--	--
	Wolfe, Michael		01314	00001	C.3.1.2	--	--	--
	Wright, Marilyn M.		00455	00001	C.3.4.4	--	--	--
	Young, Marianna		01295	00001	C.3.1.2	--	--	--
			01295	00007	C.3.4.4	--	--	--
	Zaccardi, Mike		00819	00001	C.3.1.2	--	--	--
			00819	00002	C.2.8.1	--	--	--
			00819	00004	C.3.1.2	--	--	--
	Zimmerman, John		00726	00001	C.3.4.2	--	--	--
			00726	00002	C.3.4.2.1	C.3.4.3	--	--
			00726	00005	C.3.4.3	--	--	--
<u>Vermont</u>								
	Elton, Wallace		01070	00001	C.3.1.2	--	--	--
<u>Virginia</u>								
	Hotchkiss, Mr. & Mrs. C.T.		00061	00001	C.3.4.4	--	--	--
	Mueller, Robert F.		02607	00001	C.3.4.4	--	--	--
			02607	00003	C.3.4.4	--	--	--
	Pettit, Marie B.		00191	00001	C.3.1.2	--	--	--

C.9-198

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Virginia (continued)								
	Ries, Ken P.		00081	00001	C.3.4.4	--	--	--
	Robertson, John B.	Off. of Hazardous Waste Hydro.	01738	00001	C.2.8.2	--	--	--
	Sandy, Lawrence P.		01555	00002	C.3.1.2	--	--	--
	Sprague, Elizabeth F.		00622	00004	C.3.1.2	--	--	--
Washington								
	Allyn, Robert C.		00171	00001	C.3.4.4	--	--	--
	Amundson, Dr. Bruce		02536	00003	C.3.1.2	--	--	--
	Amundson, Dr. Bruce	E.Wash Chapt, Phys. Social Respon.	01535	00006	C.3.4.2.1	--	--	--
	Anderson, James		01357	00003	C.2.7	--	--	--
			01357	00005	C.2.6.1	--	--	--
			01357	00007	C.2.4.1	--	--	--
			01357	00008	C.3.4.4	--	--	--
			01357	00009	C.3.1.1	--	--	--
			01357	00010	C.2.1.1	--	--	--
			01357	00011	C.2.3.1	--	--	--
	Anderson, Dr. Tony		02529	00002	C.2.4.1	--	--	--
			02529	00003	C.2.4.1	--	--	--
	Anderson, Richard L.		02538	00001	C.2.4.1	--	--	--
			02538	00002	C.2.3.1	--	--	--
	Andrews, Scott		02103	00002	C.3.4.4	--	--	--
			02103	00003	C.2.4.1	--	--	--
	Anonymous		01098	00001	C.3.4.4	--	--	--
	Anonymous		01153	00001	C.2.8.1	--	--	--
			02410	00001	C.2.4.1	--	--	--
			02410	00002	C.2.6	--	--	--
			02410	00003	C.2.4.1	--	--	--
	Anonymous		02425	00003	C.2.2.3	--	--	--
			02425	00009	C.3.4	--	--	--
	Anonymous		02428	00003	C.2.1.2	--	--	--
			02428	00004	C.2.4.1	--	--	--
		Petition	02588	00001	C.3.4.4	--	--	--
		Tri-City Nuclear Industrial Cncl.	02300	00001	C.2.1.1	--	--	--
			02300	00002	C.2.1	--	--	--
			02300	00003	C.2.1.1	--	--	--
		WASHPIRG	02630	00001A	C.3.1.1	--	--	--
			02630	00001B	C.3.4.4	--	--	--

C.9-199

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
			02630	00001C	C.3.1.1	--	--	--
			02630	00002	C.2.2	--	--	--
			02630	00003	C.2.4.1	--	--	--
			02630	00004	C.3.1.2	--	--	--
			02630	00005	C.2.6.1	--	--	--
			02630	00006	C.2.1.1	--	--	--
		Nuclear Waste Board	02682	00001	C.3.4.4	--	--	--
			02682	00002A	C.3.4.4	--	--	--
			02682	00002D	C.3.1.2	--	--	--
			02682	00003	C.2.5.2	--	--	--
			02682	00004	C.3.4.4	--	--	--
			02682	00005	C.3.1.2	--	--	--
			02682	00007	C.2.4.1	--	--	--
			02682	00010	C.3.4.1	--	--	--
			02682	00011	C.3.1.2	--	--	--
			02682	00012	C.2.8.2	--	--	--
			02682	00013	C.2.5.2	--	--	--
			02682	00014	C.3.1.2	--	--	--
			02682	00015	C.3.1.2	--	--	--
			02682	00016	C.3.4.2.2	--	--	--
			02682	00017	C.2.4.2	--	--	--
			02682	00018	C.3.1.2	--	--	--
			02682	00022	C.3.1.1	--	--	--
			02682	00023	C.2.1.1	--	--	--
			02682	00024	C.3.4.4	--	--	--
			02682	00027	C.2.3.1	--	--	--
			02682	00029	C.2.4.1	--	--	--
			02682	00031	C.2.3.1	--	--	--
			02682	00032	C.3.4.4	--	--	--
			02682	00036	C.2.6.1	--	--	--
			02682	00037	C.3.4.4	--	--	--
			02682	00038A	C.3.1.2	C.5.1	--	--
			02682	00041	C.2.3.1	--	--	--
			02682	00042	C.2.3.1	--	--	--
			02682	00049	C.3.4.3	--	--	--
			02682	00050	C.3.4.1	--	--	--
			02682	00051	C.2.3.1	--	--	--
			02682	00052	C.3.1.2	--	--	--

C.9-200

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
			02682	00053	C.3.4.3	--	--	--
			02682	00054	C.3.1.2	--	--	--
			02682	00055	C.2.3.1	C.5.11	--	--
			02682	00064	C.3.4.4	--	--	--
			02682	00066	C.2.7	--	--	--
			02682	00068	C.2.4.2	--	--	--
			02682	00069	C.3.4.4	--	--	--
			02682	00070	C.2.4.3	--	--	--
			02682	00071	C.3.4.3	--	--	--
			02682	00072	C.3.1.2	--	--	--
			02682	00073	C.3.4.3	--	--	--
			02682	00078	C.2.1.1	--	--	--
			02682	00079	C.3.1.2	--	--	--
			02682	00080	C.3.1.2	--	--	--
			02682	00081	C.2.4.3	--	--	--
			02682	00085	C.3.1.1	--	--	--
			02682	00092	C.2.6	--	--	--
			02682	00097	C.3.1.1	--	--	--
			02682	00098	C.2.3.2	--	--	--
			02682	00099	C.2.2.1	--	--	--
			02682	00100	C.2.1.1	--	--	--
			02682	00101	C.3.1.2	--	--	--
			02682	00104	C.2.7	--	--	--
			02682	00105	C.2.7	--	--	--
			02682	00106	C.3.1.2	--	--	--
			02682	00107	C.2.8.2	--	--	--
	Ardaiz, Martha C.		00239	00001	C.3.4.4	--	--	--
	Ardaiz, Martha C.		00341	00001	C.3.1.2	--	--	--
	Arter, Dennis R.	TICOMP	01506	00001	C.3.1.1	--	--	--
			01506	00002	C.2.7.1	--	--	--
	Ashburn, Dan		02323	00001	C.2.8	--	--	--
	Ashburn, Daniel J.		02625	00001	C.2.8.3	--	--	--
	Bailey, Lyle C.		01299	00001	C.3.4.4	--	--	--
	Baillie, Toni K.		01509	00001	C.3.4.4	--	--	--
	Baker, Kris		00298	00001	C.3.4.4	--	--	--
	Baker, George		00502	00001	C.2.8.2	--	--	--
			00502	00002	C.3.4.4	--	--	--
			00502	00003	C.2.5.2	--	--	--

C.9-201

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Baker, Roger		00502	00004	C.2.8.1	--	--	--
			01104	00001	C.3.4.4	--	--	--
			01104	00002	C.3.4.4	--	--	--
			01104	00003	C.2.3.1	--	--	--
			01104	00005	C.3.4.4	--	--	--
	Barner, George		02326	00006	C.3.1.1	--	--	--
			02326	00007	C.3.4	--	--	--
			02326	00008	C.3.4	--	--	--
	Barnes, Ronald		02402	00001	C.2.3.3	--	--	--
			02402	00002	C.2.3.1	--	--	--
	Barnes, Ronald	Save The Resources Committee	01504	00001	C.3.1.2	--	--	--
			01504	00002	C.3.1.2	--	--	--
			01504	00004	C.3.1.2	--	--	--
			01504	00005	C.2.2	--	--	--
			01504	00006	C.2.2.1	--	--	--
			01504	00008	C.3.4.4	--	--	--
	Bartlett, Donald H.		00219	00001	C.7.3	--	--	--
			00219	00003	C.3.4.2	--	--	--
	Bartlett, John		02431	00002	C.3.4.4	--	--	--
	Bass, Don		02436	00001	C.3.4.4	--	--	--
	Bauermeister, Jim		02319	00001	C.3.1.2	--	--	--
	Bauermeister, Jim		02623	00001	C.3.1.2	--	--	--
			02623	00006	C.2.4.1	--	--	--
			02623	00008	C.3.4.4	--	--	--
	Beadle, Deborah		00208	00001	C.7.3	--	--	--
			00208	00003	C.3.4.4	--	--	--
			00208	00005	C.2.3.2	--	--	--
			00208	00006	C.3.4.4	--	--	--
	Beadle, Deborah		02265	00001	C.2.4.1	--	--	--
			02265	00002	C.2.4.1	--	--	--
	Beadle, Deborah		02302	00001	C.2.4.1	--	--	--
			02302	00002	C.2.4.1	--	--	--
	Beare, Dr. John A.	Social & Health Services	01518	00001	C.2.3.1	--	--	--
			01518	00003	C.2.3.1	--	--	--
			01518	00006	C.2.8.3	--	--	--
			01518	00010	C.2.8.3	--	--	--
			01518	00014	C.2.4.1	--	--	--
			01518	00016	C.2.4.1	--	--	--

C.9-202

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Beckham, Ruth H.		01518	00017	C.3.4.3	C.2.7	--	--
	Beglin, Janice A.		00419	00001	C.3.4.4	--	--	--
			01588	00001	C.2.6	--	--	--
			01588	00002	C.3.4.4	--	--	--
			01588	00003	C.3.1.2	--	--	--
			01588	00004	C.2.1.1	--	--	--
	Beglin, H. E.		01589	00001	C.2.6	--	--	--
			01589	00002B	C.3.1.2	--	--	--
			01589	00003	C.3.1.2	--	--	--
			01589	00004	C.2.1.1	--	--	--
	Benson, William	SW Washington Health District	01234	00002	C.3.1.2	--	--	--
			01234	00003	C.3.1.2	--	--	--
	Berg, Mrs. Norma		00111	00001	C.3.4.4	--	--	--
			00111	00003	C.3.4.4	--	--	--
	Bishop, Warren A.		02311	00001	C.2.1.2	--	--	--
			02311	00002	C.3.4.3	--	--	--
			02311	00003	C.3.1.2	--	--	--
			02311	00004	C.2.7.1	--	--	--
			02311	00005	C.2.7.1	--	--	--
			02311	00006	C.2.2	--	--	--
			02311	00007	C.2.6.1	--	--	--
			02311	00009	C.5.11	C.5.3	--	--
			02311	00013	C.2.5.1	--	--	--
			02311	00014	C.2.4.1	--	--	--
			02311	00015	C.2.4.1	--	--	--
	Bishop, Warren A.	Nuclear Waste Board	02667	00001	C.3.4.4	--	--	--
			02667	00002	C.2.4	--	--	--
	Bishop, Warren A.	Nuclear Waste Board	02680	00001	C.3.4.3	--	--	--
			02680	00002	C.3.1.2	--	--	--
			02680	00003	C.3.4.3	--	--	--
			02680	00004	C.2.2	--	--	--
			02680	00005	C.2.7.1	--	--	--
			02680	00006	C.2.2	--	--	--
			02680	00007	C.3.1.2	--	--	--
			02680	00009	C.2.4.1	--	--	--
			02680	00010	C.2.4.1	--	--	--
			02680	00011	C.3.4.3	--	--	--
			02680	00012	C.2.4.1	--	--	--

C.9-203

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
			02680	00013	C.2.4.1	--	--	--
			02680	00014	C.2.4.1	--	--	--
			02680	00015	C.2.5.1	--	--	--
			02680	00016	C.2.4.1	--	--	--
			02680	00017	C.2.4.1	--	--	--
			02680	00018	C.2.4.1	--	--	--
			02680	00019	C.2.4.1	--	--	--
			02680	00021	C.2.4.1	--	--	--
			02680	00022	C.2.6.1	--	--	--
			02680	00025	C.2.6.1	--	--	--
	Bishop, Warren	WA Nuclear Waste Board	01496	00001	C.2.7.1	--	--	--
			01496	00002	C.2.3.3	--	--	--
			01496	00006	C.2.5.1	--	--	--
	Bishop, Warren A.		02707	00001	C.2.5.1	--	--	--
			02707	00002	C.2.8.2	--	--	--
			02707	00003	C.3.1.2	--	--	--
			02707	00004	C.3.1.1	--	--	--
			02707	00005	C.3.1.2	--	--	--
			02707	00013	C.2.4.1	--	--	--
			02707	00014	C.2.4.1	--	--	--
			02707	00015	C.2.4.1	--	--	--
			02707	00016	C.2.4.1	--	--	--
			02707	00017	C.2.4.1	--	--	--
			02707	00018	C.2.4.1	--	--	--
			02707	00019	C.2.4.1	--	--	--
			02707	00020	C.2.4.1	--	--	--
			02707	00021	C.2.4.1	--	--	--
			02707	00022	C.2.4.1	--	--	--
			02707	00023	C.2.4.1	--	--	--
			02707	00025	C.2.4.1	--	--	--
			02707	00026	C.2.4.1	C.7.3	--	--
	Bishop, Warren A.		01511	00001	C.3.4.3	--	--	--
			01511	00002	C.3.4.3	--	--	--
			01511	00003	C.3.4.3	--	--	--
			01511	00004	C.3.4.3	--	--	--
			01511	00005	C.3.4.3	--	--	--
			01511	00006	C.3.4.3	--	--	--
			01511	00007	C.3.4.3	--	--	--

C.9-204

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
			01511	00008	C.3.4.3	--	--	--
			01511	00009	C.3.4.3	--	--	--
			01511	00010	C.3.4.3	--	--	--
			01511	00011	C.3.4.3	--	--	--
			01511	00012	C.3.4.3	--	--	--
			01511	00013	C.3.4.3	--	--	--
			01511	00014	C.3.4.3	--	--	--
			01511	00015	C.3.4.4	--	--	--
			01511	00016	C.3.4.3	--	--	--
			01511	00017	C.3.4.4	--	--	--
			01497	00002	C.2.1.1	--	--	--
			01497	00003	C.2.1.2	--	--	--
			01497	00005	C.3.1.2	--	--	--
			01497	00006	C.3.1.2	--	--	--
			01497	00007	C.2.6.1	--	--	--
			01497	00008	C.2.8.2	--	--	--
			01497	00009	C.2.5.2	--	--	--
			01497	00011	C.3.4	--	--	--
			01497	00012	C.3.4.4	--	--	--
			01497	00017	C.3.4.3	--	--	--
			01497	00019	C.2.4.3	--	--	--
			01497	00023	C.3.1.2	--	--	--
			01497	00025	C.2.1.3	--	--	--
			01497	00026	C.3.4.4	--	--	--
			01497	00027	C.3.4.4	--	--	--
			01497	00028	C.2.3.1	--	--	--
			01497	00029	C.2.1.1	--	--	--
			01497	00030	C.3.1.2	--	--	--
			01497	00032	C.3.4.4	--	--	--
			01497	00034	C.3.4.4	--	--	--
			01497	00036	C.2.2.1	--	--	--
			01497	00041	C.2.8.3	--	--	--
			01497	00042	C.2.2.1	--	--	--
			01497	00044	C.2.6.2	--	--	--
			01497	00045	C.2.8.2	--	--	--
			01497	00046	C.2.8.2	--	--	--
			01497	00047	C.2.8.2	--	--	--
			01497	00048	C.2.1.1	--	--	--

Bishop, Warren A.

C.9-205

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington</u> (continued)								
			01497	00049	C.3.4.4	--	--	--
			01497	00051	C.3.1.2	--	--	--
			01497	00052	C.3.1.2	--	--	--
			01497	00053	C.2.3.2	--	--	--
			01497	00054	C.7.3	--	--	--
			01497	00055	C.2.2.1	--	--	--
			01497	00056	C.2.2.1	--	--	--
			01497	00057	C.3.1.2	--	--	--
			01497	00058	C.3.1.2	--	--	--
			01497	00059	C.2.3.1	--	--	--
			01497	00060	C.2.3.1	--	--	--
			01497	00061	C.2.4.1	--	--	--
			01497	00063	C.2.4.1	--	--	--
			01497	00066	C.2.8.1	--	--	--
			01497	00067	C.2.6.2	--	--	--
			01497	00068	C.2.3.1	--	--	--
			01497	00069	C.2.3.1	--	--	--
			01497	00070	C.2.5.1	--	--	--
			01497	00071	C.2.1.1	--	--	--
			01497	00072	C.2.1.2	--	--	--
			01497	00073	C.3.4.4	--	--	--
			01497	00075	C.2.6	--	--	--
			01497	00076	C.2.1	--	--	--
			01497	00077	C.3.1.2	--	--	--
			01497	00078	C.2.1.2	--	--	--
			01497	00079	C.3.1.2	--	--	--
			01497	00081	C.3.1.2	--	--	--
			01497	00082	C.2.3.2	--	--	--
			01497	00083	C.2.8.2	--	--	--
			01497	00085	C.2.8.1	--	--	--
			01497	00086	C.2.8.3	--	--	--
			01497	00087	C.2.3.1	--	--	--
			01497	00088	C.2.8.2	--	--	--
			01497	00089	C.2.1.2	--	--	--
			01497	00090	C.2.5.1	--	--	--
			01497	00091	C.3.4.4	--	--	--
			01497	00092	C.2.1.2	--	--	--
			01497	00093	C.2.1.1	--	--	--

C.9-206

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
			01497	00098	C.2.4.1	--	--	--
			01497	00103	C.2.2	--	--	--
			01497	00112	C.3.1.2	--	--	--
			01497	00113	C.2.8.3	--	--	--
			01497	00114	C.2.8.2	--	--	--
			01497	00115	C.2.8.2	--	--	--
			01497	00116	C.3.1.2	--	--	--
			01497	00117	C.3.4.4	--	--	--
			01497	00118	C.3.1.2	--	--	--
			01497	00119	C.3.1.2	--	--	--
			01497	00120	C.3.1.2	--	--	--
			01497	00121	C.3.1.2	--	--	--
			01497	00122	C.3.1.2	--	--	--
			01497	00123	C.3.1.2	--	--	--
			01497	00124	C.2.1.3	--	--	--
			01497	00125	C.3.1.2	--	--	--
			01497	00126	C.3.4.3	--	--	--
			01497	00127	C.3.1.2	--	--	--
			01497	00128	C.3.1.2	--	--	--
			01497	00129	C.2.1.2	--	--	--
			01497	00130	C.2.8.3	--	--	--
			01497	00131	C.2.7	--	--	--
			01497	00132	C.2.1.1	--	--	--
			01497	00140	C.2.2	--	--	--
			01497	00146	C.2.8.3	--	--	--
			01497	00147	C.2.5.2	--	--	--
			01497	00148	C.2.2	--	--	--
			01497	00152	C.2.3.1	--	--	--
			01497	00156	C.3.1.2	--	--	--
			01497	00159	C.2.1.1	--	--	--
			01497	00161A	C.2.3.2	--	--	--
			01497	00161B	C.2.1.2	--	--	--
			01497	00162	C.3.1.2	--	--	--
			01497	00167	C.2.4.1	--	--	--
			01497	00174	C.3.1.2	--	--	--
			01497	00175	C.3.1.2	--	--	--
			01497	00176	C.2.3.3	--	--	--
			01497	00177	C.3.4.3	--	--	--

C.9-207

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington</u> (continued)								
			01497	00178	C.2.5.2	--	--	--
			01497	00179	C.2.5.1	--	--	--
			01497	00180	C.2.5	--	--	--
			01497	00181	C.3.1.2	--	--	--
			01497	00182	C.2.1.1	--	--	--
			01497	00183	C.2.1.2	--	--	--
			01497	00194	C.2.5.2	--	--	--
			01497	00195	C.2.5.2	--	--	--
			01497	00197	C.2.6	--	--	--
			01497	00199	C.2.6.1	--	--	--
			01497	00200	C.2.8.2	--	--	--
			01497	00201	C.2.1.2	--	--	--
			01497	00202	C.3.4.4	--	--	--
			01497	00203	C.2.5.1	--	--	--
			01497	00204	C.2.4.1	--	--	--
			01497	00205	C.2.8.3	--	--	--
			01497	00206	C.3.4.4	--	--	--
			01497	00207A	C.2.3.2	--	--	--
			01497	00207B	C.2.5.2	--	--	--
			01497	00207C	C.2.1.2	--	--	--
			01497	00207D	C.2.1.2	--	--	--
			01497	00210	C.2.6.3	--	--	--
			01497	00211A	C.2.8.1	--	--	--
			01497	00211B	C.2.4.1	--	--	--
			01497	00212	C.3.1.2	--	--	--
			01497	00213	C.2.3.3	--	--	--
			01497	00214	C.3.4.3	--	--	--
			01497	00215A	C.2.6.2	--	--	--
			01497	00216	C.3.1.2	--	--	--
			01497	00217	C.3.4.4	--	--	--
			01497	00218	C.2.3.3	--	--	--
			01497	00219	C.2.4.1	--	--	--
			01497	00220	C.3.4.4	--	--	--
			01497	00221	C.2.1.1	--	--	--
			01497	00223	C.2.3.1	--	--	--
			01497	00226	C.2.4.1	--	--	--
			01497	00227	C.2.4.1	--	--	--
			01497	00228	C.2.4.1	--	--	--

C.9-208

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
			01497	00229	C.2.4.1	--	--	--
			01497	00245	C.3.1.2	--	--	--
			01497	00246	C.3.1.2	--	--	--
			01497	00247	C.3.1.2	--	--	--
			01497	00248	C.3.1.2	--	--	--
			01497	00249	C.3.1.2	--	--	--
			01497	00250	C.2.3.1	--	--	--
			01497	00251	C.2.1.1	--	--	--
			01497	00252	C.2.1.1	--	--	--
			01497	00253	C.2.1.1	--	--	--
			01497	00266	C.2.4.1	--	--	--
			01497	00268	C.2.4.1	--	--	--
			01497	00271	C.2.4.1	--	--	--
			01497	00274	C.2.8.3	--	--	--
			01497	00276	C.2.8.3	--	--	--
			01497	00278	C.2.3.1	--	--	--
			01497	00279	C.2.3.1	--	--	--
			01497	00280	C.2.8.3	--	--	--
			01497	00281	C.2.8.3	--	--	--
			01497	00282	C.2.1.5	C.2.3.1	--	--
			01497	00283	C.2.6.1	--	--	--
			01497	00284	C.2.4.1	--	--	--
			01497	00285	C.2.1.1	--	--	--
			01497	00286	C.2.3.1	--	--	--
			01497	00287	C.2.5.2	--	--	--
			01497	00289	C.2.1.2	--	--	--
			01497	00292	C.2.8.2	--	--	--
			01497	00293	C.3.4.4	--	--	--
			01497	00294	C.2.4.2	--	--	--
			01497	00295	C.3.4.4	--	--	--
			01497	00296	C.2.3.2	--	--	--
			01497	00297	C.2.8.1	--	--	--
			01497	00299	C.2.4.1	--	--	--
			01497	00300	C.3.1.2	--	--	--
			01497	00302	C.3.4.4	--	--	--
			01497	00303A	C.3.1.2	--	--	--
			01497	00303B	C.2.3.1	--	--	--
			01497	00304	C.2.5.1	--	--	--

C.9-209

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
			01497	00305	C.2.8.1	--	--	--
			01497	00306	C.2.8.2	--	--	--
			01497	00307	C.3.4.4	--	--	--
			01497	00308	C.3.4.4	--	--	--
			01497	00309	C.3.1.2	--	--	--
			01497	00310	C.3.1.2	--	--	--
			01497	00311	C.3.1.2	--	--	--
			01497	00312	C.2.3.2	--	--	--
			01497	00313	C.2.8.3	--	--	--
			01497	00314	C.2.4.1	--	--	--
			01497	00315	C.2.3.1	--	--	--
			01497	00316	C.3.1.2	--	--	--
			01497	00317A	C.2.6.2	--	--	--
			01497	00317B	C.2.6.2	--	--	--
			01497	00318	C.2.8.3	--	--	--
			01497	00319	C.3.1.2	--	--	--
			01497	00320	C.2.4.1	--	--	--
			01497	00321	C.2.4.1	--	--	--
			01497	00322A	C.2.4.1	--	--	--
			01497	00326	C.2.4.1	--	--	--
			01497	00343	C.3.1.2	--	--	--
			01497	00344	C.3.1.2	--	--	--
			01497	00345	C.3.1.2	--	--	--
			01497	00346A	C.3.4.4	--	--	--
			01497	00346B	C.3.1.2	--	--	--
			01497	00347	C.3.4.3	--	--	--
			01497	00348	C.3.1.2	--	--	--
			01497	00349	C.2.3.3	--	--	--
			01497	00350	C.2.6.2	--	--	--
			01497	00351	C.2.1.1	--	--	--
			01497	00362	C.2.3.2	--	--	--
			01497	00366	C.2.8.3	--	--	--
			01497	00367	C.2.1.2	--	--	--
			01497	00369	C.2.2	--	--	--
			01497	00375	C.2.3.1	--	--	--
			01497	00377	C.2.6.1	--	--	--
			01497	00378	C.2.4.1	--	--	--
			01497	00379	C.2.6.1	--	--	--

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Bissonnette, Joe		02281	00001	C.3.4.4	--	--	--
	Black, Gloria		01082	00001	C.2.8.3	--	--	--
			01082	00002	C.3.4.4	--	--	--
	Blackford, Irene		00670	00001	C.3.4.4	--	--	--
	Blum, Dr. Peter		02406	00001	C.2.8.1	--	--	--
	Bogges, Alva A.		00105	00001	C.3.4.4	--	--	--
	Bogle, Julie		02552	00001	C.3.1.2	C.7.4	--	--
			02552	00003	C.2.3.3	--	--	--
			02552	00004	C.2.4.1	--	--	--
			02552	00005	C.3.1.2	--	--	--
	Boldman, Susan		02568	00001	C.3.1.2	--	--	--
			02568	00002	C.2.8.2	--	--	--
	Bonifer, Lorrie		01590	00001	C.2.6	--	--	--
			01590	00002B	C.3.1.2	--	--	--
			01590	00003	C.3.1.2	--	--	--
			01590	00004	C.2.1.1	--	--	--
	Booth, Patsy A.		01116	00001	C.3.1.2	C.5.11	--	--
			01116	00003	C.2.3.1	--	--	--
			01116	00004	C.2.4.1	--	--	--
			01116	00005	C.3.4.4	--	--	--
	Bosch, W. Bruce	Clark County PUD	01595	00001	C.3.4.4	--	--	--
	Braudenberg, M.		01207	00001	C.3.4.4	--	--	--
	Breithaupt, Steve		02539	00001	C.2.1.3	--	--	--
			02539	00002	C.3.1.2	--	--	--
			02539	00003	C.2.3.1	--	--	--
			02539	00006	C.2.4.1	--	--	--
			02539	00007	C.2.4.1	--	--	--
			02539	00008	C.2.4.1	--	--	--
			02539	00009	C.2.4.1	--	--	--
			02539	00010	C.2.4.1	--	--	--
			02539	00011	C.2.4.1	--	--	--
			02539	00012	C.2.1.1	--	--	--
	Bringloe, Anne		02334	00001	C.3.1.1	--	--	--
			02334	00002	C.3.1.2	--	--	--
			02334	00003	C.3.1.2	--	--	--
			02334	00004	C.3.1.1	--	--	--
			02334	00005	C.2.4.1	--	--	--
			02334	00006	C.3.1.2	--	--	--

C.9-211

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION				
					FIRST	SECOND	THIRD	FOURTH	
<u>Washington</u> (continued)									
			02334	00007	C.2.3.1	--	--	--	--
			02334	00008	C.2.1.1	--	--	--	--
			02334	00009	C.2.2.1	--	--	--	--
	Bringloe, Anne H.	The Sierra Club	02334	00010	C.2.1.1	--	--	--	--
			02365	00001	C.3.1.1	--	--	--	--
			02365	00002	C.3.1.2	--	--	--	--
			02365	00003	C.3.1.2	--	--	--	--
			02365	00004	C.3.1.1	--	--	--	--
			02365	00005	C.2.4.1	--	--	--	--
			02365	00006	C.3.1.2	--	--	--	--
			02365	00007	C.2.3.1	--	--	--	--
			02365	00008	C.2.1.1	--	--	--	--
			02365	00009	C.2.1.2	--	--	--	--
			02365	00010	C.2.1.1	--	--	--	--
	Brody, Kathy		01226	00001	C.3.1.2	--	--	--	--
			01226	00002	C.2.8.2	--	--	--	--
	Broschious, Charles		02569	00001	C.2.1.1	--	--	--	--
	Brown, Mr. & Mrs. A. N.		00295	00001	C.2.1.1	--	--	--	--
			00295	00003	C.3.4.4	--	--	--	--
	Brown, Barbara		01079	00001	C.2.5.2	--	--	--	--
			01079	00002	C.3.1.2	--	--	--	--
	Brown, Chris	Grays Harbor Democ. Central Com.	01502	00001	C.3.4.4	--	--	--	--
			01502	00002	C.3.1.2	--	--	--	--
	Brucato, Albert		00372	00002	C.2.8.2	--	--	--	--
	Brucato, Ingrid		00373	00002	C.2.8.2	--	--	--	--
	Budd, William W.		01521	00002	C.2.4.1	--	--	--	--
			01521	00004	C.2.4.1	--	--	--	--
	Buehler, Nettie B.		00496	00002	C.2.4.2	--	--	--	--
	Buller, Eileen		02317	00001	C.3.1.2	--	--	--	--
			02317	00002	C.3.1.2	--	--	--	--
	Buller, Patrick		02378	00001	C.2.8.2	--	--	--	--
	Buller, R. Eileen	Hanford Oversight Committee	02627	00001	C.3.1.2	--	--	--	--
			02627	00002	C.3.1.2	--	--	--	--
	Bullington, Darryl		00265	00001	C.2.1.1	--	--	--	--
			00265	00002A	C.2.4.1	--	--	--	--
			00265	00002B	C.2.5.7	--	--	--	--

C.9-212

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
			00265	00002C	C.2.4.1	--	--	--
			00265	00003	C.2.8.3	--	--	--
			00265	00004	C.2.8.3	--	--	--
			00265	00007	C.2.3.2	--	--	--
			00265	00011	C.2.6.1	--	--	--
			00265	00013	C.2.3.2	--	--	--
			00265	00014	C.2.8.2	--	--	--
			00265	00015	C.3.1.2	--	--	--
	Bullock, David	The Society of the Holy Earth	02374	00001	C.3.4.4	--	--	--
	Burnet, Patricia		01111	00001	C.3.1.2	--	--	--
			01111	00002A	C.3.4.4	--	--	--
			01111	00002B	C.3.1.2	--	--	--
			01111	00002C	C.2.3.3	--	--	--
			01111	00002D	C.3.1.2	--	--	--
			01111	00003	C.3.1.2	--	--	--
			01111	00004	C.3.1.2	--	--	--
			01111	00005A	C.3.2	--	--	--
			01111	00005B	C.2.1.2	--	--	--
			01111	00006	C.2.8.1	--	--	--
	Burnum, Steven		01113	00001	C.3.4.4	--	--	--
	Burt, Peggy		02535	00001	C.2.4.1	--	--	--
	Bush, Shirley J.		00230	00001	C.3.1.2	--	--	--
	Buske, Norman	Search Technical Services	00507	00001	C.3.2	C.5.11	--	--
	Caldwell, Larry		01247	00001	C.2.1.1	--	--	--
			01247	00002	C.3.1.2	--	--	--
			01247	00004	C.2.3.1	--	--	--
			01247	00006	C.2.3.1	C.9	--	--
			01247	00008	C.2.7	C.3.1.2	--	--
			01247	00011	C.2.4.1	--	--	--
			01247	00011A	C.2.4.1	--	--	--
			01247	00011B	C.7.3	C.2.4.1	--	--
			01247	00011C	C.7.3	C.2.4.1	--	--
			01247	00013	C.2.6.1	--	--	--
			01247	00014	C.2.3	--	--	--
			01247	00018	C.4.2.2	C.2.8.3	--	--
	Campbell, Michael		02555	00003	C.3.4.4	--	--	--
			02555	00004	C.2.4.1	--	--	--
			02555	00005	C.2.4.1	--	--	--

C.9-213

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
			02555	00006	C.2.4.1	--	--	--
			02555	00007	C.2.4.1	--	--	--
	Carson, R. J.		00497	00001	C.2.1.2	--	--	--
	Carter, Dorothy E.		00646	00001	C.3.4.4	--	--	--
			00646	00002	C.2.8.3	--	--	--
			00646	00003	C.2.8.1	--	--	--
	Cartmell, John		02273	00002	C.2.8.2	--	--	--
	Cartmell, John		01508	00002	C.2.8.2	--	--	--
	Cassuto, Sherrri		02385	00002	C.2.1.1	--	--	--
	Chapin, Mildred C.		00394	00004A	C.3.1.2	--	--	--
	Cheney, Elinor V.		00383	00001	C.2.8.1	--	--	--
	Cheng, Peter		02400	00013	C.2.7	--	--	--
			02400	00015	C.2.3.1	--	--	--
			02400	00017	C.2.3.1	--	--	--
			02400	00018	C.3.1.2	--	--	--
			02400	00019	C.3.1.2	--	--	--
	Chicha, George S.		02521	00001	C.3.1.2	--	--	--
	Chicha, George S.		02585	00001	C.3.1.2	--	--	--
	Christensen, Liz		02549	00001	C.3.1.2	--	--	--
			02549	00002	C.2.3.1	--	--	--
			02549	00004	C.2.3.2	--	--	--
			02549	00005	C.2.4.1	--	--	--
			02549	00006	C.2.4.1	--	--	--
			02549	00007	C.2.4.1	--	--	--
			02549	00008	C.2.1.2	--	--	--
			02549	00008A	C.2.1	--	--	--
			02549	00008B	C.3.4.4	--	--	--
	Christensen, Liz	Action League, Hanford Education	02599	00001	C.2.3.3	--	--	--
			02599	00002	C.2.3.1	--	--	--
			02599	00003	C.2.4.1	--	--	--
	Christofferson, J.R.		00659	00001	C.3.4.4	--	--	--
			00659	00003	C.3.1.2	--	--	--
			00659	00005	C.2.8.2	--	--	--
			00659	00006	C.2.1.1	--	--	--
			00659	00007	C.2.1.1	--	--	--
	Clausen, Phyllis		01134	00001	C.2.1.1	--	--	--
			01134	00002	C.2.1.1	--	--	--
			01134	00003	C.3.1.2	--	--	--

C.9-214

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
			01134	00005B	C.2.3.3	--	--	--
			01134	00006	C.2.4.1	--	--	--
			01134	00008	C.2.1.1	--	--	--
			01134	00009	C.2.4.2	--	--	--
			01134	00010	C.2.1.2	--	--	--
	Clausen, Phyllis		02501	00001	C.2.3.3	--	--	--
			02501	00002	C.3.4.3	--	--	--
			02501	00003	C.3.1.2	--	--	--
			02501	00004	C.2.4.1	--	--	--
			02501	00006	C.2.4.1	--	--	--
			02501	00007	C.2.5.1	--	--	--
			02501	00008	C.2.1.2	--	--	--
	Cogle, S. J.		01538	00001	C.3.1.2	--	--	--
	Cole, Byron & Family		00643	00001	C.3.4.4	--	--	--
			00643	00003	C.3.1.2	--	--	--
			00643	00004	C.2.3.3	--	--	--
	Colony, Stephanie		01103	00001	C.3.4.4	--	--	--
		Nuclear Waste Board	01103	00002	C.2.8.2	--	--	--
			02681	00037	C.2.4.1	--	--	--
			02681	00039B	C.2.4.1	--	--	--
			02681	00039C	C.2.4.1	--	--	--
			02681	00039D	C.2.4.1	--	--	--
			02681	00039E	C.2.4.1	--	--	--
			02681	00039F	C.2.4.1	--	--	--
			02681	00039G	C.2.4.1	--	--	--
			02681	00039H	C.2.4.1	C.7.3	--	--
			02681	00040B	C.2.4.1	--	--	--
			02681	00044	C.2.4.1	--	--	--
			02681	00115	C.3.4	--	--	--
			02681	00116	C.3.4.3	--	--	--
			02681	00117	C.3.4.3	--	--	--
			02681	00118	C.3.4.3	--	--	--
			02681	00119	C.3.4.3	--	--	--
			02681	00120	C.3.4.3	--	--	--
	Connel, Bonnie		02295	00001	C.3.1.2	--	--	--
	Cordes, Deanne		01112	00001	C.3.1.2	--	--	--
			01112	00002	C.2.4.1	--	--	--
			01112	00003	C.2.8	--	--	--

C.9-215

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Corey, Barbara		02372	00001	C.3.4.4	--	--	--
	Corley-Wheeler, Nancy		01549	00001	C.3.4.4	--	--	--
	Corvin, Scott A.		00274	00002	C.3.4.4	--	--	--
	Cory, Barbara		02345	00001	C.3.4.4	--	--	--
	Cosby, Judith		01245	00001	C.2.3.1	--	--	--
			01245	00003	C.3.1.2	--	--	--
			01245	00004	C.2.8.1	--	--	--
			01245	00005A	C.3.4.4	--	--	--
			01245	00005B	C.2.4.1	--	--	--
			01245	00006	C.3.4.4	--	--	--
			01245	00007	C.3.4.4	--	--	--
			01245	00008	C.2.4.1	--	--	--
			01245	00009	C.3.4.4	--	--	--
			01245	00010	C.3.4.4	--	--	--
			01245	00015	C.2.8.1	--	--	--
			01245	00016	C.3.1.2	--	--	--
			01245	00019	C.2.4.1	--	--	--
			01245	00020	C.2.8.1	--	--	--
			01245	00021	C.3.4.4	--	--	--
			01245	00022	C.2.8.1	--	--	--
			01245	00023	C.2.8.1	--	--	--
			01245	00024A	C.2.6	--	--	--
			01245	00024C	C.3.1.2	--	--	--
	Courtright, Kelly D.		00617	00003A	C.3.2	--	--	--
			00617	00003B	C.2.3.2	--	--	--
			00617	00003C	C.2.3.2	--	--	--
	Covey, Pam		00186	00001A	C.3.1.2	--	--	--
			00186	00002	C.2.8.2	--	--	--
	Cowan, Thomas R.	B.O.C. San Juan County	02621	00001	C.2.1.1	--	--	--
			02621	00004	C.2.4.1	--	--	--
	Cowan, Thomas R.	Bd of Commissioners, San Juan Co.	02117	00001	C.2.1.1	--	--	--
	Cram, Bob and Martha		00453	00001	C.3.4.4	--	--	--
			00453	00002	C.2.8.2	--	--	--
	Cranage, Lillian		01594	00001	C.3.4.4	--	--	--
	Crane, David		01150	00001	C.3.1.2	--	--	--
			01150	00003	C.3.4.4	--	--	--
			01150	00004	C.2.1.2	--	--	--
	Crow, Rob		02321	00001	C.2.4.1	--	--	--

C.9-216

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington</u> (continued)								
			02321	00002	C.2.4.1	--	--	--
			02321	00003	C.2.4.1	C.8.2	C.5.3	--
			02321	00004	C.3.4.2.2	--	--	--
			02321	00005	C.2.4.1	--	--	--
			02321	00007	C.2.4.1	--	--	--
	Crowley, Carole		00431	00001	C.3.4.4	--	--	--
	Cummings, Coreen		02260	00001	C.3.1.2	--	--	--
			02260	00002	C.2.3.3	--	--	--
			02260	00005	C.2.2.2	--	--	--
	Cunningham, Kevin		02556	00001	C.2.4.1	--	--	--
			02556	00002	C.2.4.1	--	--	--
			02556	00003	C.2.4.1	--	--	--
	Cunningham, Kevin		02601	00001	C.2.4.1	--	--	--
			02601	00002	C.2.4.1	--	--	--
			02601	00003	C.2.4.1	--	--	--
	Dalton, Patrick		02527	00008	C.2.4.1	--	--	--
			02527	00009	C.2.4.1	--	--	--
			02527	00010	C.2.4.1	--	--	--
			02527	00011	C.2.4.1	--	--	--
			02527	00012	C.2.4.1	--	--	--
			02527	00013	C.2.4.1	--	--	--
			02527	00014	C.2.4.1	--	--	--
			02527	00015	C.2.4.1	--	--	--
			02527	00016	C.2.4.1	--	--	--
			02527	00017	C.2.4.1	--	--	--
			02527	00018	C.2.4.1	--	--	--
			02527	00019	C.2.4.1	--	--	--
			02527	00020	C.2.4.1	--	--	--
			02527	00021	C.2.4.1	--	--	--
			02527	00022	C.2.5.1	--	--	--
			02527	00023	C.3.4.3	--	--	--
	Dalton, Pat	City of Spokane	02590	00003	C.2.4.1	--	--	--
			02590	00004	C.2.4.1	--	--	--
			02590	00005	C.2.3.3	--	--	--
			02590	00006	C.2.8.2	--	--	--
			02590	00007	C.2.3.3	--	--	--
			02590	00008	C.3.4.3	--	--	--
			02590	00009	C.3.1.2	--	--	--

C.9-217

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
			02590	00016	C.2.4.1	--	--	--
			02590	00017	C.2.4.1	--	--	--
			02590	00018	C.2.4.1	--	--	--
			02590	00019	C.2.4.1	--	--	--
			02590	00020	C.2.4.1	--	--	--
			02590	00021	C.2.4.1	--	--	--
			02590	00022	C.2.4.1	--	--	--
			02590	00023	C.2.4.1	--	--	--
			02590	00024	C.2.4.1	--	--	--
			02590	00025	C.2.4.1	--	--	--
			02590	00026	C.2.4.1	--	--	--
	Darvill, Dr. F. T.		00322	00002	C.3.4.4	--	--	--
	Dautel, William A.		00494	00001	C.2.7	--	--	--
			00494	00004	C.2.8.2	--	--	--
			00494	00005	C.2.5.2	--	--	--
	Davis, Dorlyn		00673	00002	C.3.4.4	--	--	--
	Davis, James M.		02296	00001	C.3.4.4	--	--	--
	Davis, McClelland		02379	00003	C.2.3.1	--	--	--
	DeLaCruz, Joe B.	Quinault Indian Nation	01231	00001	C.2.7	--	--	--
			01231	00007	C.2.1.2	--	--	--
	DeSilva, Judith		02388	00002	C.3.1.2	--	--	--
	DeSilva, Peter		02394	00001	C.3.4.4	--	--	--
	Delaney, Helen		02523	00001	C.3.4.4	--	--	--
			02523	00002	C.2.3.1	--	--	--
			02523	00003	C.3.1.2	--	--	--
			02523	00004	C.3.4.2.2	--	--	--
			02523	00006	C.2.4.1	--	--	--
			02523	00009	C.3.1.2	--	--	--
	Delaney, Helen		02586	00001	C.3.4.4	--	--	--
			02586	00002	C.2.3.1	--	--	--
			02586	00003	C.3.4.4	--	--	--
			02586	00004	C.3.4.2.2	--	--	--
			02586	00006	C.2.4.1	--	--	--
			02586	00009	C.3.1.2	--	--	--
	Denkeigh, Mr. and Mrs. R.		00407	00001	C.3.1.2	--	--	--
	Dilger, Bob		02267	00001	C.2.4.1	--	--	--
			02267	00002	C.2.4.1	--	--	--
			02267	00003	C.2.4.1	--	--	--

C.9-218

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Dilger, Bob		02315	00001	C.2.4.1	--	--	--
			02315	00002	C.2.4.1	--	--	--
			02315	00003	C.2.4.1	--	--	--
			02315	00005	C.2.4.1	--	--	--
			02315	00006	C.2.4.1	--	--	--
			02315	00007	C.2.4.1	--	--	--
			02315	00008	C.2.1.2	--	--	--
	Dilger, Bob		02629	00002	C.2.4.1	--	--	--
			02629	00003	C.2.4.1	--	--	--
			02629	00005	C.2.4.1	--	--	--
			02629	00006	C.2.4.1	--	--	--
			02629	00007	C.2.4.1	--	--	--
			02629	00008	C.2.1.5	--	--	--
	Dodd, Celeste		02352	00001	C.3.1.2	--	--	--
	Donnally, Lisa		02348	00001	C.3.4.4	--	--	--
	Donovan, Mr. Virgil		02291	00002	C.2.5.2	--	--	--
	Douglas, Hector		02338	00001	C.3.4.4	--	--	--
			02338	00002	C.2.2	--	--	--
			02338	00004	C.2.1.1	--	--	--
			02338	00006	C.2.4.3	--	--	--
			02338	00007	C.2.3.1	--	--	--
			02338	00008	C.3.4.3	--	--	--
	Douglas, Hector		02368	00001	C.3.4.4	--	--	--
			02368	00002	C.2.2	--	--	--
			02368	00004	C.2.1.1	--	--	--
			02368	00006	C.2.4.3	--	--	--
			02368	00007	C.2.3.1	--	--	--
			02368	00008	C.3.4.3	--	--	--
	Downing, L. E.	Natl Assn. Retired Vets.	02571	00002	C.2.1.1	--	--	--
			02571	00003	C.2.4.1	--	--	--
			02571	00004	C.3.4.4	--	--	--
	Drakovich, Elizabeth		01587	00001	C.3.1.1	--	--	--
			01587	00009	C.2.3.1	--	--	--
	Draskovich, Libby		00466	00009	C.2.4.1	--	--	--
	Drew, Alice C.		00273	00002	C.3.4.4	--	--	--
	Eagle, WA State		00214	00001	C.3.4.4	--	--	--
	Eaton, Clark	Int'l Trollers Coalition	02087	00001	C.3.1.2	C.7.2	--	--
			02087	00002	C.3.1.2	C.7.2	--	--

C.9-219

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Ebert, L. C.		00240	00001	C.3.4.4	--	--	--
			00240	00002	C.2.8.1	--	--	--
			00240	00003	C.2.5.2	--	--	--
			00240	00004	C.3.4.4	--	--	--
	Ebert, L.C.		00663	00001	C.3.4.4	--	--	--
			00663	00002	C.2.8.1	--	--	--
			00663	00003	C.2.8.1	--	--	--
			00663	00004	C.2.5.2	--	--	--
			00663	00005	C.2.5.2	--	--	--
			00663	00006	C.2.3.3	--	--	--
			00663	00007	C.2.3.2	--	--	--
	Ebert, L.C.		01507	00001	C.2.5.2	--	--	--
			01507	00002	C.2.5.2	--	--	--
			01507	00003	C.3.4.4	--	--	--
	Edwards, Craig		00402	00001	C.3.4.4	--	--	--
			00402	00002	C.2.2	--	--	--
			00402	00006	C.7.3	--	--	--
	Edwards, Bobby		02386	00001	C.2.1.1	--	--	--
	Eisenman, Marilyn		00110	00001	C.3.4.4	--	--	--
	Eldridge, Les	Thurston County Commissioners	01501	00002	C.3.1.2	--	--	--
			01501	00003	C.3.1.2	C.5.8	--	--
			01501	00005	C.2.4.1	C.7.3	--	--
			01501	00006	C.3.1.2	--	--	--
	Eldridge, Les		02622	00002	C.3.1.2	C.4.4	--	--
			02622	00003	C.3.1.2	C.5.8	--	--
			02622	00005	C.2.4.1	C.7.3	--	--
			02622	00006	C.3.4.4	--	--	--
			02622	00007	C.3.4.4	--	--	--
			02622	00008	C.3.4.4	--	--	--
	Ellis, Dr. Frederick E.		02313	00001	C.2.1.1	--	--	--
			02313	00003	C.2.1.1	--	--	--
			02313	00004	C.2.8.2	--	--	--
			02313	00005	C.2.3.1	--	--	--
	Ellison, Mike		01306	00001	C.2.3.3	--	--	--
			01306	00002	C.2.3	--	--	--
			01306	00003	C.3.1.2	--	--	--
	Englehart, Cindy		02395	00003	C.2.6.1	--	--	--
	Fiddler, Mary		00158	00002	C.3.4.4	--	--	--

C.9-220

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Fields & Aylward, Mary & John	University of Washington	00158	00003	C.2.8.1	--	--	--
			01132	00001	C.3.1.2	--	--	--
			01132	00002	C.3.4.2.2	--	--	--
	Foley, Chuck		02384	00001	C.2.4.1	--	--	--
			02384	00002	C.2.4.1	--	--	--
			02384	00004	C.2.1.1	--	--	--
	Ford, Lillian		02418	00002	C.2.4.1	--	--	--
			02418	00003	C.3.4.4	--	--	--
			02418	00004	C.3.4.4	--	--	--
			02418	00005	C.3.4.4	--	--	--
			02418	00006	C.3.4.4	--	--	--
			02418	00008	C.3.4.4	--	--	--
	Ford, Lillian		02433	00003	C.2.4.1	--	--	--
	Foster, Dianne & Vincent		02084	00001	C.3.1.2	--	--	--
			02084	00002	C.3.1.2	--	--	--
			02084	00003	C.3.4.4	--	--	--
	Fowler, Hugh A.	WA State, Dept. Emergency Mgmt.	01519	00001	C.2.4.1	--	--	--
			01519	00005	C.2.4.1	--	--	--
	Foye, Coleen		00098	00002	C.3.1.2	--	--	--
			00098	00004	C.2.3.3	--	--	--
	Franz, Eldon H.	WSU, Environmental Science	01522	00001	C.3.4.3	--	--	--
	Frazier, C. Cheryl		01136	00001	C.3.4.4	--	--	--
	Fresk, Gary		02335	00001	C.2.7	--	--	--
			02335	00002	C.2.1.1	--	--	--
			02335	00003	C.2.1.1	--	--	--
			02335	00004	C.2.4.1	--	--	--
			02335	00005	C.2.1.1	--	--	--
	Fresk, Gary	Washington Waste Site Study Grp.	02366	00001	C.2.1.1	--	--	--
			02366	00002	C.2.1.1	--	--	--
			02366	00003	C.2.1.1	--	--	--
			02366	00004	C.2.4.1	--	--	--
			02366	00005	C.2.1.1	--	--	--
	Friedman, Al		02333	00002	C.3.3	--	--	--
			02333	00005	C.3.4.3	--	--	--
			02333	00006	C.3.1.2	--	--	--
			02333	00007	C.3.1.2	--	--	--
			02333	00008	C.3.1.2	--	--	--

C:9-221

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
			02333	00009	C.3.1.2	--	--	--
			02333	00010	C.3.4.4	--	--	--
	Friedman, Albert		02333	00011	C.3.4.4	--	--	--
			02364	00002	C.3.3	--	--	--
			02364	00006	C.3.3	--	--	--
			02364	00007	C.3.1.2	--	--	--
			02364	00008	C.3.1.2	--	--	--
			02364	00009	C.2.4.3	--	--	--
			02364	00010	C.3.1.2	--	--	--
			02364	00011	C.3.4.4	--	--	--
	Fry, Elaine		02531	00002	C.3.1.2	--	--	--
			02531	00003	C.3.1.2	--	--	--
			02531	00004	C.2.3.1	--	--	--
	Fuller, Mayor Walline	City of Stevenson	02080	00001	C.3.4.4	--	--	--
			02080	00003	C.2.4.1	--	--	--
			02080	00010	C.2.1.1	--	--	--
			02080	00011	C.2.6.1	--	--	--
			02080	00012	C.3.1.1	--	--	--
			02080	00013	C.3.4.3	--	--	--
			02080	00014	C.3.4.4	--	--	--
	Fyfe, Danne		00176	00001	C.3.1.2	--	--	--
			00176	00002	C.3.1.2	--	--	--
			00176	00005	C.3.1.2	--	--	--
			00176	00006	C.2.4.1	--	--	--
			00176	00007B	C.3.1.2	--	--	--
			00176	00008	C.2.8.3	--	--	--
	Garber, Loren		02336	00002	C.2.1.1	--	--	--
			02336	00012	C.2.2	--	--	--
			02336	00013	C.2.6	--	--	--
			02336	00015	C.3.1.2	--	--	--
			02336	00016	C.3.4.3	--	--	--
			02336	00017	C.2.4.3	--	--	--
			02336	00018	C.2.3.1	--	--	--
	Garber, Loren	WASHPIRG	02367	00002	C.2.1.1	--	--	--
			02367	00012	C.2.7	--	--	--
			02367	00015	C.3.1.2	--	--	--
			02367	00016	C.3.4.3	--	--	--
			02367	00017	C.2.4.3	--	--	--

C.9-222

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Gardner, Barbara A.		02367	00018	C.2.3.1	--	--	--
			01169	00001	C.3.4.4	--	--	--
			01169	00003	C.3.1.2	--	--	--
			01169	00004	C.2.3	--	--	--
			01169	00006	C.2.3.2	--	--	--
	Gardner, Barbara	Nuclear Waste Board	01495	00037	C.2.4.1	--	--	--
			01495	00044	C.2.4.1	--	--	--
			01495	00116	C.3.4.3	--	--	--
			01495	00117	C.3.4.3	--	--	--
			01495	00118	C.3.4.3	--	--	--
			01495	00119	C.3.4.3	--	--	--
			01495	00120	C.3.4.3	--	--	--
	Geary, John		01339	00004	C.3.4.4	--	--	--
			01339	00005	C.2.4.1	--	--	--
	Gibbons, Richard P.		00533	00002	C.2.8.2	--	--	--
			00533	00006	C.2.8.2	--	--	--
	Gibbs, Christine		01139	00001	C.3.1.2	C.5.7	--	--
	Giddings, Roxie		02351	00001	C.2.8.1	--	--	--
			02351	00002	C.2.5.1	--	--	--
	Gifford, Jr., Frank Q.		00210	00001	C.3.4.4	--	--	--
	Gilbert, Karen		02514	00001	C.2.4.1	--	--	--
			02514	00002	C.3.4.4	--	--	--
			02514	00003	C.3.1.2	--	--	--
			02514	00007	C.2.3.1	--	--	--
	Gilbert, Karen		02577	00001	C.2.4.1	--	--	--
			02577	00002	C.3.4.4	--	--	--
			02577	00003	C.3.1.2	--	--	--
			02577	00007	C.2.3.1	--	--	--
	Gill, Ty		00380	00001	C.3.4.4	--	--	--
			00380	00002	C.2.8.1	--	--	--
	Girvin, Dr. George		02560	00001	C.2.4.1	--	--	--
			02560	00002	C.2.4.1	--	--	--
	Gordon, Thomas		01148	00004	C.2.4.1	--	--	--
			01148	00005	C.2.1.2	--	--	--
			01148	00006	C.3.4.4	--	--	--
			01148	00010	C.2.3.1	--	--	--
			01148	00013	C.3.1.2	--	--	--
	Graf, David		02279	00015	C.2.7	--	--	--

C.9-223

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Graham, Phyllis		00309	00002	C.2.8.2	--	--	--
	Gray, Andrew		02404	00003	C.6.4	--	--	--
			02404	00004	C.3.3	--	--	--
	Grissom, Wilbur		00437	00002	C.2.8.2	--	--	--
	Grissom, Wilbur		01094	00002	C.2.8.2	--	--	--
	Grof, David		02305	00016	C.2.7	--	--	--
	Groves, David		02373	00001	C.3.4.4	--	--	--
			02373	00002	C.2.1.4	--	--	--
			02373	00003	C.2.8.1	--	--	--
			02373	00004	C.2.6.1	--	--	--
	Guilford, Rhonda	Petition	00131	00001	C.2.8.1	--	--	--
			00131	00003	C.2.6.3	--	--	--
	Haaga, Caroline		02409	00001	C.2.6.2	--	--	--
			02409	00002	C.2.1.1	--	--	--
	Hagen, Maurie		02543	00002	C.2.4.1	--	--	--
	Hagman, Shirley D.		00340	00001	C.3.4.4	--	--	--
			00340	00002	C.2.1.1	--	--	--
			00340	00003A	C.3.1.2	--	--	--
			00340	00003B	C.3.4.4	--	--	--
			00340	00003C	C.3.1.2	--	--	--
	Hale, Rick A.		00286	00001	C.2.4.1	--	--	--
			00286	00002	C.2.4.2	--	--	--
	Hampel, Laurel		00211	00001	C.3.4.4	--	--	--
	Hanners, Albert J.		00427	00001	C.3.4.1	--	--	--
			00427	00008	C.2.7	--	--	--
	Hanners, Al		02328	00001	C.3.4.3	--	--	--
			02328	00002	C.3.1.2	--	--	--
			02328	00003	C.2.3.1	--	--	--
			02328	00004	C.3.4.4	--	--	--
	Hanners, Albert J.		02624	00001	C.3.1.2	--	--	--
			02624	00002	C.3.1.2	--	--	--
			02624	00003	C.2.3.1	--	--	--
			02624	00004	C.3.1.2	--	--	--
	Hansen, Phyllis L.		01146	00001	C.2.1.1	--	--	--
			01146	00003	C.2.8.3	--	--	--
			01146	00005	C.2.4.1	--	--	--
	Hanski, Raimu K.		01090	00001	C.3.4.4	--	--	--
			01090	00002	C.2.3.1	--	--	--

C.9-224

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Hanski, Kathryn L.		01090	00003	C.3.1.2	--	--	--
			01090	00007	C.3.1.2	--	--	--
			01092	00001	C.3.4.4	--	--	--
			01092	00002	C.2.3.1	--	--	--
			01092	00003	C.3.1.2	--	--	--
	Hanson, Robert		01092	00007	C.3.1.2	--	--	--
			02563	00003	C.2.4.1	--	--	--
			02563	00004	C.2.4.1	--	--	--
	Hanson, Marcella J. Harb, Easa		02563	00005B	C.2.3.1	--	--	--
			02564	00001	C.2.1.1	--	--	--
	Hattrup, Susan Headley, Joe R. Hedge, Allen	Petition	01197	00001	C.2.3.3	--	--	--
			01197	00002	C.2.3	--	--	--
			01197	00003	C.2.3	--	--	--
			01197	00007	C.3.4.4	--	--	--
			01288	00001	C.3.4.4	--	--	--
	Hedge, Alan		00193	00001	C.3.4.4	--	--	--
			02550	00009	C.4.1.1	--	--	--
			02550	00011	C.3.1.2	--	--	--
			02550	00012	C.3.4.3	--	--	--
			02550	00013	C.3.4.3	--	--	--
			02550	00014	C.3.4.3	--	--	--
			02550	00015	C.2.1.1	--	--	--
	Heger, Marilyn		02550	00016	C.2.7	--	--	--
			02600	00007	C.2.1.1	--	--	--
	Heilgern, Anne		02600	00008	C.2.7	--	--	--
			01199	00001	C.2.3.3	--	--	--
			01199	00002	C.2.3	--	--	--
	Hellman, Glen		01199	00003	C.2.3	--	--	--
			01115	00001A	C.3.4.4	--	--	--
	Helstien, Beth J.		01115	00001B	C.2.8.1	--	--	--
			02320	00002	C.2.1.1	--	--	--
			02320	00003	C.3.1.2	--	--	--
			02320	00004	C.3.1.2	--	--	--
			02320	00005	C.2.3.1	--	--	--
			02320	00006	C.2.3.3	--	--	--
			02419	00001	C.2.4.1	--	--	--
		02419	00003	C.2.3.3	--	--	--	
		02419	00004	C.2.8.3	--	--	--	

C.9-225

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Hemphill, Jeanne T.		01129	00001	C.3.1.2	--	--	--
	Henry, David		02513	00001	C.3.1.2	--	--	--
			02513	00002	C.2.1.1	--	--	--
			02513	00003	C.2.4.1	--	--	--
			02513	00004	C.2.4.1	--	--	--
			02513	00005	C.2.6.1	--	--	--
			02513	00006	C.2.4.1	--	--	--
			02513	00007	C.2.4.1	--	--	--
			02513	00008	C.2.4.1	--	--	--
	Herman, Jon		01292	00001	C.3.4.4	--	--	--
			01292	00005	C.3.4.4	--	--	--
	Hess, Dr. George H.		02343	00001	C.3.4.4	--	--	--
			02343	00002	C.3.4.1	--	--	--
	Hess, Dr. George H.		02371	00001	C.3.4.4	--	--	--
			02371	00002	C.3.4.1	--	--	--
	Hinnen, Christine L.		00647	00001	C.3.4.4	--	--	--
			00647	00003	C.2.4.1	--	--	--
	Hinnen, Dr. Michael L.	Spokane Cardiology	00649	00001	C.3.4.4	--	--	--
			00649	00004	C.2.4.1	--	--	--
			00649	00005	C.2.5.2	--	--	--
			00649	00006	C.2.8.1	--	--	--
	Hinthorne, Royal A.		01325	00001	C.2.1.1	--	--	--
			01325	00002	C.3.1.2	--	--	--
			01325	00005	C.2.3.1	--	--	--
	Hinthorne, Grace L.		01326	00002	C.3.1.2	--	--	--
			01326	00003	C.2.3.1	--	--	--
	Hoffman, Mrs. A. A.		02082	00001	C.3.4.4	--	--	--
	Hohl, Dr. & Mrs. T.		00125	00001	C.3.4.4	--	--	--
			00125	00003	C.2.8.2	--	--	--
	Hood, George	Big Bend - Alberta, Ltd.	00199	00001	C.2.1.1	--	--	--
	Houff, Rev. William		02519	00001	C.2.3.1	--	--	--
			02519	00002	C.3.2	--	--	--
			02519	00003	C.2.3.1	--	--	--
	Houff, Patty		02551	00002	C.2.4.1	--	--	--
			02551	00003	C.2.4.1	--	--	--
			02551	00004	C.2.4.1	--	--	--
	Houff, Patty		02604	00002	C.2.4.1	--	--	--
	Houff, Dr. William Harper	Hanford Education Action League	02582	00001	C.2.4.1	--	--	--

C.9-226

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Houff, Dr. William Harper	Spokane Unitarian Church	02581	00001	C.2.3.1	--	--	--
			02581	00002	C.3.2	--	--	--
	Houghton, Mark		01127	00001	C.2.1.1	--	--	--
			01127	00004	C.2.8.3	--	--	--
			01127	00005	C.3.1.2	--	--	--
			01127	00006	C.2.1.1	--	--	--
	Houston, Jack		02276	00001	C.2.5.2	--	--	--
			02276	00002	C.2.4.1	--	--	--
	Houts-Mussey, Patty	Diocese of Yakima	00651	00001	C.5.11	C.5.10	C.5.11	C.2.8.3
	Hovis, James		02270	00001	C.2.1.1	--	--	--
	Hovis, Nancy		02271	00001	C.2.1.1	--	--	--
			02271	00003	C.3.4.4	--	--	--
			02271	00004	C.2.3.1	--	--	--
			02271	00005	C.2.3.1	--	--	--
	Hovis, James B.		02303	00001	C.2.1.1	--	--	--
	Hovis, Nancy E.		02304	00001	C.2.1.1	--	--	--
			02304	00003	C.3.4.4	--	--	--
			02304	00004	C.2.3.1	--	--	--
			02304	00005	C.2.8.2	--	--	--
	Hoyt/Thie, Daryl/Krista		01195	00001	C.2.1.1	--	--	--
	Hughes, Jim		02322	00001	C.2.1.2	--	--	--
			02322	00002	C.2.1.1	--	--	--
			02322	00003	C.2.6.1	C.6.4	--	--
			02322	00004	C.3.4.4	--	--	--
	Irwin, Lois S.		00317	00001	C.2.3.1	--	--	--
	Jakubal, Mike		00645	00001	C.3.4.4	--	--	--
	James, Ron		02516	00001	C.3.4.4	--	--	--
	Jim, Russell		02269	00001	C.2.1.1	--	--	--
			02269	00002	C.2.1.2	--	--	--
			02269	00003	C.2.4.1	--	--	--
	Johnson, Michael O.		00438	00002	C.3.1.2	--	--	--
	Johnson, Robert W.		01233	00005	C.2.8	--	--	--
	Johnson, Steve		02329	00005	C.3.1.2	--	--	--
	Johnson, Mayor Norman M.	City of Toppenish	02587	00001	C.3.4.4	--	--	--
	Johnson, Doreen	Plateau Preservation Society	00432	00001	C.2.3.1	--	--	--
			00432	00003	C.3.1.2	--	--	--
	Johnson, RN, Mary Lou	Spokane League of Women Voters	02572	00002	C.2.4.1	--	--	--
			02572	00003	C.2.3.1	--	--	--

C.9-227

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Kane, John T. & Family		00200	00001	C.3.4.4	--	--	--
	Kegan, Kyn		02346	00001	C.2.1.1	--	--	--
	Keller, C. Jo		00205	00001	C.3.4.4	--	--	--
	Kelley, William J.	Eastern Washington University	02613	00003	C.2.4.1	--	--	--
			02613	00005	C.7.3	C.2.4.1	--	--
			02613	00006	C.7.3	C.2.4.1	--	--
			02613	00007	C.7.3	C.2.4.1	--	--
			02613	00008	C.7.3	C.2.4.1	--	--
			02613	00009	C.7.3	C.2.4.1	--	--
			02613	00010	C.7.3	C.2.4.1	--	--
			02613	00011	C.7.3	C.2.4.1	--	--
			02613	00012	C.7.3	C.2.4.1	--	--
			02613	00013	C.7.3	C.2.4.1	--	--
	Kelly, Bill		02534	00001	C.2.4.1	--	--	--
			02534	00002	C.2.4.1	--	--	--
			02534	00003	C.2.4.1	--	--	--
			02534	00004	C.2.4.1	--	--	--
	Kessler, Donna		01335	00001	C.3.4.4	--	--	--
			01335	00002	C.3.4.4	--	--	--
			01335	00003	C.3.4.4	--	--	--
	Kiefel, Michael		02566	00004	C.2.3.1	--	--	--
	Kielpinski, Penelope A.		01536	00001	C.3.4.4	--	--	--
			01536	00003	C.3.4.4	--	--	--
			01536	00004	C.3.4.4	--	--	--
			01536	00005	C.3.1.2	--	--	--
			01536	00006	C.3.4.4	--	--	--
	Kieviet, Douglas R.		02565	00001	C.3.1.2	--	--	--
			02565	00002	C.2.6.2	--	--	--
	King, Alexander		00685	00001	C.3.4.4	--	--	--
			00685	00002	C.2.3.1	--	--	--
			00685	00003	C.3.1.2	--	--	--
			00685	00007	C.3.1.2	--	--	--
	King, Joseph E.	House of Representatives	01576	00001	C.3.1.2	--	--	--
			01576	00002	C.3.1.2	--	--	--
			01576	00003	C.2.1.2	--	--	--
	Kinne, Susan		00035	00001	C.3.4.4	--	--	--
	Kjolso, Mike		00686	00001	C.3.4.4	--	--	--
			00686	00002	C.2.3.1	--	--	--

G.9-228

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
			00686	00003	C.3.1.2	--	--	--
			00686	00007	C.3.1.2	--	--	--
	Kriedler, Senator Mike	Washington State Senate	00418	00001	C.3.4.4	--	--	--
			00418	00002	C.2.8	--	--	--
			00418	00003	C.3.4.4	--	--	--
			00418	00004	C.3.1.2	--	--	--
	Krueger, Robert F.		01342	00001	C.2.3.3	--	--	--
			01342	00002	C.3.1.2	--	--	--
			01342	00003	C.3.4.4	--	--	--
			01342	00004	C.2.4.1	--	--	--
			01342	00005	C.2.4.1	--	--	--
			01342	00008	C.2.2.1	--	--	--
			01342	00010	C.2.7	--	--	--
	Kuntz, Donn		00624	00001	C.3.1.2	--	--	--
			00624	00002	C.2.3.2	--	--	--
			00624	00003	C.2.3.1	--	--	--
			00624	00004	C.2.3.2	--	--	--
			00624	00005	C.3.1.2	--	--	--
			00624	00006	C.3.1.2	--	--	--
			00624	00007	C.3.1.2	--	--	--
			00624	00013	C.2.4.1	--	--	--
			00624	00015	C.3.1.2	--	--	--
			00624	00018	C.2.3.3	--	--	--
			00624	00020A	C.3.1.1	--	--	--
			00624	00022	C.2.8.1	--	--	--
			00624	00023	C.3.1.2	--	--	--
	Kuntz, Donn		02553	00001	C.3.1.2	--	--	--
			02553	00002	C.2.3	--	--	--
			02553	00003	C.2.3.1	--	--	--
			02553	00004	C.2.3.2	--	--	--
			02553	00005	C.3.1.2	--	--	--
			02553	00006	C.2.8.3	--	--	--
			02553	00012	C.2.4.1	--	--	--
	Kuntz, Don		01510	00001	C.2.2.1	--	--	--
			01510	00002	C.3.1.2	--	--	--
			01510	00003	C.2.3.2	--	--	--
	LaVassar, Joanne B.		00445	00001	C.3.4.4	--	--	--
			00445	00004	C.3.4.4	--	--	--

C.9-229

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	LaVassar, John		00687	00001	C.3.4.4	--	--	--
			00687	00002	C.2.3.1	--	--	--
			00687	00003	C.3.1.2	--	--	--
			00687	00007	C.3.1.2	--	--	--
	LaVassar, Joanne		00688	00001	C.3.4.4	--	--	--
			00688	00002	C.2.3.1	--	--	--
			00688	00003	C.3.1.2	--	--	--
			00688	00007	C.3.1.2	--	--	--
	Laddin, Judy		02548	00001	C.3.1.2	--	--	--
	Laddon, Judy		02598	00001	C.3.1.2	--	--	--
	Laise, Johnny		02357	00001	C.2.7.1	--	--	--
			02357	00002	C.2.2.1	--	--	--
			02357	00003	C.2.6.1	--	--	--
			02357	00008	C.2.5.1	--	--	--
	Lange, Kristen		02435	00001	C.3.4.4	--	--	--
	Larson, William H.		02615	00001	C.3.4.4	--	--	--
	Lasmanis, Raymond	WA State, Dept. Natural Resources	01513	00005	C.7.2.1	C.2.7	--	--
			01513	00007	C.2.4.1	--	--	--
			01513	00008	C.2.4.1	--	--	--
			01513	00009	C.2.4.1	--	--	--
			01513	00010	C.2.6.1	--	--	--
			01513	00010A	C.2.6.1	--	--	--
			01513	00010B	C.2.4.1	--	--	--
			01513	00011	C.2.4.1	--	--	--
			01513	00054	C.3.4.3	--	--	--
	Lawrence, Robert C.		02412	00001	C.2.3.1	--	--	--
	Lawson, Kevin C.		00370	00001	C.3.4.4	--	--	--
			00370	00002	C.3.1.2	--	--	--
	Lazar, David		02342	00001	C.3.4.4	--	--	--
	Leaumont, Richard-J.	Lower Columbia Basin Audubon Soc.	01125	00002	C.3.1.2	--	--	--
			01125	00003	C.2.3.3	--	--	--
	Leibert, Sharon		00113	00001	C.2.8.2	--	--	--
			00113	00002	C.2.8.2	--	--	--
			00113	00003	C.3.4.4	--	--	--
			00113	00004	C.3.4.4	--	--	--
	Leutz, Linda		00408	00001	C.3.4.4	--	--	--
			00408	00002	C.7.3	--	--	--
			00408	00005	C.3.4.4	--	--	--

C.9-230

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Lewis, Robin L.		00393	00001	C.3.4.4	--	--	--
	Lewis, Lynne E.		00666	00001	C.3.4.4	--	--	--
			00666	00002	C.3.4.4	--	--	--
	Liebeler, Penelope		02102	00001	C.3.4.4	--	--	--
	Long, Bobbi Davis		01170	00001	C.3.4.4	--	--	--
			01170	00002	C.3.4.4	--	--	--
	Lorenzo, A. Jane		00550	00001	C.3.4.4	--	--	--
	Lunde, Barbara J.		00492	00001	C.2.8.1	--	--	--
	Lutes, Joy L.		00512	00001	C.3.4.4	--	--	--
			00512	00002	C.3.4.4	--	--	--
			00512	00003	C.3.4.4	--	--	--
			00512	00004	C.2.1.1	--	--	--
	Lutes, Joy		02325	00001	C.3.4.4	--	--	--
			02325	00002	C.2.3.3	--	--	--
			02325	00004	C.2.1.1	--	--	--
	Lyon, James M.		00285	00001	C.3.4.4	--	--	--
	Maag, Judith R.		00684	00001	C.3.4.4	--	--	--
			00684	00002	C.2.3.1	--	--	--
			00684	00003	C.3.1.2	--	--	--
			00684	00007	C.3.1.2	--	--	--
	Maloney, Mrs. D. K.		00481	00001	C.3.1.2	--	--	--
			00481	00003	C.3.4.4	--	--	--
	Mangan, Al		00094	00001	C.2.1.1	--	--	--
	Mangan, Al		02546	00001	C.2.4.1	--	--	--
			02546	00002	C.2.4.1	--	--	--
			02546	00003	C.2.4.1	--	--	--
			02546	00004	C.2.1.1	--	--	--
			02546	00005	C.2.7	--	--	--
	Mangan, Al		02597	00001	C.2.4.1	--	--	--
			02597	00002	C.2.6.2	--	--	--
			02597	00003	C.2.4.1	--	--	--
			02597	00004	C.2.4.1	--	--	--
			02597	00005A	C.2.4.1	--	--	--
			02597	00005B	C.2.8.3	--	--	--
			02597	00006	C.2.4.1	--	--	--
			02597	00007	C.2.4.1	--	--	--
			02597	00009	C.2.7	--	--	--
			02597	00010	C.2.7	--	--	--

G.9-231

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Mangan, Al	HCR1	01240	00001	C.2.6	--	--	--
			01240	00002	C.2.4.1	--	--	--
			01240	00003	C.2.8.2	--	--	--
			01240	00004	C.2.4.1	--	--	--
			01240	00005	C.2.4.1	--	--	--
			01240	00006	C.2.4.1	--	--	--
			01240	00008	C.2.4.1	--	--	--
			01240	00009	C.2.4.1	--	--	--
			01240	00011	C.2.4.1	--	--	--
			01240	00012	C.2.8.3	--	--	--
			01240	00013	C.2.4.1	--	--	--
			01240	00014	C.2.7	--	--	--
			01240	00015	C.2.4.1	C.7.3	--	--
			01240	00016	C.2.4.1	--	--	--
			01240	00018	C.2.4.1	--	--	--
			01240	00019	C.2.4.1	--	--	--
			01240	00022	C.2.8.3	--	--	--
			01240	00023	C.2.4.1	--	--	--
	Marcus, Allan H.	Washington State University	00625	00006	C.2.8.2	--	--	--
	Mayer, William H.	FEMA, RX	00255	00001	C.2.7	--	--	--
			00255	00002	C.2.4.1	--	--	--
	McAllister, Maxine		00682	00001	C.2.3.3	--	--	--
			00682	00002	C.2.3.1	--	--	--
			00682	00003	C.3.1.2	--	--	--
			00682	00007	C.3.1.2	--	--	--
	McAllister, Susan		01091	00001	C.3.4.4	--	--	--
			01091	00002	C.2.3.1	--	--	--
			01091	00003	C.3.1.2	--	--	--
			01091	00007	C.3.1.2	--	--	--
	McClain, Charles		00314	00001	C.2.3.2	--	--	--
			00314	00002	C.2.3.1	--	--	--
			00314	00003	C.3.4.4	--	--	--
			00314	00004	C.2.8.2	--	--	--
	McCrea, Steve		02518	00001	C.2.4.1	--	--	--
			02518	00002	C.2.4.1	--	--	--
			02518	00003	C.2.4.1	--	--	--
			02518	00004	C.2.4.1	--	--	--
			02518	00005	C.2.4.1	--	--	--

C.9-232

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	McKay, Jeffrey		02324	00001	C.2.1.1	--	--	--
	McKusick, Helen		00364	00001	C.3.4.4	C.3.4.4	--	--
			00364	00003	C.3.4.4	--	--	--
	McVicker, Carol		02547	00001	C.2.4.1	--	--	--
			02547	00002	C.2.4.1	--	--	--
			02547	00005	C.2.5.1	--	--	--
	Mcword, Keith		02429	00001	C.3.1.2	--	--	--
	Meeker, Eugenia		02288	00001	C.3.1.2	--	--	--
	Metheny, David		02393	00001	C.3.4.4	--	--	--
	Mickelson, Amy		00616	00001	C.3.1.2	--	--	--
			00616	00002	C.3.1.1	--	--	--
			00616	00003	C.3.1.2	--	--	--
			00616	00007	C.3.1.1	--	--	--
			00616	00014	C.2.8.3	--	--	--
			00616	00019	C.3.1.1	--	--	--
			00616	00020A	C.2.3.2	--	--	--
			00616	00020B	C.2.6.3	--	--	--
			00616	00021	C.2.2.1	--	--	--
			00616	00022	C.2.1.1	--	--	--
			00616	00023	C.3.1.2	--	--	--
			00616	00025	C.2.7	--	--	--
			00616	00026	C.2.7	--	--	--
			00616	00027	C.2.8.2	--	--	--
			00616	00028	C.2.8	--	--	--
	Mickelson, Amy		02544	00001	C.3.1.2	--	--	--
			02544	00002	C.3.1.1	--	--	--
			02544	00004	C.2.2.1	--	--	--
			02544	00005	C.2.3.2	--	--	--
	Mickelson, Amy		02596	00001	C.3.1.2	--	--	--
			02596	00002	C.3.1.1	--	--	--
			02596	00004	C.3.1.1	--	--	--
	Miles, Joe		01356	00001	C.3.4.4	--	--	--
	Miller, Michael Barrett		00213	00001	C.3.4.4	--	--	--
	Mineke, Jim & Ruth		00662	00001	C.3.4.4	--	--	--
	Mizrahi, Nancy Kelley		01228	00001	C.4.2.1	C.5.1	--	--

C:9-233

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
			01228	00002	C.3.4.1	--	--	--
			01228	00003	C.3.1.2	--	--	--
			01228	00004	C.3.4.2.3	--	--	--
			01228	00005	C.3.4.3	--	--	--
			01228	00006	C.3.1.2	--	--	--
	Montague, Evelyn		01166	00001	C.2.4.1	C.3.1.2	C.3.2	--
			01166	00002	C.2.7	C.2.1.1	--	--
	Moomaw, Alan		01081	00001	C.3.1.2	--	--	--
			01081	00002	C.3.4.4	C.3.1.2	--	--
			01081	00003	C.3.1.2	--	--	--
			01081	00005	C.3.4.3	--	--	--
			01081	00006	C.3.1.2	--	--	--
	Moon, S.A.	WA State, Dept. of Transportation	01515	00004	C.2.4.1	--	--	--
			01515	00009	C.3.4.3	--	--	--
			01515	00010	C.2.7	--	--	--
	Mootry, Joan		02517	00001	C.2.1.2	--	--	--
			02517	00002	C.2.8.3	--	--	--
			02517	00003	C.2.1.1	--	--	--
			02517	00004	C.2.3.1	--	--	--
	Morris, Newton		02405	00001	C.2.1.1	--	--	--
			02405	00003	C.3.1.2	--	--	--
			02405	00004	C.3.1.2	--	--	--
	Mote, Karl W.	Mining Association	01503	00001	C.2.4.1	--	--	--
	Mote, Karl W.	Northwest Mining Association	00442	00001	C.3.4.4	--	--	--
	Neff, Mary E.		00097	00001	C.2.8.1	--	--	--
	Nelson, Milton		00336	00003	C.3.4.4	--	--	--
	Nelson, Marcella		00556	00001	C.3.4.4	--	--	--
			00556	00002	C.2.4.1	--	--	--
	Nelson, Dick		02331	00003	C.7.4	C.2.2	--	--
			02331	00004	C.2.1.1	--	--	--
	Newell, Greg		00416	00001	C.2.8.2	--	--	--
	Noll, Alice		02392	00001	C.2.6.1	--	--	--
			02392	00003	C.2.1.1	--	--	--
	Novak, Terry		02526	00002	C.2.4.1	--	--	--
	Novak, Terry L.	City of Spokane	02589	00002	C.2.4.1	--	--	--
	Nuess, Mike		02533	00001	C.3.4.4	--	--	--
			02533	00002	C.2.7	C.5.1	--	--
			02533	00003	C.2.8.2	--	--	--

C.9-234

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Neuss, Mike		02591	00001	C.3.4.4	--	--	--
			02591	00002A	C.2.7	--	--	--
	Nutley, Representative Busse	Wash State House Representatives	02591	00005	C.2.5.1	--	--	--
	Nwab, Charles		01596	00002	C.2.8.3	--	--	--
	Nylander, Donna		02293	00001	C.3.1.2	--	--	--
			02522	00001	C.2.3.1	--	--	--
			02522	00002	C.2.3.1	--	--	--
			02522	00003	C.2.4.1	--	--	--
			02522	00006	C.2.1.1	--	--	--
	Nylander, Donna	City of Ellensburg	01307	00001	C.2.1.1	--	--	--
			01307	00002	C.2.3	--	--	--
			01307	00003	C.2.4.1	--	--	--
			01307	00004	C.2.3	--	--	--
			01307	00005	C.2.3	--	--	--
			01307	00006	C.2.3.3	--	--	--
	O'Neal, Diane		00324	00001	C.3.4.4	--	--	--
	O'Neal, Diane		00667	00002	C.3.4.4	--	--	--
	O'Reilly-Doyle, Kathleen		01322	00001	C.3.4.3	--	--	--
			01322	00006	C.2.4.1	--	--	--
	Oliver, Dan		00166	00001	C.3.4.4	--	--	--
	Olsen, Gordon D. & Bonnie A.		01315	00003	C.2.3.2	--	--	--
	Oram, Jr., Ray		02382	00001	C.2.5.2	--	--	--
			02382	00002	C.2.8.1	--	--	--
	Ortman, David E.		02375	00001	C.2.6.1	--	--	--
			02375	00002	C.3.1.2	--	--	--
	Otto, Dale		01324	00001	C.3.4.4	--	--	--
			01324	00003	C.2.4.1	--	--	--
			01324	00004	C.2.4.1	--	--	--
	Packer, SE		01121	00001	C.3.4.4	--	--	--
			01121	00002	C.3.4.4	--	--	--
	Para, Molly J.		00535	00001	C.3.4.4	--	--	--
	Parson, Janice		02266	00001	C.2.1.1	--	--	--
	Partain, Dr. William L.		01114	00001	C.3.4.4	--	--	--
			01114	00002	C.2.3.3	--	--	--
			01114	00003	C.3.4.4	--	--	--
	Paul, Alexa Drew		00335	00001	C.3.4.4	--	--	--
	Pellett, Howard		00072	00001	C.3.4.4	--	--	--
	Penberthy, Larry		02312	00004	C.2.4.2	--	--	--

C.9-235

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Penberthy, H. Larry		02620	00001	C.2.3.1	--	--	--
			02620	00002	C.3.3	--	--	--
	Penberthy, Larry	Penberthy Electromelt Int'l Inc.	02358	00001	C.3.1.2	--	--	--
			02358	00002	C.3.1.2	--	--	--
	Penberthy, Larry		02359	00001	C.2.7	--	--	--
	Pence, Mark		02292	00001	C.2.1.1	--	--	--
			02292	00002	C.2.1.1	--	--	--
	Peterson, Warren S.		00482	00002	C.2.4.1	--	--	--
			00482	00003	C.2.8	--	--	--
			00482	00004	C.3.1.2	--	--	--
			00482	00007	C.3.4.1	--	--	--
			00482	00009	C.3.1.2	--	--	--
			00482	00010	C.3.4.4	--	--	--
	Peterson, M.		00672	00001	C.3.4.4	--	--	--
	Pierglund, D. E.	WASHPIRG	02439	00001	C.3.4.4	--	--	--
	Pilcher, Patrick		02396	00001	C.2.1.1	--	--	--
			02396	00002	C.2.6.1	--	--	--
	Pilcher, Patrick L.		02427	00005	C.3.4.4	--	--	--
			02427	00006	C.2.3.2	--	--	--
	Platt, Chris		02339	00001	C.3.1.2	--	--	--
			02339	00004	C.2.4.1	--	--	--
	Platt, Chris		02369	00001	C.3.1.2	--	--	--
			02369	00002	C.3.4.1	--	--	--
			02369	00004	C.2.4.1	--	--	--
	Plattner, Jacqueline		02401	00008	C.2.4.1	--	--	--
			02401	00009	C.2.4.1	--	--	--
	Poeter, Eileen	Dept. Civil & Environ. Engr.	01525	00001	C.2.7	--	--	--
	Poinor, Mayor John		02557	00001	C.2.4.1	--	--	--
			02557	00003	C.2.1.1	--	--	--
	Pollet, Gerald		02399	00001	C.2.1.1	--	--	--
			02399	00002	C.2.1.1	--	--	--
			02399	00003	C.2.1.1	--	--	--
			02399	00004	C.2.4.3	--	--	--
			02399	00005	C.2.6.1	--	--	--
			02399	00006	C.2.6.1	--	--	--
			02399	00007	C.2.3.3	--	--	--
			02399	00008	C.3.4.3	--	--	--
	Powell, Walbridge J.		02380	00001	C.2.7	--	--	--

C.9-236

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
			02380	00002	C.2.8.2	--	--	--
			02380	00007	C.3.1.2	--	--	--
			02380	00010	C.2.1.1	--	--	--
	Powell, Walbridge J.		02421	00001	C.2.7	--	--	--
			02421	00002	C.2.8.2	--	--	--
	Power, Max	Washington State Legislature	01499	00001	C.3.4.4	--	--	--
			01499	00002	C.3.4.3	--	--	--
			01499	00003	C.3.4.3	--	--	--
			01499	00004	C.3.4.3	--	--	--
			01499	00005	C.3.4.3	--	--	--
			01499	00006	C.3.4.3	--	--	--
			01499	00007	C.3.4.3	--	--	--
			01499	00008	C.3.4.3	--	--	--
			01499	00009	C.3.4.4	--	--	--
			01499	00010	C.3.4.3	--	--	--
			01499	00011	C.3.4.3	--	--	--
			01499	00012	C.3.4.3	--	--	--
			01499	00013	C.3.4.3	--	--	--
			01499	00014	C.3.4.3	--	--	--
			01499	00015	C.3.4.3	--	--	--
			01499	00016	C.3.4.3	--	--	--
			01499	00017	C.3.4.3	--	--	--
			01499	00018	C.3.4.3	--	--	--
			01499	00019	C.3.4.3	--	--	--
			01499	00020	C.3.4.3	--	--	--
			01499	00021	C.3.4.4	--	--	--
	Poyner, Mayor John	City of Richland	02301	00001	C.2.4.1	--	--	--
			02301	00003	C.2.1	--	--	--
	Poyner, Mayor John		02602	00001	C.2.4.1	--	--	--
			02602	00003	C.2.1.1	--	--	--
	Poyner, Mayor John		02264	00001	C.2.4.1	--	--	--
			02264	00003	C.2.1.1	--	--	--
	Price, Eleanor		02344	00001	C.2.1.1	--	--	--
			02344	00002	C.3.1.2	--	--	--
	Quigley, Phillip		02340	00001	C.3.4.2.2	--	--	--
			02340	00003	C.2.3.1	--	--	--
			02340	00004	C.2.1.1	--	--	--
			02340	00006	C.2.6	--	--	--

G.9-237

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Ramsey, Colleen		02340	00007	C.3.4.4	--	--	--
			01200	00001	C.2.3.3	--	--	--
			01200	00002	C.2.3	--	--	--
			01200	00003	C.2.3	--	--	--
	Rapport, Dr. Richard Redfearn, Brett		01200	00007	C.3.4.4	--	--	--
			02387	00001	C.2.8.2	--	--	--
			02330	00001	C.3.1.1	--	--	--
			02330	00002	C.3.1.2	--	--	--
			02330	00003	C.2.2	--	--	--
			02330	00004	C.2.7.1	--	--	--
			02330	00005	C.2.4.3	--	--	--
			02330	00006	C.2.6.1	--	--	--
			02330	00007	C.2.1.1	--	--	--
			02341	00001	C.2.4.1	--	--	--
	Redfearn, Brett Reel, David		02403	00003	C.3.1.2	--	--	--
			02403	00004	C.2.5.2	--	--	--
			02403	00006	C.2.4.1	--	--	--
			02403	00022	C.3.4.1	--	--	--
			02403	00029	C.2.3.1	--	--	--
			02403	00030	C.2.3.1	--	--	--
			02403	00031	C.3.1.1	--	--	--
			02403	00032	C.2.4.3	--	--	--
			02403	00033	C.3.1.2	--	--	--
			02426	00001	C.2.3.1	--	--	--
	Reel, David		02426	00003	C.2.2.1	--	--	--
			02426	00005	C.3.4	--	--	--
			02426	00007	C.2.7	C.7.4	--	--
			02426	00008	C.3.1.2	--	--	--
			02426	00009	C.2.5.2	--	--	--
			02426	00011	C.2.4.1	--	--	--
			02426	00027	C.3.4.3	--	--	--
			02426	00034	C.2.3.1	--	--	--
			02426	00035	C.2.3.1	--	--	--
			02426	00036	C.3.1.1	--	--	--
			02426	00037	C.2.4.3	--	--	--
			02426	00038	C.3.1.2	--	--	--
			02426	00039	C.2.7	--	--	--
	Renaud, Mary		01574	00001	C.3.4.4	--	--	--

C.9-238

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Reynolds, Edward A.		02570	00001	C.2.5.2	--	--	--
	Richardson, Barbara		02541	00001A	C.3.4.4	--	--	--
			02541	00001B	C.3.1.2	--	--	--
			02541	00001C	C.3.4.4	--	--	--
	Richmond, Teresa N.		01131	00001	C.3.3	--	--	--
			01131	00002	C.2.3.1	--	--	--
	Ridgeway, John		02350	00001	C.2.1.1	--	--	--
	Risbell, Marian		00362	00001	C.3.1.2	--	--	--
			00362	00002	C.2.3.2	--	--	--
			00362	00003	C.2.8.3	--	--	--
			00362	00005	C.3.1.2	--	--	--
			00362	00008	C.2.5.1	--	--	--
	Robillard, Mrs. F. E.		02081	00001	C.3.4.4	--	--	--
	Rose, Bob		02327	00001	C.2.2	--	--	--
			02327	00002	C.2.2	--	--	--
			02327	00003	C.3.1.2	--	--	--
			02327	00004	C.2.4.3	--	--	--
			02327	00005	C.3.1.2	--	--	--
			02327	00006	C.3.1.2	--	--	--
			02327	00007	C.2.3.1	--	--	--
			02327	00008	C.2.3.1	--	--	--
			02327	00010	C.2.8.3	--	--	--
	Rose, Bob		02628	00001	C.2.2	--	--	--
			02628	00002	C.2.2	--	--	--
			02628	00003	C.3.3	--	--	--
			02628	00004	C.2.4.3	--	--	--
			02628	00005	C.3.1.2	--	--	--
			02628	00006	C.3.1.2	--	--	--
			02628	00007	C.2.3.1	--	--	--
			02628	00008	C.2.3.1	--	--	--
			02628	00010	C.2.8.3	--	--	--
	Rosenberg, Leslie		02413	00001	C.3.4.4	--	--	--
			02413	00002	C.2.3.1	--	--	--
	Ross, Kathleen A.	Heritage College	01222	00001	C.3.1.2	--	--	--
			01222	00003	C.3.1.2	--	--	--
	Rowland, Skip		02528	00001	C.2.4.1	--	--	--
	Runestrand, Sally		02616	00001	C.3.1.2	C.7.2	--	--
	Rupel, William E.		02299	00001	C.3.4.4	--	--	--

C.9-239

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Rupel, William E.	Department of Energy	02261	00001	C.3.4.4	--	--	--
	Russell, Mary and James		00457	00001	C.3.4.4	--	--	--
	Rust, Michael S.		01530	00001	C.3.4.4	--	--	--
	Ryan, Chilton "Tope"		01355	00001	C.2.3.1	--	--	--
			01355	00007	C.2.6.1	--	--	--
			01355	00008	C.3.4.4	--	--	--
	Sampson, Vice-Chair, Melvin R.	Yakima Indian Nation	01273	00004	C.3.1.2	--	--	--
			01273	00005	C.3.1.2	--	--	--
			01273	00041	C.3.1.1	--	--	--
			01273	00095	C.3.1.2	--	--	--
			01273	00096	C.3.4.3	--	--	--
			01273	00097	C.3.4.1	--	--	--
			01273	00098	C.3.4.1	--	--	--
			01273	00099	C.3.4.1	--	--	--
			01273	00100	C.3.4	--	--	--
			01273	00101	C.3.4	--	--	--
			01273	00102	C.3.4.2	--	--	--
			01273	00103	C.3.4.2.1	--	--	--
			01273	00104	C.3.4	--	--	--
			01273	00105	C.3.4	--	--	--
			01273	00106	C.3.4.2.2	--	--	--
			01273	00107	C.3.4	--	--	--
			01273	00108	C.3.4	--	--	--
			01273	00109	C.3.4.2.3	--	--	--
			01273	00110	C.3.4.3	--	--	--
			01273	00112	C.3.4.3	--	--	--
			01273	00113	C.3.4.3	--	--	--
			01273	00114	C.7.3	--	--	--
			01273	00115	C.2.4.1	--	--	--
			01273	00116	C.2.4.1	--	--	--
			01273	00117A	C.3.4.4	--	--	--
			01273	00117B	C.2.4.1	--	--	--
			01273	00118	C.3.4.3	--	--	--
			01273	00119	C.3.4.3	--	--	--
			01273	00120	C.2.2	--	--	--
			01273	00121	C.2.3.1	--	--	--
			01273	00129	C.3.4.3	--	--	--
			01273	00130	C.3.1.2	--	--	--

C.9-240

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington</u> (continued)								
			01273	00136	C.3.4.3	--	--	--
			01273	00138	C.2.4.1	--	--	--
			01273	00139	C.2.3.3	--	--	--
	Saracino, Jr., Anthony V.		00349	00004	C.3.1.2	--	--	--
	Savage, Cathy		01155	00001	C.3.4.4	--	--	--
			01155	00002	C.2.4.1	--	--	--
			01155	00003	C.3.1.2	--	--	--
	Sauers, Jack		00250	00003	C.3.1.2	--	--	--
	Scherpelz, Robert I.		00675	00001	C.3.4.4	--	--	--
			00675	00002	C.2.1.1	--	--	--
	Schmidt, Cynthia M.		00665	00001	C.3.4.4	--	--	--
	Schmidt, Bob		02280	00001	C.2.3.1	--	--	--
			02280	00002	C.3.1.2	--	--	--
			02280	00003	C.2.1.2	--	--	--
	Schoen, Mayor George A.	Town of South Cle Elum	00238	00001	C.3.1.2	--	--	--
			00238	00002	C.3.1.2	--	--	--
	Schultz, Stephen		01196	00001	C.2.3.3	--	--	--
			01196	00002	C.2.3	--	--	--
			01196	00003	C.2.3	--	--	--
			01196	00007	C.3.4.4	--	--	--
	See, Molly		01327	00001	C.3.4.4	--	--	--
			01327	00002	C.3.4.4	--	--	--
			01327	00003	C.3.4.2.1	--	--	--
			01327	00004	C.3.4.1	--	--	--
			01327	00005	C.2.3.1	--	--	--
	See, Molly		02268	00001	C.2.1.1	--	--	--
	See, Elizabeth		02437	00001	C.2.1.1	--	--	--
	Seidl, Bryce	City of Vancouver	01053	00001	C.2.3.3	--	--	--
			01053	00002	C.2.5.2	--	--	--
			01053	00003	C.3.4.4	--	--	--
	Sharples, Vivien		02430	00002	C.3.4.4	--	--	--
	Shay, Mr. & Mrs. Rodney O.		00454	00001	C.3.4.4	--	--	--
	Sheffter, Nancy		01080	00001	C.3.4.4	--	--	--
	Sheppard, Irene		00433	00001	C.3.1.2	--	--	--
	Sheroke, Charles		02567	00001	C.2.2.2	--	--	--
			02567	00002	C.2.4.1	--	--	--
	Shields, Walter W.		02540	00003	C.2.4.1	--	--	--
			02540	00004	C.2.4.1	--	--	--

C.9-241

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Shields, Walter W.		02595	00003	C.2.4.1	--	--	--
			02595	00004	C.2.4.1	--	--	--
	Shook, Larry		02558	00001	C.3.1.2	C.2.3.1	--	--
			02558	00001A	C.3.4.4	--	--	--
			02558	00001B	C.2.3.1	--	--	--
			02558	00002	C.2.3.1	--	--	--
	Sisk, Robert	Nuclear Weapons Freeze Coalition	02101	00001	C.3.4.4	--	--	--
	Skala, Mayor Ernest J.	City of North Bonneville	01203	00001	C.2.1.1	--	--	--
			01203	00002	C.2.2	--	--	--
			01203	00003	C.2.6.1	--	--	--
			01203	00005	C.2.3	--	--	--
			01203	00006	C.7.4	C.3.2	--	--
			01203	00007	C.3.1.2	--	--	--
			01203	00008	C.2.1.1	--	--	--
			01203	00009	C.2.3.3	--	--	--
			01203	00014	C.3.1.2	--	--	--
			01203	00015	C.2.3	--	--	--
			01203	00016	C.3.1.2	--	--	--
	Smith, Pam		00143	00002	C.2.8.2	--	--	--
	Smith, Ben		00174	00002	C.2.8.1	--	--	--
	Smith, Al		00397	00005	C.2.7	--	--	--
	Snow, Jeanne Cartter		01328	00001	C.3.1.2	--	--	--
			01328	00002	C.2.1.1	--	--	--
	Soveroski, Marie		01281	00005	C.3.4.3	--	--	--
			01281	00007	C.2.3.1	--	--	--
			01281	00008	C.2.8.3	--	--	--
	Soveroski, Marie		02511	00007	C.2.3	--	--	--
	Spitznagel, Steve		01147	00001	C.3.4.4	--	--	--
			01147	00004	C.2.6.1	--	--	--
			01147	00006	C.2.8.3	--	--	--
			01147	00007	C.2.3.2	--	--	--
	Stack, Karen		00631	00002	C.3.1.2	--	--	--
	Stewart, Loretta		00119	00001A	C.3.4.4	--	--	--
			00119	00001E	C.3.4.4	--	--	--
	Stewart, Cheryl		00417	00001	C.3.1.2	--	--	--
			00417	00003	C.2.3.1	--	--	--
			00417	00004	C.2.3.1	--	--	--
	Stiles, Kim		01073	00001	C.3.4.4	--	--	--

C.9-242

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Storey, Ann		02282	00001	C.2.3.3	--	--	--
	Swanson, Susan		00632	00002	C.3.1.2	--	--	--
	Swanson, Elizabeth M.	Clark County Pomona No. 1	01537	00001	C.3.1.2	--	--	--
	Swatzell, June		00547	00001	C.3.4.4	--	--	--
			00547	00002	C.2.3.1	--	--	--
	Szulinski, M.J.		01346	00001	C.2.5	--	--	--
			01346	00002	C.3.1.2	--	--	--
			01346	00003	C.3.1.2	--	--	--
			01346	00004	C.3.4.3	--	--	--
			01346	00005	C.5.8	--	--	--
			01346	00012	C.3.4.4	--	--	--
	Taggart, Tom		02524	00001	C.2.4.1	--	--	--
	Talkington, Scott		00130	00001	C.3.1.2	--	--	--
			00130	00003	C.3.4.4	--	--	--
			00130	00004	C.3.1.2	--	--	--
	Tatom, Jeff		02414	00002	C.2.4.1	--	--	--
			02414	00003	C.2.3.3	--	--	--
			02414	00004	C.2.3.3	--	--	--
	Taylor, Paul J.		02574	00001	C.2.8.2	--	--	--
	Telford, Paul		02318	00001	C.2.1.1	--	--	--
	Thatcher, H. Stanton & Barbara		01164	00001	C.3.4.4	--	--	--
			01164	00005	C.3.4.4	--	--	--
			01164	00006	C.3.4.4	--	--	--
	Thomas, James P.		00483	00001	C.3.1.1	--	--	--
			00483	00003	C.2.3.3	--	--	--
			00483	00004	C.2.7	--	--	--
			00483	00005	C.3.1.2	--	--	--
			00483	00006	C.3.4.3	--	--	--
			00483	00007A	C.3.4	--	--	--
			00483	00007B	C.3.4	--	--	--
			00483	00008A	C.2.3.2	--	--	--
			00483	00008B	C.2.7	--	--	--
			00483	00008C	C.2.7	--	--	--
			00483	00009	C.2.1.1	--	--	--
	Thomas, Angelina Cory		01126	00001	C.2.8.1	--	--	--
			01126	00002A	C.3.1.2	--	--	--
			01126	00002B	C.3.1.2	--	--	--
			01126	00003	C.2.8.1	--	--	--

C.9-243

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Thomas, James		01126	00005	C.2.4.1	--	--	--
			02512	00001	C.3.1.1	--	--	--
			02512	00003	C.2.7	--	--	--
			02512	00004	C.2.5.2	--	--	--
			02512	00005	C.3.4.3	--	--	--
			02512	00006	C.3.4.3	--	--	--
			02512	00007	C.3.4.3	--	--	--
			02512	00008	C.3.1.2	--	--	--
			02512	00009	C.3.4.4	--	--	--
			02512	00010	C.2.3.2	--	--	--
			02512	00011	C.3.1.2	--	--	--
			02512	00012	C.2.7	--	--	--
	Thomas, James P.		02575	00001	C.3.1.1	--	--	--
			02575	00003	C.2.7	--	--	--
			02575	00004	C.2.5.2	--	--	--
			02575	00005	C.3.4.3	--	--	--
			02575	00006	C.3.4.3	--	--	--
			02575	00007	C.3.4.3	--	--	--
			02575	00008	C.3.1.2	--	--	--
			02575	00009	C.3.1.1	--	--	--
			02575	00010	C.2.8	--	--	--
			02575	00011	C.3.1.1	--	--	--
			02575	00012	C.2.8	--	--	--
	Tickner, Arthur L. and Wyn		00390	00001	C.3.1.2	--	--	--
			00390	00002	C.2.5.1	--	--	--
			00390	00003	C.3.4.4	--	--	--
	Tisch, Shirley		01067	00001	C.3.4.4	--	--	--
	Tollackson, Dorothy		00450	00001	C.3.4.4	--	--	--
			00450	00002	C.3.1.2	--	--	--
	Towne, Henry		01505	00001	C.2.5.2	--	--	--
	Townsend, Shari		02109	00002	C.5.11	--	--	--
			02109	00003	C.2.4.1	--	--	--
	Turnbull, David S.		00664	00001	C.3.4.4	--	--	--
	Tuttle, Daniel and Barbara		00434	00001	C.3.1.2	--	--	--
			00434	00002	C.3.1.2	--	--	--
	Unsoeld, Jolene	House of Rep. State of Washington	01236	00001	C.2.1.1	--	--	--
			01236	00002	C.3.4.3	--	--	--
			01236	00003	C.3.1.3	C.6.4	--	--

C.9-244

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Unterschuetz, Susan		01236	00006	C.3.4.4	--	--	--
	Valenzuela, Karengale		02559	00001	C.2.1.1	--	--	--
			01120	00001	C.3.4.4	--	--	--
			01120	00004	C.2.4.1	--	--	--
			01120	00005	C.3.4.4	--	--	--
	Vinson, Greg		02417	00001	C.3.1.2	--	--	--
	Volpentest, Sam	Tri-City Nuclear Industrial	02263	00001	C.2.1.1	--	--	--
			02263	00002	C.2.1.2	--	--	--
			02263	00003	C.2.1.2	--	--	--
	Wahl, Kathleen M.		02415	00001	C.2.1.1	--	--	--
	Walters, C.		00212	00001	C.3.4.4	--	--	--
	Wardle, Jay		01124	00001	C.3.3.1	--	--	--
			01124	00002	C.2.7	--	--	--
			01124	00006	C.2.8.3	--	--	--
			01124	00007	C.2.6.3	--	--	--
	Warner, James E.		01283	00001	C.3.4.4	--	--	--
			01283	00002	C.2.3.1	--	--	--
			01283	00003	C.3.1.2	--	--	--
			01283	00007	C.3.4.4	--	--	--
	Warren, Roselee		01229	00001	C.2.4.3	--	--	--
			01229	00002	C.3.1.2	--	--	--
			01229	00003	C.3.1.2	--	--	--
			01229	00004	C.2.8.2	--	--	--
	Warwick, Lorintha		02525	00001	C.3.4.4	--	--	--
	Washburn, Steve R.		02316	00001	C.2.1.1	C.7.3	C.3.1.2	--
			02316	00002	C.2.1.1	--	--	--
	Washburn, Steve R.		02626	00001	C.3.4.4	--	--	--
			02626	00002	C.2.1.1	--	--	--
	Watts, Peggy		01205	00001	C.3.1.2	--	--	--
	Weiner, Ruth		02332	00001	C.2.1.1	--	--	--
			02332	00002	C.2.8.3	--	--	--
			02332	00003	C.3.4.4	--	--	--
			02332	00004	C.3.1.2	--	--	--
			02332	00007	C.3.1.2	--	--	--
			02332	00008	C.3.1.2	--	--	--
			02332	00010	C.2.5.2	--	--	--
			02332	00011	C.2.2.1	--	--	--
			02332	00025	C.3.1.2	--	--	--

C.9-245

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Weiner, Ruth F.		02332	00026	C.3.1.2	--	--	--
			02363	00001	C.2.6.1	--	--	--
			02363	00002	C.3.4.4	--	--	--
			02363	00003	C.3.3	--	--	--
			02363	00006	C.3.3	--	--	--
			02363	00007	C.3.3	--	--	--
			02363	00009	C.2.5.2	--	--	--
			02363	00010	C.3.1.2	--	--	--
			02363	00011	C.3.1.2	--	--	--
			02363	00012	C.2.7.1	--	--	--
			02363	00021	C.3.1.2	--	--	--
			02363	00048	C.3.4.3	--	--	--
	Weis, Deborah S.		02434	00001	C.3.4.4	--	--	--
	Welinski, C. J.		00447	00001	C.3.4.4	--	--	--
			00447	00002	C.3.1.2	--	--	--
	Wending, F. E.		01206	00001	C.3.4.4	--	--	--
	Wheeler, Catherine A.		00099	00002	C.3.1.2	--	--	--
	Wheeler, Catherine A.		00162	00002	C.3.7.3	--	--	--
			00162	00003	C.2.5.2	--	--	--
			00162	00004	C.2.8.2	--	--	--
			00162	00005	C.2.8.2	--	--	--
			00162	00006	C.2.3.1	--	--	--
	Whitbeck, R.O.N.	Christian Commun. Consultants	01532	00001	C.3.4.4	--	--	--
	Whitbeck, R.O.N.	Christian Commun. Consultants	02083	00001	C.3.4.4	--	--	--
	White, Margaret S.		00674	00001	C.2.8.2	--	--	--
			00674	00003	C.2.8.2	--	--	--
	Whitson, Paula L.	Spokane Group Sierra Club	02594	00001	C.2.1.3	--	--	--
			02594	00002	C.2.3.3	--	--	--
			02594	00003	C.2.3.1	--	--	--
			02594	00004	C.3.1.2	--	--	--
			02594	00005	C.2.4.2	--	--	--
			02594	00006	C.2.4.1	--	--	--
			02594	00007	C.2.4.1	--	--	--
			02594	00008	C.2.4.1	--	--	--
			02594	00009	C.2.4.1	--	--	--
			02594	00010	C.2.4.1	--	--	--
			02594	00011	C.2.1.1	--	--	--
			02594	00012	C.2.1.1	--	--	--

C.9-246

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
	Wilgress, Laura		02398	00001	C.2.8.2	--	--	--
	Wilkinson, J.R.		00144	00001	C.3.1.2	--	--	--
			00144	00012	C.3.4.2.4	--	--	--
			00144	00013	C.2.3.3	--	--	--
			00144	00014	C.3.4.4	--	--	--
			00144	00015	C.3.4.4	--	--	--
			00144	00016	C.3.4.4	--	--	--
			00144	00017	C.2.8.1	--	--	--
			00144	00018	C.2.8.1	--	--	--
	Wilkinson, James R.		02520	00001	C.3.1.2	--	--	--
			02520	00004	C.3.1.2	--	--	--
	Wilkinson, James R.		02584	00001	C.3.1.2	--	--	--
			02584	00012	C.3.4.2.4	--	--	--
			02584	00013	C.2.3.3	--	--	--
			02584	00014	C.2.3	--	--	--
			02584	00015	C.3.4.4	--	--	--
			02584	00016	C.3.4.4	--	--	--
			02584	00017	C.2.8.1	--	--	--
	Williams, Agatha		00683	00001	C.2.3.3	--	--	--
			00683	00002	C.2.3.1	--	--	--
			00683	00003	C.3.1.2	--	--	--
			00683	00007	C.3.1.2	--	--	--
	Williams, Thomas		01198	00001	C.2.3.3	--	--	--
			01198	00002	C.2.3	--	--	--
			01198	00003	C.2.3	--	--	--
			01198	00007	C.3.4.4	--	--	--
	Williams, Senator Al		02314	00001	C.2.1.1	--	--	--
			02314	00002	C.3.3	--	--	--
			02314	00003	C.3.4.3	--	--	--
			02314	00004	C.3.4.3	--	--	--
			02314	00005	C.3.4.3	--	--	--
			02314	00006	C.3.4.3	--	--	--
	Williams, Al	ECO Northwest	02361	00001	C.3.4.3	--	--	--
			02361	00002	C.3.4.3	--	--	--
			02361	00003	C.3.4.3	--	--	--
			02361	00004	C.3.4.3	--	--	--
			02361	00005	C.3.4.3	--	--	--
			02361	00006	C.3.4.3	--	--	--

C.9-267

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
			02361	00007	C.3.4.3	--	--	--
			02361	00008	C.3.4.3	--	--	--
			02361	00009	C.3.4.4	--	--	--
			02361	00010	C.3.1.2	--	--	--
			02361	00011	C.3.4.3	--	--	--
			02361	00012	C.3.1.2	--	--	--
			02361	00013	C.3.1.2	--	--	--
			02361	00014	C.3.1.2	--	--	--
			02361	00015	C.3.1.2	--	--	--
			02361	00016	C.3.4.3	--	--	--
			02361	00017	C.3.1.2	--	--	--
			02361	00018	C.3.1.2	--	--	--
			02361	00020	C.3.4.3	--	--	--
			02361	00021	C.3.4.3	--	--	--
			02361	00022	C.3.4.3	--	--	--
			02361	00023	C.3.4.3	--	--	--
			02361	00024	C.3.4.3	--	--	--
			02361	00025	C.3.4.3	--	--	--
			02361	00026	C.3.4.3	--	--	--
			02361	00027	C.3.4.3	--	--	--
			02361	00028	C.3.4.3	--	--	--
			02361	00029	C.3.4.3	--	--	--
			02361	00030	C.3.4.3	--	--	--
			02361	00031	C.3.4.3	--	--	--
			02361	00032	C.3.4.3	--	--	--
			02361	00033	C.3.4.3	--	--	--
			02361	00034	C.3.4.3	--	--	--
			02361	00035	C.3.4.3	--	--	--
			02361	00036	C.3.4.3	--	--	--
			02361	00037	C.3.4.3	--	--	--
			02361	00039	C.3.4.3	--	--	--
			02361	00040	C.3.4.3	--	--	--
			02361	00041	C.3.4.3	--	--	--
			02361	00042	C.3.4.3	--	--	--
			02361	00043	C.3.4.3	--	--	--
			02361	00044	C.3.4.3	--	--	--
			02361	00045	C.3.4.3	--	--	--
			02361	00046	C.3.4.3	--	--	--

C.9-248

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
Washington (continued)								
			02361	00047	C.3.4.3	--	--	--
			02361	00048	C.3.4.3	--	--	--
			02361	00049	C.3.4.3	--	--	--
			02361	00050	C.3.4.3	--	--	--
			02361	00051	C.3.4.3	--	--	--
			02361	00052	C.3.4.3	--	--	--
			02361	00053	C.3.4.3	--	--	--
			02361	00054	C.3.4.3	--	--	--
			02361	00055	C.3.4.3	--	--	--
			02361	00056	C.3.4.3	--	--	--
			02361	00058	C.3.4.4	--	--	--
			02361	00059	C.3.4.4	--	--	--
	Williams, Senator Al	State of Washington	02360	00001	C.2.1.1	--	--	--
			02360	00002	C.3.4.3	--	--	--
			02360	00003	C.3.4.3	--	--	--
			02360	00004	C.3.1.2	--	--	--
			02360	00005	C.3.4.3	--	--	--
			02360	00006	C.3.4.3	--	--	--
			02360	00007	C.3.1.1	--	--	--
			02360	00008	C.3.4.3	--	--	--
			02360	00009	C.3.4.3	--	--	--
	Williams, Senator Al		02731	00001	C.2.1.2	--	--	--
			02731	00002	C.3.1.2	--	--	--
			02731	00003	C.3.4.3	--	--	--
			02731	00004	C.3.4.3	--	--	--
			02731	00005	C.3.4.3	--	--	--
			02731	00006	C.3.4.3	--	--	--
	Wilson, Callie		02347	00001	C.3.1.2	--	--	--
	Wilusz, Janet		02278	00001	C.3.4.4	--	--	--
	Wolf, Hazel		02376	00001	C.3.1.2	--	--	--
			02376	00002	C.2.3.1	--	--	--
			02376	00003	C.2.1.1	--	--	--
			02376	00004	C.3.1.2	--	--	--
			02376	00005	C.2.3.3	--	--	--
			02376	00006	C.2.4.1	--	--	--
			02376	00007	C.2.8.3	--	--	--
	Wonacott, Steve		02383	00003	C.2.5.2	--	--	--
	Woodhouse, Philip R.		00249	00002	C.2.5.2	--	--	--

C:9-249

INDEX OF COMMENTS ON THE DRAFT ENVIRONMENTAL ASSESSMENT FOR THE YUCCA MOUNTAIN SITE

STATE	NAME	ORGANIZATION	LETTER NUMBER	COMMENT NUMBER	CLASSIFICATION			
					FIRST	SECOND	THIRD	FOURTH
<u>Washington (continued)</u>								
	Woods, Carole		02389	00001	C.2.5.2	--	--	--
			02389	00002	C.2.3.1	--	--	--
	Worby, Bernard H.		00204	00001	C.7.3	--	--	--
			00204	00002	C.3.1.2	--	--	--
			00204	00003	C.2.1.1	--	--	--
			00204	00004	C.3.1.2	--	--	--
	Young, John R.		00268	00001	C.3.1.2	--	--	--
			00268	00003	C.3.1.2	--	--	--
			00268	00004	C.3.1.2	--	--	--
	Zepeda, Barbara		02411	00001	C.2.3.1	--	--	--
	Ziegler, Nick J.		00163	00001	C.3.1.2	--	--	--
			00163	00002	C.3.1.2	--	--	--
			00163	00003	C.2.1.1	--	--	--
	Zucker, Dr. Frank		02390	00001	C.2.5.2	--	--	--
<u>Wyoming</u>								
	Ankersmit/Jobson, Karen/Mark		02666	00001	C.3.1.2	--	--	--
			02666	00002	C.3.4.4	--	--	--
	Barmore, Jr., William J.		00064	00001	C.3.4.4	--	--	--
	Carlman, Leonard R.		00524	00003	C.2.1.1	--	--	--
			00524	00004	C.3.1.2	--	--	--
	Franklin, Dr. Chuck		02665	00001	C.3.4.4	--	--	--
	Gaymer/Webb, Jean Alden/William		02663	00001	C.3.4.4	--	--	--
	Rose, Judy A.		02664	00001	C.3.4.4	--	--	--
	Anonymous		01152	00001	C.3.4.4	--	--	--
	Knorr, Michele		00608	00001	C.3.4.4	--	--	--
			00608	00002	C.3.4.4	--	--	--