



Department of Energy

Washington, DC 20585

MAY 20 1994

Mr. Joseph J. Holonich, Director
Repository Licensing & Quality Assurance
Project Directorate
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Holonich:

This letter transmits the Office of Civilian Radioactive Waste Management Yucca Mountain Site Characterization Office Monthly Study Plan Status Report for the month of April 1994. This report summarizes review and approval status of Site Characterization Plan study plans for the Yucca Mountain Site Characterization Office. This summary includes the major accomplishments in the process of developing study plans for the month of April 1994, and the status of all study plans that are currently planned or in review at the Yucca Mountain Site Characterization Office, the Office of Civilian Radioactive Waste Management, and the U.S. Nuclear Regulatory Commission.

If you have any questions, please contact Ms. Sheila Long at 202-586-1447.

Sincerely,

Dwight E. Shelor
Associate Director for
Systems and Compliance
Office of Civilian Radioactive
Waste Management

Enclosure:
Status Report for Study
Plans, April 1994

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WM-11
NH03
102.8

cc: w\enclosure
R. Nelson, YMPO
R. Loux, State of Nevada
T. Hickey, Nevada Legislative Commission
D. Bechtel, Las Vegas, NV
Eureka County, NV
Lander County, Battle Mountain, NV
P. Niedzielski-Eichner, Nye County, NV
W. Offutt, Nye County, NV
L. Bradshaw, Nye County, NV
C. Schank, Churchill County, NV
F. Mariani, White Pine County, NV
V. Poe, Mineral County, NV
J. Pitts, Lincoln County, NV
J. Hayes, Esmeralda County, NV
B. Mettam, Inyo County, CA
M. Delligatti, NRC

**MONTHLY STUDY PLAN STATUS
FOR APRIL 1994**

1.0 INTRODUCTION

The following report summarizes the status of review and approval of Site Characterization Plan (SCP) study plans for the Yucca Mountain Project. Table 1 provides a summary status of all study plans that are currently planned or in review at the Yucca Mountain Site Characterization Project Office (YMSCO), the Office of Civilian Radioactive Waste Management (OCRWM), and the U.S. Nuclear Regulatory Commission (NRC).

Section 2 of this report provides the major accomplishments in the process of developing study plans for the month of April 1994. Section 3 summarizes the status of all study plans in the review process at the Project Office. Section 4 summarizes the status of study plan reviews that have been completed by the NRC and the State of Nevada.

STATUS: END OF APRIL 94	Initial Plans	Major Revisions
Not Submitted to YMSCO	33	
In Screening Review	0	1
In Project Office Review	2	3
Awaiting Comment Resolution	4	2
In Verification Audit	6	1
Awaiting YMSCO Approval	1	0
Awaiting Submission to the NRC	0	1
Awaiting NRC Initial Review	8	5
Accepted by the NRC_	50	6
Totals_	104	18
Total Submitted to the NRC	58	11
Received Comments from the State of Nevada	32	N/A
Response Transmitted to the State of Nevada	24	N/A
Received Comments from the NRC	31	N/A
Responses Transmitted from DOE to the NRC	25	N/A

2.0 STUDY PLAN HIGHLIGHTS FOR THE MONTH OF APRIL, 1994

2.1 NEW STUDY PLAN SUBMITTALS

One new Study Plan, 8.3.4.2.4.5 Characterization of the Effects of Man-Made Materials on Chemical and Mineralogical Changes in the Post-Emplacement Environment, and two major revisions of Study Plans, 8.3.1.2.2.4 R3 Characterization of the Yucca Mountain Unsaturated Zone in the ESF (Activity 2 Percolation Tests) and 8.3.1.17.3.3 R1 Ground Motion from Regional Earthquakes and UNE's (Activity 1 Regional Earthquakes), were submitted to YMSCO in April.

2.2 REVIEW COMMENTS COMPLETED

One Study Plan, 8.3.1.17.3.3 Ground Motion from Regional Earthquakes and UNE's, completed the initial YMSCO technical review in April.

2.3 COMMENT RESOLUTION MEETINGS

No comment resolution meetings were held in April.

2.4 STUDY PLAN REVISIONS

One revision of a Study Plan to resolve reviewer's comments, 8.3.4.2.4.4 Engineered Barrier System Field Tests, was completed in April.

2.5 COMMENT VERIFICATION

Two Study Plans, 8.3.1.3.1.1 Ground-Water Chemistry Model and 8.3.1.15.1.5 R1 Excavation Investigations, completed verification of comment resolution in April.

2.6 STUDY PLANS APPROVALS

One Study Plan, 8.3.1.15.1.5 R1 Excavation Investigations, was approved by YMSCO in April.

2.7 COMPLETED NRC REVIEWS

No Study Plan technical reviews were completed by the NRC in April.

3.0 CURRENT STATUS OF ALL STUDY PLANS

3.1 STUDY PLANS IN REVIEW

The following study plans have not yet completed the screening and technical reviews by YMSCO.

Identification/Organization	Date Draft Transmitted
8.3.1.2.2.4 R3: Characterization of the Yucca Mountain Unsaturated Zone in the ESF/USGS	3/31/94
8.3.1.3.3.2: Kinetics and Thermodynamics of Mineral Evolution/LANL	3/25/94
8.3.1.8.2.1 R1: Tectonic Effects/USGS	2/18/94
8.3.1.17.3.1 R1: Relevant Earthquake Sources/USGS	2/18/94
8.3.1.17.3.3 R1: Ground Motion from Reg Earthquakes/USGS	4/21/94
8.3.4.2.4.5: Effects Man-Made Materials on Post-Emplacement Environment/LLNL	4/28/94

3.2 STUDY PLANS IN REVISION

The following study plans are being revised by the authors in response to comments.

Title/Organization	Comments Transmitted to PI
8.3.1.3.6.1: Dynamic Transport Column Experiments/LANL	6/25/93
8.3.1.5.1.6: Characterization of Future Regional Climates and Environments/SNL	3/30/94
8.3.1.15.1.3 R1: Laboratory Determination of the Mechanical Properties of Intact Rock/SNL	9/23/93
8.3.1.17.3.3: Ground Motion from UNE's/SNL	4/11/94
8.3.1.17.4.1 R1: Current & Historic Seismicity/USGS	2/4/94

**8.3.4.2.4.2: Hydrologic Properties of the Waste-Package
Environment/LLNL**

3/29/94

3.3 STUDY PLANS IN VERIFICATION AUDIT

The following study plans are being audited by reviewers to verify that comments have been satisfactorily responded to.

Identification/Organization	Date Draft Transmitted
8.3.1.2.2.4 R2: Characterization of the Yucca Mountain Unsaturated Zone in the ESF/USGS	10/1/93
8.3.1.3.4.1/8.3.1.3.4.3: Batch Sorption Studies/ Development of Sorption Models/LANL	10/22/93
8.3.1.5.1.1: Characterization of Modern Regional Climate/USGS	1/13/94
8.3.1.15.1.4: Laboratory Determination of the Mechanical Properties of Fractures/SNL	4/20/93
8.3.1.15.2.2: Characterization of Site Ambient Thermal Conditions/USGS	5/19/93
8.3.1.17.4.12: Tectonic Models and Synthesis/USGS	3/2/94
8.3.4.2.4.4: Engineered Barrier System Field Tests/LLNL	4/13/94

3.4 BEING PREPARED FOR YMSCO APPROVAL

8.3.1.3.1.1: Groundwater Chemistry Model/LANL	4/22/94
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3.5 APPROVED STUDY PLANS

8.3.1.15.1.5 R1: Excavation Investigations/SNL	3/22/94
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4.0 STUDY PLANS IN REVIEW AT NRC AND THE STATE OF NEVADA

4.1 NRC ACCEPTANCE REVIEW

The following study plans are in Phase 1 review at the NRC.

Identification/Organization	Transmittal Date
8.3.1.2.2.6 R1: Characterization of Gas-Phase Movement in the Unsaturated Zone/USGS	10/7/93
8.3.1.2.2.8 R1: Fluid Flow in Unsaturated, Fractured Rock/USGS	12/29/93
8.3.1.3.5.1/2: Dissolved Species Concentration Limits and Colloid Behavior/LANL	9/17/93
8.3.1.8.1.2: Physical Processes of Magmatism and Effects on the Potential Repository/LANL	10/4/93
8.3.1.8.5.2: Characterization of Igneous Intrusive Features/USGS	3/18/94
8.3.1.12.2.1 R1: Meteorological Data Collection at the Yucca Mountain Site/SAIC	8/16/93
8.3.1.15.1.1 R1: Laboratory Thermal Properties/SNL	9/14/93
8.3.1.15.1.2 R1: Laboratory Thermal Expansion Testing/SNL	9/14/93
8.3.1.15.1.3: Laboratory Determination of the Mechanical Properties of Intact Rock/SNL	06/21/91
8.3.1.15.1.5: Excavation Investigations/SNL	02/09/89
8.3.1.15.2.1.2: Characterization of Site Ambient Stress Conditions/USGS	02/09/89

4.2 STUDY PLANS ACCEPTED BY THE NRC

The following study plans have been accepted by the NRC.

Identification/Organization	Acceptance Date
8.3.1.2.1.1: Characterization of the Meteorology for Regional Hydrology and Meteorological Monitoring/USGS	10/21/91
8.3.1.2.1.2: Characterization of Run-off and Streamflow/USGS	08/14/92
8.3.1.2.1.3: Characterization of the Regional Ground-Water Flow System/USGS	10/4/91
8.3.1.2.1.4: Regional Hydrologic Synthesis and Modeling/USGS	5/6/92
8.3.1.2.2.1: Characterization of Unsaturated Zone Infiltration/USGS	5/31/91
8.3.1.2.2.2 R1: Water Movement Test/LANL	4/8/93
8.3.1.2.2.3: Characterization of Percolation in the Unsaturated Zone--Surface Based Study/USGS	3/26/92
8.3.1.2.2.4 R1: Characterization of the Yucca Mountain Unsaturated Zone/USGS	3/5/93
8.3.1.2.2.5: Diffusion Tests in the ESF/LANL	1/19/93
8.3.1.2.2.6: Characterization of Gaseous-Phase Movement in the Unsaturated Zone/USGS	10/07/91
8.3.1.2.2.7: Hydrochemical Characterization of the Unsaturated Zone/USGS	05/01/92
8.3.1.2.2.7 R1: Hydrochemical Characterization of the Unsaturated Zone/USGS	1/26/94
8.3.1.2.2.8: Fluid Flow in Unsaturated, Fractured Rock/USGS	1/28/93
8.3.1.2.2.9: Site Unsaturated Zone Synthesis & Modeling/USGS	11/8/93

8.3.1.2.3.1.1-6: Characterization of the Site Saturated Ground-Water Flow System/USGS	12/06/91
8.3.1.2.3.1.7: Testing of the C-Hole Site with Reactive Tracers/LANL	12/06/91
8.3.1.2.3.2: Characterization of the Saturated Zone Hydrochemistry/USGS	1/4/93
8.3.1.2.3.3: Site Saturated Zone Hydrologic Synthesis and Modeling/USGS	6/16/93
8.3.1.3.2.1: Mineralogy, Petrology, and Chemistry of Transport Pathways/LANL	03/13/91
8.3.1.3.2.2: History of Mineralogic and Geochemical Alteration of Yucca Mountain/LANL	04/27/92
8.3.1.3.4.2: Biological Sorption and Transport/LANL	3/25/93
8.3.1.3.6.2: Diffusion/LANL	1/19/94
8.3.1.3.7.1: Retardation Sensitivity Analysis/LANL	1/19/93
8.3.1.4.2.1: Characterization of Vertical and Lateral Distribution of Stratigraphic Units in the Site Area/USGS	12/14/92
8.3.1.4.2.2 R2: Characterization of Structural Features within the Site Area/USGS	2/8/93
8.3.1.4.3.1: Systematic Acquisition of Site-Specific Subsurface Information/SNL	1/11/93
8.3.1.5.1.2: Paleoclimate Study: Lake, Playa, and Marsh Deposits/USGS	04/27/92
8.3.1.5.1.3: Climatic Implications of Terrestrial Paleoecology/USGS	09/03/92
8.3.1.5.1.4: Analysis of the Paleoenvironmental History of the Yucca Mountain Site/USGS	12/06/91

8.3.1.5.2.1: Characterization of the Quaternary Regional Hydrology/USGS	06/08/90
8.3.1.5.2.1.1 R2: Characterization of Quaternary Regional Hydrology/USGS	6/24/93
8.3.1.5.2.2: Characterization of Future Regional Hydrology due to Climate Change/USGS	4/5/93
8.3.1.8.1.1: Probability of Magmatic Disruption of the Repository/LANL	10/5/91
8.3.1.8.2.1: Analysis of Waste Package Rupture due to Tectonic Processes and Events/SAIC	11/19/93
8.3.1.8.5.1: Characterization of Volcanic Features/LANL	08/20/90
8.3.1.9.2.1: Natural Resource Assessment of Yucca Mountain, Nye County/USGS	3/16/93
8.3.1.9.2.2: Water Resource Assessment for Yucca Mountain/SAIC	5/4/92
8.3.1.12.2.1: Meteorological Data Collection at the Yucca Mountain Site/SAIC	11/12/91
8.3.1.14.2: Studies to Provide Soil and Rock Properties of Potential Locations of Surface and Subsurface Facilities/USGS	01/24/92
8.3.1.15.1.8: In Situ Design Verification/SNL	4/15/93
8.3.1.16.1.1: Characterization of Flood Potential of the Yucca Mountain Site/USGS	05/08/91
8.3.1.17.3.1: Relevant Earthquake Sources/USGS	5/18/92
8.3.1.17.3.4: Effects of Local Site Geology on Surface and Subsurface Ground Motions/USGS	6/8/92
8.3.1.17.3.5: Ground Motion at the Site from Controlling Seismic Events/USGS	11/2/93
8.3.1.17.4.1: Historical and Current Seismicity/USGS	05/14/91

8.3.1.17.4.2: Evaluating the Location and Recency of Faulting Near Prospective Surface Facilities/SNL	03/16/90
8.3.1.17.4.3: Quaternary Faulting within 100 km of Yucca Mountain, including the Walker Lane/USGS	2/9/93
8.3.1.17.4.4: Quaternary Faulting Proximal to the Site within NE Trending Fault Zones/USGS	5/18/93
8.3.1.17.4.5: Detachment Faults at or Proximal to Yucca Mountain/USGS	2/1/93
8.3.1.17.4.6: Quaternary Faulting Within the Site Area/USGS	10/3/91
8.3.1.17.4.10: Geodetic Leveling/USGS	10/4/91
8.3.4.2.4.3: Mechanical Properties of the Waste Package Environment/LLNL	4/21/93

4.3 COMMENTS ON APPROVED STUDY PLANS

The following approved study plans have been the subject of written comments by the NRC and the State of Nevada. The status of the responses to these comments is given below.

Study Plan	Source & No. of Comments		Status
8.3.1.2.1.1: Characterization of the Meteorology for Regional Hydrology and Meteorological Monitoring	NV	10	Response sent 7/13/92
8.3.1.2.1.2: Regional Surface Water Run-Off and Streamflow	NV	7	Response sent 8/20/91
	NRC	2	Response sent 11/05/92
8.3.1.2.1.3 Regional Groundwater Flow System	NV	55	Response sent 9/22/93
8.3.1.2.1.4: Regional Hydrologic System Synthesis and Modeling	NRC	1	Response sent 7/23/92
	NRC	5	Response sent 8/30/93
	NV	18	Response sent 4/2/93
8.3.1.2.2.5: Diffusion Tests in the Exploratory Studies Facility	NV	12	In Preparation
8.3.1.2.2.6: Characterization of Gas Phase Movement in the Unsaturated Zone	NRC	1	Response sent 7/23/92
	NV	16	Response sent 7/27/92
8.3.1.2.2.7: Hydrochemical Characterization of the Unsaturated Zone	NV	27	Response sent 2/18/93
8.3.1.2.2.8: Fluid Flow in Unsaturated, Fractured Rock	NRC	2	Response sent 5/27/93
8.3.1.2.3.1.1-6: Characterization of the Site Saturated Zone Ground Water Flow System	NRC	2	Response sent 9/14/92
8.3.1.2.3.1.7: Testing of the C-Hole Site with Reactive Tracers	NRC	2	Response sent 9/14/92

Study Plan	Source & No. of Comments		Status
8.3.1.3.2.1: Mineralogy, Petrology and Chemistry Along Transport Pathways	NRC NV	6 12	Response sent 10/29/91 Response sent 2/24/93
8.3.1.3.2.2: History of Min and Chem Alt of Yucca Mtn	NV	25	In Preparation
8.3.1.3.6.2: Diffusion	NRC	1	In Preparation
8.3.1.4.2.1: Characterization of Vertical and Lateral Distribution of Stratigraphic Units within the Site Area	NRC NRC	3 2	Response sent 3/22/93 Response sent 9/3/93
8.3.1.4.2.2: Characterization of Structural Features at the Site	NV	33	In Preparation
8.3.1.5.1.2: Paleoclim Study: Lake, Playa, Marsh Deposits	NV	17	In Preparation
8.3.1.5.1.3: Climatic Implication Terrest Paleoecology	NV	18	In Preparation
8.3.1.5.1.4: Analysis of the Paleoenvironmental History of the Yucca Mountain Site	NRC NV	1 9	Response sent 9/16/92 Response sent 4/5/94
8.3.1.5.2.1: Quaternary Regional Hydrology	NRC NV	9 10	Response sent 12/19/90 Response sent 9/19/91
8.3.1.5.2.1: Quaternary Regional Hydrology R2	NRC NV	3 7	Response sent 12/27/93 Response sent 4/5/94
8.3.1.5.2.2: Characterization of Future Regional Hydrology	NV	12	Response sent 4/5/94
8.3.1.8.1.1: Probability of Volcanic Eruption Penetrating the Repository	NV NRC	9 13	Response sent 7/19/92 Response sent 3/9/93
8.3.1.8.2.1: Analysis Waste Package Rupture Due to Tectonic Events	NRC	9	In Preparation

Study Plan	Source & No. of Comments	Status
8.3.1.8.5.1: Characterization of Volcanic Features	NV 5 NRC 3	Response sent 8/23/91 Response sent 7/24/91
8.3.1.9.2.1: Natural Resouce Assessment of Yucca Mountain	NRC 8 NV 34	In Preparation In Preparation
8.3.1.9.2.2: Water Resource Assessment of Yucca Mountain	NRC 1 NV 24	Response sent 6/29/92 Response sent 4/22/93
8.3.1.12.2.1: Meteorological Data Collection at the Yucca Mountain Site	NV 5	Response sent 2/13/92
8.3.1.14.2: Studies to Provide Soil and Rock Properties for Potential Locations of Surface Facilities	NRC 1 NV 10	Response sent 8/31/92 Response sent 8/21/92
8.3.1.15.1.8: In-Situ Design Verification	NV 3	Response sent 4/5/94
8.3.1.16.1.1: Characterization of Flood Potential	NV 9 NRC 1	Response sent 6/6/91 Telecon resolution 6/17/91
8.3.1.17.3.1: Relevant Earthquake Sources	NRC 1 NV 32	Response sent 8/15/92 Response sent 4/21/93
8.3.1.17.3.4: Effect of Local Site Geology on Surface and Subsurface Motion	NRC 1 NV 25	Response sent 9/4/92 Response sent 4/27/93
8.3.1.17.3.5: Grd Motion at the Site from Controlling Seismic Events	NRC 1	In Preparation
8.3.1.17.4.1: Historic and Current Seismicity	NRC 3 NV 3	Telecon resolution 8/15/91 Response sent 4/5/94
8.3.1.17.4.2: Location and Recency of Faulting Near Prospective Surface Facilities	NRC 16 NV 3	Response sent 12/19/90 Response sent 10/15/90

Study Plan	Source & No. of Comments	Status
8.3.1.17.4.3: Quaternary Faulting within 100 Km of Yucca Mtn	NRC 3 NV 26	In Preparation In Preparation
8.3.1.17.4.4: Quaternary Faulting within NE-Trending Zones	NRC 3	In Preparation
8.3.1.17.4.5: Detach Faults At or Proximal to Yucca Mountain	NV 68	In Preparation
8.3.1.17.4.6: Quaternary Faulting	NRC 1 NV 14	Response sent 12/16/91 Response sent 3/8/93
8.3.1.17.4.10: Geodetic Leveling	NV 16 NRC 2	Response sent 4/9/93 Response sent 9/21/93
8.3.4.2.4.3: Characterization of the Geomechanical Attributes of the Waste Package Environment	NRC 3	Response sent 9/3/93

LEGEND FOR TABLE 1

Submit to YMSCO	Actual date of the submission of the draft study plan.
Screening Review Complete	Date that screening review was recieved by the YMSCO. Screening reviews were not done for some study plans submitted early in the process. These are indicated by the word "None". Revs. 2 & 3 of AP-1.10Q did not require a screening review. Plans reviewed under Rev. 2 & 3 are indicated by "NA".
Comments to PI	Date that review comments were transmitted to the Principal Investigator for review.
PI Revision Complete	Date that revised study plan that responds to YMSCO and Headquarters comments is submitted to the YMSCO.
Verify Comm. Res.	Date that the verification of actual dispositions of comments is completed by reviewers.
YMSCO Approve	Date that YMSCO approves the plan.
Submit To NRC	The date that the study plan is submitted to the NRC for review.
NRC Initial Review	Date that NRC Acceptance and Start-Work Reviews are completed.
NRC Detailed Review	Date that NRC Detailed Technical Reviews are completed or note that none will be completed or the review will be deferred.
NV Review	Date that the State of Nevada Technical Reviews are completed.

#	SP NAMES/CODE	SP	SUBMIT	SCREENING	COMMENTS	PI	VERIFY	YMSCO	SUBMIT	NRC	NRC	NV
		NUMBER	TO	REVIEW	TO PI	REVISION	COMMENT	APPROVE	TO NRC	INITIAL	DETAILED	REVIEW
	NRC & NV COMMENTS TABULATED IN SECTION 4.3		YMSCO	COMPLETE		COMPLETE	RESOL			REVIEW	REVIEW	
1	CHAR OF MET FOR REG HYDRO/USGS	8.3.1.2.1.1	6/26/90	6/27/90	10/1/90	11/9/90	2/25/91	3/13/91	6/21/91	10/21/91	NONE	12/10/91
2	CHAR RUNOFF AND STREAMFLOW/USGS	8.3.1.2.1.2	3/27/89	NA	10/17/89	3/22/90	7/17/90	8/21/90	10/4/90	5/14/91	8/14/92	4/12/91
3	CHAR OF REG GRD W FLOW SYSTEM/USGS	8.3.1.2.1.3	3/1/90	3/14/90	7/3/90	9/17/90	10/19/90	1/18/91	2/15/91	10/4/91	NONE	3/19/93
4	REG HYDRO SYS SYN AND MODELING/USGS	8.3.1.2.1.4	6/6/90	6/29/90	3/14/91	5/8/91	10/2/91	12/18/91	1/15/92	5/6/92	4/6/93	1/29/93
5	CHAR UNSAT ZONE INFILTRATION/USGS	8.3.1.2.2.1	3/9/90	3/14/90	7/3/90	9/17/90	10/15/90	1/18/91	3/1/91	5/31/91	NONE	
6	WATER MOVEMENT TEST/LANL, REV O	8.3.1.2.2.2	9/23/87	N/A	COMPLETE	10/30/87	1/9/89	11/9/89	2/9/89	4/8/93		
6 R1	WATER MOVEMENT TEST/LANL, REV I	8.3.1.2.2.2	10/17/91	N/A	5/12/92	12/10/92	2/4/93	2/10/93	2/19/93	4/8/93	DEFERRED	
7	CHAR PERCOL IN UZ-SURFACE BASED STUDY/USGS	8.3.1.2.2.3	8/12/88	NA	1/23/89	2/20/90	1/9/91	04/08/91	5/10/91	3/26/92		
8	CHAR YUC MTN PERCO UNSAT ZONE-ESF/USGS (4,5,7,8,9)	8.3.1.2.2.4	9/9/87	NA	12/7/88	1/4/89	1/9/89	1/09/89	2/9/89	3/5/93		
8 R1	CHAR YUC MTN UNSAT ZONE-ESF/USGS (4,5,7,8)	8.3.1.2.2.4	12/4/92	12/9/92	12/11/92	12/19/92	1/5/93	1/14/93	1/21/93	3/5/93		
8 R2	CHAR YUC MTN UNSAT ZONE-ESF INVEST/USGS (.10)	8.3.1.2.2.4	3/16/93	3/24/93	5/12/93	10/1/93						
8 R3	CHAR YUC MYN UNSAT ZONE-ESF INVEST/USGS (.1,2)	8.3.1.2.2.4	4/29/94	5/6/94								
9	DIFFUSION TESTS IN ESF/LANL	8.3.1.2.2.5	11/1/88	11/18/88	2/28/90	6/11/91	1/24/92	4/22/92	6/8/92	1/19/93	DEFERRED	11/1/93
10	CHAR GAS-PHASE MOVEMENT IN UZ/USGS	8.3.1.2.2.6	6/12/89	7/14/89	3/9/90	5/24/90	04/03/91	6/11/91	6/24/91	10/07/91	NONE	5/1/92
10 R1	CHAR GAS-PHASE MOVEMENT IN UZ/USGS	8.3.1.2.2.6	4/6/93	4/20/93	6/8/93	8/27/93	9/21/93	9/30/93	10/7/93			
11	HYDROCHEM CHAR OF UZ/USGS	8.3.1.2.2.7	10/24/88	11/4/88	3/8/89	6/27/89	4/10/90	9/18/90	5/8/91	5/1/92	DEFERRED	12/28/92
11 R1	HYDROCHEM CHAR OF UZ/USGS	8.3.1.2.2.7	12/1/92	12/2/92	2/8/93	3/31/93	6/30/93	9/9/93	9/17/93	1/26/94		
12	FLUID FLOW IN UNSAT, FRAC ROCK/USGS	8.3.1.2.2.8	9/7/90	10/3/90	5/01/91	11/26/91	5/28/92	8/12/92	9/1/92	1/28/93	DEFERRED	
12 R1	FLUID FLOW IN UNSAT, FRAC ROCK/USGS	8.3.1.2.2.8	12/1/92	12/2/92	2/8/93	10/1/93	11/29/93	12/17/93	12/29/93			
13	SITE UZ MODELING & SYNTHESIS/USGS	8.3.1.2.2.9	1/25/91	NA	2/27/92	4/19/93	6/14/93	7/1/93	7/14/93	11/8/93	DEFERRED	
14	CHAR SITE SAT ZONE GRD W FLOW SYS/LANL (.7)	8.3.1.2.3.1	2/8/88	NA	7/15/89	11/16/89	1/-/90	2/22/90	4/6/90	12/6/91	DEFERRED	
15	CHAR SITE SAT ZONE GRD W FLOW SYS/USGS (1-6)	8.3.1.2.3.1	5/31/89	6/15/89	11/1/89	5/18/90	10/15/90	2/13/91	3/7/91	12/6/91	DEFERRED	
14 R1	CHAR SITE SAT ZONE GRD W FLOW SYS/LANL (.8)											
16	CHAR SAT ZONE HYDROCHEM/USGS	8.3.1.2.3.2	3/28/90	5/9/90	11/27/90	11/27/91	3/11/92	4/22/92	6/5/92	1/4/93	NONE	
17	SAT ZONE HYDRO SYSTEM SYNTH AND MODELING/USGS	8.3.1.2.3.3	9/4/90	10/12/90	8/30/91	3/31/92	10/19/92	1/14/93	1/28/93	6/16/93	DEFERRED	
18	GROUND-WATER CHEMISTRY MODEL/LANL	8.3.1.3.1.1	3/15/91	NA	5/6/92	11/8/93	4/22/94	5/4/94				
19	MIN, PET, CHEM OF TRANSPORT PATHWAYS/LANL	8.3.1.3.2.1	1/22/88	5/24/88	7/13/88	12/23/88	9/12/89	6/13/89	11/30/89	8/20/90	3/13/91	12/28/92
20	HIST OF MIN AND GEOCHEM ALT OF YUCCA MTN/LANL	8.3.1.3.2.2	3/28/88	NA	5/25/89	6/13/91	9/23/91	12/18/91	1/31/92	4/27/92	DEFERRED	1/24/94
21	NAT ANLOG HYDROTHERM SYS IN TUFF/LLNL	8.3.1.3.3.1										
22	KINETICS AND THERMODYN OF MIN EVOL/LANL	8.3.1.3.3.2	3/25/94	3/30/94								
23	CONCEPTUAL MODEL OF MINERAL EVOL/LANL	8.3.1.3.3.3										
24	BATCH SORPT STUDIES AND DEVEL SORPT MODELS/LANL	8.3.1.3.4.1/3	10/28/92	11/4/92	2/18/93	10/22/93						
25	BIOLOGICAL SORPTION & TRANSPORT/LANL	8.3.1.3.4.2	12/12/88	1/5/89	3/12/90	8/28/91	12/7/91	11/25/92	12/24/92	3/25/93	DEFERRED	
26	DISSOLVED SPECIES CONC LIMITS AND COLLOID BEH/LANL	8.3.1.3.5.1/2	9/7/90	NA	11/8/91	10/21/92	8/6/93	9/9/93	9/17/93			
27	DYNAMIC TRANSPORT COLUMN EXPERIMENTS/LANL	8.3.1.3.6.1	3/10/93	3/22/93	6/25/93							
28	DIFFUSION/LANL	8.3.1.3.6.2	7/24/89	8/9/89	5/10/90	12/4/92	6/28/93	8/6/93	8/12/93	1/19/94	1/19/94	
29	RETARDATION SENSITIVITY ANALYSIS/LANL	8.3.1.3.7.1	12/14/88	2/8/89	3/12/90	6/18/91	7/28/92	8/11/92	9/1/92	1/19/93	NONE	

#	SP NAMES/CODE	SP	SUBMIT	SCREENING	COMMENTS	PI	VERIFY	YMSCO	SUBMIT	NRC	NRC	NV
		NUMBER	TO	REVIEW	TO PI	REVISION	COMMENT	APPROVE	TO NRC	INITIAL	DETAILED	REVIEW
	NRC & NV COMMENTS TABULATED IN SECTION 4.3		YMSCO	COMPLETE		COMPLETE	RESOL			REVIEW	REVIEW	
30	DEMON APPLI LAB DATA TO REPOS TRANS CALC/LANL	8.3.1.3.7.2										
31	GASEOUS RAD TRANS CALCS AND MEASURE/LANL	8.3.1.3.8.1										
32	CHAR VERT/LAT DIST STRAT UNITS SITE AREA/USGS	8.3.1.4.2.1	4/12/90	5/10/90	2/8/91	2/3/92	4/30/92	6/9/92	6/22/92	12/14/92	DEFERRED	
33	CHAR STRUCTURAL FEATURES W/IN SITE AREA/USGS	8.3.1.4.2.2	9/4/87	NA	Done	4/13/88	2/3/89	2/03/89	2/9/89	2/8/93		
33 R1	2 MORE ACTIVITIES (3,5)/USGS	8.3.1.4.2.2	2/27/90	3/22/90	8/21/90	7/29/91	2/10/92	4/22/92	6/15/92	2/8/93		
33 R2	CHAR STRUCTURAL FEATURES W/IN SITE AREA/USGS	8.3.1.4.2.2	11/18/92	11/19/92	12/1/92	12/14/92	12/18/92	12/22/92	1/6/93	2/8/93	DEFERRED	2/11/94
34	THREE-DIMENSIONAL GEOLOGIC MODEL/USGS	8.3.1.4.2.3										
35	SYST ACQ SITE-SPEC SUBSURF INFO/SNL	8.3.1.4.3.1	3/27/90	4/13/90	10/2/90	7/28/92	9/4/92	12/8/92	1/11/93	7/19/93		
36	THREE-DIMENSIONAL ROCK CHAR MODELS/SNL	8.3.1.4.3.2	5/4/94									
37	CHAR MODERN REGIONAL CLIMATE/USGS	8.3.1.5.1.1	6/24/93	6/25/93	8/30/93	1/13/94						
38	PALEOCLIM STUDY: LAKE, PLAYA, MARSH DEPS/USGS	8.3.1.5.1.2	10/25/90	NA	3/27/91	5/9/91	10/25/91	10/31/91	12/6/91	4/27/92	DEFERRED	1/24/94
39	CLIMATIC IMPLICATION TERREST PALEOECOLOGY/USGS	8.3.1.5.1.3	2/11/91	NA	6/25/91	DONE	12/11/91	1/17/92	6/5/92	8/27/92		1/24/94
40	ANALYSIS PALEOENVI HIST YUCCA MTN REGION/USGS	8.3.1.5.1.4	3/30/90	4/13/90	8/13/90	10/24/90	1/9/91	5/29/91	6/24/91	12/06/91	DEFERRED	1/11/93
41	PALEOCLIM-PALEOENVIRO SYNTHESIS/USGS	8.3.1.5.1.5										
42	CHAR FUTURE REG CLIMATES AND ENVIRONS/SNL	8.3.1.5.1.6	12/29/93	1/7/94	3/30/94	5/9/94						
43	CHAR OF THE QUATERNARY REG HYDRO/USGS (3,4,5)	8.3.1.5.2.1	1/26/88	NA	12/9/88	5/15/89	6/8/89	6/08/89	7/10/89	11/24/89	6/8/90	4/9/91
43 R2	CHAR OF THE QUATERNARY REG HYDRO/USGS (1)	8.3.1.5.2.1	9/25/90	NA	8/8/91	3/31/92	8/10/92	11/10/92	12/31/92	6/24/93	6/24/93	11/1/93
44	CHAR FUTURE REG HYDRO DUE TO CLI CHANGES/USGS	8.3.1.5.2.2	1/16/91	NA	8/7/91	5/1/92	7/14/92	11/10/92	12/24/92	4/5/93	DEFERRED	11/1/93
45	DISTRIB AND CHAR PRESENT AND PAST EROSION/USGS	8.3.1.6.1.1										
46	INFLU FUT CLI COND ON LOC & RATES OF ERO/USGS	8.3.1.6.2.1										
47	EVAL EFFECT OF FUT TECT ON ERO AT YUC MTN/USGS	8.3.1.6.3.1										
48	DEV TOPICAL RPT EFFECTS OF ERO ON THE HYDRO, GEOCHEM, AND ROCK CHAR AT YUCCA MTN/USGS	8.3.1.6.4.1										
49	PROB MAGMATIC DISRUPTION OF THE REPOS/LANL	8.3.1.8.1.1	3/29/89	4/5/89	9/12/89	6/19/90	9/10/90	9/19/90	3/5/91	10/5/91	7/10/92	8/8/91
50	PHYSICAL PROCESSES OF MAGMATISM AND EFFECTS/LANL	8.3.1.8.1.2	10/21/92	10/26/92	1/14/93	6/2/93	8/30/93	9/21/93	10/4/93			
51	ANAL WST PKG RUP DUE TO TECT PROC & EVENT/USGS	8.3.1.8.2.1	12/15/89	1/31/90	10/30/90	12/10/91	8/11/92	11/16/92	12/23/92	11/19/93		
51 R1	TECTONIC EFFECTS/USGS	8.3.1.8.2.1	2/18/94	2/23/94								
52	ANAL EFFECTS OF TECT PROC & EVENT ON AVE PERC FLUX RATES OVER REPOS/USGS	8.3.1.8.3.1										
53	ANAL EFF OF TECT PROC&EVENT CHGS WTR TBLE ELV/USGS	8.3.1.8.3.2										
54	ANAL EFF OF TECT PROC & EVENT ON LOCAL FRAC PERM AND EFFECTIVE POROSITY/USGS	8.3.1.8.3.3										
55	ANAL EFF TECT PROC&EVENT ON RK GEOCHEM PROP/USGS	8.3.1.8.4.1										
56	CHAR OF VOLCANIC FEATURES/LANL	8.3.1.8.5.1	12/14/88	1/17/89	6/20/89	1/2/90	3/15/90	4/18/90	5/15/90	8/20/90	3/18/91	2/21/91
57	CHAR IGNEOUS INTRUSIVE FEATURES/USGS	8.3.1.8.5.2	10/13/92	10/16/92	2/19/93	5/19/93	1/28/94	3/7/94	3/18/94			
58	INVEST FOLDS IN MIOCENE AND YNG RKS OF REG/USGS	8.3.1.8.5.3										
59	EVAL NAT PROC THAT COULD AFFECT LG TERM SURVIVABIL SURFACE MARKER SYS AT YUCCA MTN/M&O	8.3.1.9.1.1										

#	SP NAMES/CODE	SP	SUBMIT	SCREENING	COMMENTS	PI	VERIFY	YMSCO	SUBMIT	NRC	NRC	NV
		NUMBER	TO	REVIEW	TO PI	REVISION	COMMENT	APPROVE	TO NRC	INITIAL	DETAILED	REVIEW
	NRC & NV COMMENTS TABULATED IN SECTION 4.3		YMSCO	COMPLETE		COMPLETE	RESOL			REVIEW	REVIEW	
60	NAT RES ASSESS YUCCA MTN, NYE COUNTY/USGS	8.3.1.9.2.1	7/13/90	8/16/90	1/7/91	1/13/92	9/28/92	11/6/92	12/17/92	3/16/93	2/18/94	2/11/94
61	WATER RES ASSESS YUCCA MTN, NV/SAIC	8.3.1.9.2.2	10/6/89	1/30/90	8/15/90	12/26/90	6/13/91	8/26/91	9/20/91	5/4/92		12/28/92
62	EVAL DATA NEEDED TO SUPP ASSESS LIKLIHOOD FUT INADVER HUMAN INTRU YUC MTN EXPLO/EXT NAT RES/M&O	8.3.1.9.3.1										
63	EVAL POTENTIAL EFFECT OF EXPLOIT NAT RES ON HYDRO CHAR AT YUCCA MTN/M&O	8.3.1.9.3.2										
64	METEOROLOGICAL DATA COLLECT YUCCA MTN SITE/SAIC	8.3.1.12.2.1	9/28/90	NA	2/4/91	2/21/91	2/26/91	3/20/91	5/16/91	11/12/91	NONE	12/2/91
64 R1	METEOROLOGICAL DATA COLLECT YUCCA MTN SITE/SAIC, REV 1	8.3.1.12.2.1	3/31/92	4/21/92	6/17/92	12/2/92	7/29/93	8/9/93	8/16/93			
65	STUDIES TO PROVIDE SOIL/ROCK PROP OF POTENTIAL LOCATIONS OF SURFACE/SUBSURFACE FACILITIES/SNL	8.3.1.14.2	7/15/91	7/23/91	8/11/91	8/21/91	9/22/91	10/01/91	10/16/91	1/24/92		4/6/92
66	LAB THERMAL PROPERTIES/SNL	8.3.1.15.1.1	3/17/88	NA	11/1/89	3/16/90	5/23/90	10/21/90	1/25/91	DEFERRED		
66 R1	LAB THERMAL PROPERTIES/SNL	8.3.1.15.1.1	11/3/92	11/9/92	12/10/92	4/8/93	8/3/93	8/27/93	9/14/93			
67	LAB THERMAL EXPANSION TESTING/SNL	8.3.1.15.1.2	12/1/88	12/20/88	Done	11/20/89	5/23/90	8/21/90	10/4/90	DEFERRED		
67 R1	LAB THERMAL EXPANSION TESTING/SNL	8.3.1.15.1.2	11/3/92	11/9/92	2/3/93	4/8/93	8/3/93	8/27/93	9/14/93			
68	LAB DETERMIN MECH PROP INTACT ROCK/SNL	8.3.1.15.1.3	2/8/88	NA	7/6/88	11/29/88		5/21/91	6/21/91	DEFERRED		
68 R1	LAB DETERMIN MECH PROP INTACT ROCK/SNL	8.3.1.15.1.3	7/19/93	7/23/93	9/23/93							
69	LAB DETERMIN MECH PROP FRACTURES/SNL	8.3.1.15.1.4	10/23/91	2/5/92	5/12/92	4/20/93						
70	EXCAVATION INVESTIGATIONS/SNL	8.3.1.15.1.5	3/26/87	NA	Done	9/1/87	5/27/88	1/09/89	2/9/89	DEFERRED		
70 R1	EXCAVATION INVESTIGATIONS/SNL	8.3.1.15.1.5	3/18/93	3/24/93	5/10/93	3/4/94	4/11/94	4/22/94	5/5/94			
71	IN SITU THERMOMECH PROP/SNL	8.3.1.15.1.6										
72	IN SITU MECHANICAL PROP/SNL	8.3.1.15.1.7										
73	IN SITU DESIGN VERIFICATION/SNL	8.3.1.15.1.8	3/20/90	4/12/90	10/10/91	11/23/92	1/12/93	2/3/93	2/8/93	4/15/93	NONE	11/1/93
74	CHAR SITE AMBIENT STRESS CONDITIONS/USGS (2)	8.3.1.15.2.1	9/22/87	NA	Done	2/23/88	2/9/89	1/11/89	2/9/89	DEFERRED		
74 R1	CHAR SITE AMBIENT STRESS CONDITIONS/SNL (1)	8.3.1.15.2.1										
75	CHAR SITE AMBIENT THERMAL COND/USGS	8.3.1.15.2.2	10/13/92	10/16/92	2/19/93	5/19/93						
76	CHAR OF FLOOD POTENTIAL YUCCA MTN SITE/USGS	8.3.1.16.1.1	3/30/89	5/2/89	10/13/89	4/27/90	8/6/90	9/17/90	10/11/90	5/8/91	NONE	1/22/91
77	LOC OF ADEQ WATER SUPPLY CONST OPER, CLOS, DECOMM OF A MGDS AT YUCCA MTN/SAIC	8.3.1.16.2.1										
78	DETERMINE PRECLOS HYDRO COND UZ YUCCA MTN/USGS	8.3.1.16.3.1										
79	POTENTIAL FOR ASH FALL AT SITE/LANL	8.3.1.17.1.1										
80	FAULTING POTENTIAL AT REPOSITORY/USGS	8.3.1.17.2.1										
81	RELEVANT EARTHQUAKE SOURCES/USGS	8.3.1.17.3.1	8/1/90	8/22/90	12/28/90	5/1/91	11/15/91	12/18/91	1/16/92	5/18/92		1/13/93
81 R1	RELEVANT EARTHQUAKE SOURCES/USGS	8.3.1.17.3.1	2/18/94	2/22/94								
82	UNDERGROUND NUCLEAR EXPLOSION SOURCES/SNL	8.3.1.17.3.2										
83 R1	GRD MOTION FROM REG EARTHQUAKES/USGS	8.3.1.17.3.3.1	4/21/94	4/28/94								
83	GRD MOTION FROM UNEs/SNL	8.3.1.17.3.3.2	2/2/94	2/7/94	4/11/94							
84	EFFECT LOCAL SITE GEOL ON SRF&SUBSRF MOTION/USGS	8.3.1.17.3.4	7/6/90	7/23/90	1/23/91	4/16/91	8/26/91	11/14/91	12/4/91	6/8/92	NONE	1/11/93
85	GRD MOTION AT SITE FROM CONTROL SEIS EVENT/USGS	8.3.1.17.3.5	10/4/90	NA	2/27/92	4/14/92	6/29/93	7/9/93	7/19/93	11/2/93		

#	SP NAMES/CODE	SP	SUBMIT	SCREENING	COMMENTS	PI	VERIFY	YMSCO	SUBMIT	NRC	NRC	NV
		NUMBER	TO	REVIEW	TO PI	REVISION	COMMENT	APPROVE	TO NRC	INITIAL	DETAILED	REVIEW
	NRC & NV COMMENTS TABULATED IN SECTION 4.3		YMSCO	COMPLETE		COMPLETE	RESOL			REVIEW	REVIEW	
86	PROBABILISTIC SEISMIC HAZARD ANALYSES/USGS	8.3.1.17.3.6										
87	HISTORICAL AND CURRENT SEISMICITY/USGS	8.3.1.17.4.1	10/17/89	10/25/89	4/30/90	7/6/90	9/4/90	9/17/90	10/22/90	5/14/91	NONE	11/1/93
87 R1	HISTORICAL AND CURRENT SEISMICITY/USGS	8.3.1.17.4.1	11/16/93	11/19/93	2/4/94							
88	LOC & REGENCY OF FAULT NEAR PROSPEC SUR FACIL/USGS	8.3.1.17.4.2	12/6/88	12/14/88	Done	2/16/89	6/21/89	5/22/89	7/10/89	11/24/89	3/16/90	***
89	QT FLT 100KM YUCCA MTN, INCL WALKER LANE/USGS	8.3.1.17.4.3	3/25/92	4/6/92	6/17/92	9/22/92	12/28/92	1/21/93	2/9/93	9/2/93	9/2/93	3/3/94
90	QUAT FAULT PROXIMAL TO SITE W/IN NE-TREND FAULT ZONES/USGS	8.3.1.17.4.4	8/3/92	8/5/92	9/25/92	10/26/92	2/24/93	3/18/93	5/18/93	9/2/93		
91	DETACH FAULTS AT OR PROX TO YUCCA MTN/USGS	8.3.1.17.4.5	5/1/90	5/9/90	5/21/91	3/25/92	6/9/92	7/20/92	8/12/92	2/1/93	NONE	1/24/94
92	QUAT FAULTING W/IN SITE AREA/USGS	8.3.1.17.4.6	10/14/88	NA	Done	5/25/89	10/11/90	1/23/91	2/19/91	10/3/91	NONE	1/13/93
93	SUBSUR GEOMET AND CONCEALED EXTEN OF QUAT FAULTS AT YUCCA MTN/USGS	8.3.1.17.4.7										
94	STRESS FIELD WITHIN/PROX TO SITE AREA/USGS	8.3.1.17.4.8										
95	TECT GEOMORPH YUCCA MTN REG/USGS	8.3.1.17.4.9										
96	GEODETIC LEVELING/USGS	8.3.1.17.4.10	3/30/90	4/19/90	8/8/90	9/21/90	10/15/90	1/18/91	2/14/91	10/4/91	NONE	2/1/93
97	CHAR REG LATERAL CRUSTAL MOVEMENT/USGS	8.3.1.17.4.11										
98	TECTONIC MODELS AND SYNTHESIS/USGS	8.3.1.17.4.12	4/30/93	5/4/93	7/30/93	3/2/94						
99	SEAL MATERIAL PROPERTIES DEVELOPMENT/SNL	8.3.3.2.2.1										
100	CHAR CHEM AND MIN CHANGES POSTEMPLAC ENVIRO/LLNL	8.3.4.2.4.1										
101	HYDRO PROP OF WASTE PKG ENVIRO/LLNL	8.3.4.2.4.2	12/20/93	12/22/93	3/29/94							
102	MECH ATTRIBUTES OF WASTE PKG ENVIRO/LLNL	8.3.4.2.4.3	6/28/89	7/11/89	3/13/90	9/27/91	11/17/92	12/11/92	12/31/92	4/21/93		
103	ENG BARRIER SYSTEM FIELD TESTS/LLNL	8.3.4.2.4.4	7/9/93	7/14/93	9/10/93	4/13/94						
104	EFFECTS MAN-MADE MATERIALS ON WATER CHEMISTRY/LLNL	8.3.4.2.4.5	4/28/94	4/29/94								