

**MONTHLY STUDY PLAN STATUS
FOR APRIL 1993**

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 (Project Office), 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 1993. 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.

2.0 STUDY PLAN HIGHLIGHTS FOR THE MONTH OF APRIL, 1993

2.1 NEW STUDY PLAN SUBMITTALS

One new study plan, 8.3.1.17.4.12 Tectonic Models and Synthesis, and one revision to an approved study plan, 8.3.1.2.2.6 R1 Characterization of Gas-Phase Movement in the Unsaturated Zone were received by the Project Office in April.

2.2 REVIEW COMMENTS COMPLETED

No Project Office reviews were completed in April.

2.3 COMMENT RESOLUTION MEETINGS

No comment resolution meetings were held in April.

2.4 STUDY PLAN REVISIONS

Four revisions of study plans to resolve reviewers comments were completed in April, 8.3.1.2.2.9 Site Unsaturated Zone Modeling and Synthesis, 8.3.1.15.1.1 R1 Laboratory Thermal Properties, 8.3.1.15.1.2 R1 Laboratory Thermal Expansion Testing and 8.3.1.15.1.4 Laboratory Determination of the Mechanical Properties of Fractures.

2.5 COMMENT VERIFICATION

No Study Plans completed verification of comment resolution in April.

2.6 STUDY PLANS APPROVALS

No new study plans were approved by the Project Office in April.

2.7 COMPLETED NRC REVIEWS

Four study plan phase I reviews, 8.3.1.2.2.2 R1 Water Movement Test, 8.3.1.5.2.2 Characterization of Future Regional Hydrology Due to Climate Changes, 8.3.1.15.1.8 In-Situ Design Verification and 8.3.4.2.4.3 Characterization of the Geomechanical Attributes of the Waste Package Environment, were completed during April. One phase II review, 8.3.1.2.1.4 Regional Hydrologic System Synthesis and Modeling was completed in April.

2.8 REVIEW CYCLE TERMINATED

Six study plans were deleted from the review process because of inactivity, 8.3.1.3.3.2 Kinetics and Thermodynamics of Mineral Evolution, 8.3.1.3.3.3 Conceptual Model of Mineral Evolution, 8.3.1.5.1.6 Characterization of Future Regional Climates and Environments, 8.3.1.17.3.3 Ground Motion from Regional Earthquakes and UNE's, 8.3.4.2.4.1 Characterization of Chemical and Mineralogic Changes in the Postemplacement Environment and 8.3.4.2.4.2 Hydrologic Properties of the Waste Package Environment. In some cases this inactivity has resulted from a lack of funding.

3.0 CURRENT STATUS OF ALL STUDY PLANS

3.1 PLANS IN REVIEW

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

Identification/Organization	Date Draft Transmitted
8.3.1.2.2.4 R2: Characterization of the Yucca Mountain Unsaturated Zone in the ESF/USGS	3/16/93
8.3.1.2.2.6 R1: Characterization of Gas-Phase Movement in the Unsaturated Zone/USGS	4/6/93
8.3.1.3.6.1: Dynamic Transport Column Experiments/LANL	3/10/93
8.3.1.15.1.5 R1: Excavation Investigations/SNL	3/18/93
8.3.1.17.4.12: Tectonic Models and Synthesis/USGS	4/30/93

3.2 STUDY PLANS AWAITING COMMENT RESOLUTION MEETINGS

Comments have been transmitted to the authors, and the Project Office is awaiting notification that the author is ready for a comment resolution meeting or notification that proposed resolutions have been agreed upon between the PI and reviewers without the need for a meeting.

Identification/Organization	Date Comments Sent to PI
None	

3.3 STUDY PLANS IN REVISION

3.3.1 Comment Resolution Meetings have been held, and the following study plans are being revised by the authors in response to comments.

Title/Organization	Comment Resolution Meeting Date
None	

3.3.2 No Comment Resolution meeting is required, and the following study plans are being revised by the authors in response to comments.

Title/Organization	Comments Transmitted to PI
8.3.1.2.2.8 R1: Fluid Flow in Unsaturated, Fractured Rock/USGS	2/8/93
8.3.1.3.1.1: Groundwater Chemistry Model/LANL	5/6/92
8.3.1.3.4.1/8.3.1.3.4.3: Batch Sorption Studies/ Development of Sorption Models/LANL	2/18/93
8.3.1.8.1.2: Physical Processes of Magmatism and Effects on the Potential Repository/LANL	1/14/93
8.3.1.8.5.2: Characterization of Igneous Intrusive Features/USGS	2/19/93
8.3.1.15.2.2: Characterization of Site Ambient Thermal Conditions/USGS	2/19/93

3.4 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
8.3.1.2.2.7 R1: Hydrochemical Characterization of the Unsaturated Zone/USGS	3/31/93
8.3.1.2.2.9: Site Unsaturated Zone Synthesis &	4/19/93
8.3.1.3.5.1/2: Dissolved Species Concentration Limits and Colloid Behavior/LANL	10/21/92
8.3.1.3.6.2: Diffusion/LANL	12/4/92
8.3.1.12.2.1 R1: Meteorological Data Collection at the Yucca Mountain Site/SAIC	12/2/92
8.3.1.15.1.1 R1: Laboratory Thermal Properties/SNL	4/8/93
8.3.1.15.1.2 R1: Laboratory Thermal Expansion Testing/SNL	4/8/93
8.3.1.15.1.4: Laboratory Determination of the Mechanical Properties of Fractures/SNL	4/20/93

3.5 BEING PREPARED FOR PROJECT OFFICE APPROVAL

8.3.1.17.3.5: Ground Motion at the Site from Controlling Seismic Events/USGS	02/10/93
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3.6 APPROVED STUDY PLANS

8.3.1.17.4.4: Quaternary Faulting Proximal to the Site within NE Trending Fault Zones/USGS	2/24/93
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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
8.3.1.2.2.1 R1: Characterization of Unsaturated Zone Infiltration/USGS	06/1/92
8.3.1.2.3.3: Site Saturated Zone Hydrologic Synthesis and Modeling/USGS	1/28/93
8.3.1.4.3.1: Systematic Acquisition of Site-Specific Subsurface Information/SNL	1/11/93
8.3.1.5.2.1.1 R2: Characterization of Quaternary Regional Hydrology/USGS	12/31/92
8.3.1.8.2.1: Analysis of Waste Package Rupture due to Tectonic Processes and Events/SAIC	12/23/92
8.3.1.15.1.1: Laboratory Thermal Properties	01/25/91
8.3.1.15.1.2: Laboratory Thermal Expansion Testing/SNL	10/04/90
8.3.1.15.1.3: Laboratory Determination of the Mechanical Properties of Intact rock	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
8.3.1.17.4.3: Quaternary Faulting within 100 km of Yucca Mountain, including the Walker Lane/USGS	2/9/93

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	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	10/07/91
8.3.1.2.2.7: Hydrochemical Characterization of the Unsaturated Zone/USGS	05/01/92
8.3.1.2.2.8: Fluid Flow in Unsaturated, Fractured Rock	1/28/93
8.3.1.2.3.1.1-6: Characterization of the Site Saturated Ground-Water Flow System	12/06/91
8.3.1.2.3.1.7: Testing of the C-Hole Site with Reactive Tracers	12/06/91

8.3.1.2.3.2: Characterization of the Saturated Zone Hydrochemistry	1/4/93
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	04/27/92
8.3.1.3.4.2: Biological Sorption and Transport/LANL	3/25/93
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
8.3.1.5.1.2: Paleoclimate Study: Lake, Playa, and Marsh Deposits	04/27/92
8.3.1.5.1.3: Climatic Implications of Terrestrial Paleocology/USGS	09/03/92
8.3.1.5.1.4: Analysis of the Paleoenvironmental History of the Yucca Mountain Site	12/06/91
8.3.1.5.2.1: Characterization of the Quaternary Regional Hydrology/USGS	06/08/90
8.3.1.5.2.2: Characterization of Future Regional Hydrology due to Climate Change	4/5/93
8.3.1.8.1.1: Probability of Magmatic Disruption of the Repository/LANL	10/5/91
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	11/12/91
8.3.1.14.2: Studies to Provide Soil and Rock Properties of Potential Locations of Surface and Subsurface Facilities	01/24/92
8.3.1.15.1.8: In Situ Design Verification	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	5/18/92
8.3.1.17.3.4: Effects of Local Site Geology on Surface and Subsurface Ground Motions/USGS	6/8/92
8.3.1.17.4.1: 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
8.3.1.17.4.5: 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
8.3.1.2.1.4: Regional Hydrologic Synthesis and Modeling	NRC	1	Response sent 7/23/92
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	In preparation
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
8.3.1.3.2.1: Mineralogy, Petrology and Chemistry Along Transport Pathways	NRC	6	Response sent 10/29/91
	NV	12	Response sent 2/24/93
8.3.1.4.2.1: Characterization of Vertical and Lateral Distribution of Stratigraphic Units within the Site Area	NRC	3	Response sent 3/22/93

Study Plan	Source & No. of Comments		Status
8.3.1.5.1.4: Analysis of the Paleoenvironmental History of the Yucca Mountain Site	NRC	1	Response sent 9/16/92
8.3.1.5.2.1: Quaternary Regional Hydrology	NRC	9	Response sent 12/19/90
	NV	10	Response sent 9/19/91
8.3.1.8.1.1: Probability of Volcanic Eruption Penetrating the Repository	NV	9	Response sent 7/19/92
	NRC	13	Response sent 3/9/93
8.3.1.8.5.1: Characterization of Volcanic Features	NV	5	Response sent 8/23/91
	NRC	3	Response sent 7/24/91
8.3.1.9.2.2: Water Resource Assessment of Yucca Mountain	NRC	1	Response sent 6/29/92
	NV	24	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	Response sent 8/31/92
	NV	10	Response sent 8/21/92
8.3.1.16.1.1: Characterization of Flood Potential	NV	9	Response sent 6/6/91
	NRC	1	Telecon resolution 6/17/91
8.3.1.17.3.1: Relevant Earthquake Sources	NRC	1	Response sent 8/15/92
	NV	32	Response sent 4/21/93
8.3.1.17.3.4: Effect of Local Site Geology on Surface and Subsurface Motion	NRC	1	Response sent 9/4/92
	NV	25	Response sent 4/27/93
8.3.1.17.4.1: Historic and Current Seismicity	NRC	3	Telecon resolution 8/15/91

Study Plan	Source & No. of Comments	Status
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
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	Response sent 4/9/93
8.3.4.2.4.3: Characterization of the Geomechanical Attributes of the Waste Package Environment	NRC 3	In preparation

LEGEND FOR TABLE 1

Submit to YMP	Gives the actual date of the submission of the draft study plan.
Screening Review Complete	Date that screening review was received by the Project Office. 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.
Comment Resol. Meeting	Date that comment resolution meeting to agree on proposed comment resolutions was completed. An "N/A" indicated that a comment resolution meeting was not required.
PI Revision Complete	Date that revised study plan that responds to Project Office and Headquarters comments is submitted to the Project Office.
Verify Comm. Res.	Date that the verification of actual dispositions of comments is completed by reviewers.
PO Approve	Date that Project Office approves the plan.
Submit To NRC	The date that the study plan is submitted to the NRC for review.
NRC Phase 1 Review	Date that NRC Acceptance and Start-Work Reviews are completed.
NRC Phase 2 Review	Date that NRC Detailed Technical Reviews are completed or note that none will be completed or the review will be deferred.

#	SP NAMES/CODE	SP NUMBER	SUBMIT TO YMP	SCREENING REVIEW COMPLETE	COMMENTS TO PI	COMMENT RESOL MEETING	PI REVISION COMPLETE	VERIFY COMMENT RESOL	PO APPROVE	SUBMIT TO NRC	NRC PHASE I REVIEW	NRC PHASE II REVIEW
	NRC & NV COMMENTS TABULATED IN SECTION 4.3											
	INADVER HUMAN INTRU YUC MTN EXPLO/EXT NAT RES/M&O											
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	2/25/91	2/21/91	2/26/91	3/20/91	5/16/91	11/12/91	NONE
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	NA	12/2/92					
65	STUDIES TO PROVIDE SOIL/ROCK PROP OF POTENTIAL LOCATIONS OF SURFACE/SUBSURFACE FACILITIES/USGS	8.3.1.14.2	7/15/91	7/23/91	8/11/91	NA	8/21/91	9/22/91	10/01/91	10/16/91	1/24/92	
66	LAB THERMAL PROPERTIES/SNL	8.3.1.15.1.1	3/17/88	NA	11/1/89	12/5/89	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	2/10/93	4/8/93					
67	LAB THERMAL EXPANSION TESTING/SNL	8.3.1.15.1.2	12/1/88	12/20/88	Done	8/1/89	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	2/10/93	4/8/93					
68	LAB DETERMIN MECH PROP INTACT ROCK/SNL	8.3.1.15.1.3	2/8/88	NA	7/6/88	7/7/88	11/29/88		5/21/91	6/21/91	DEFERRED	
69	LAB DETERMIN MECH PROP FRACTURES/SNL	8.3.1.15.1.4	10/23/91	2/5/92	5/12/92	N/A	4/20/93					
70	EXCAVATION INVESTIGATIONS/SNL	8.3.1.15.1.5	3/26/87	NA	Done	6/9/87	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								
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	NA	11/23/92	1/12/93	2/3/93	2/8/93	4/15/93	NONE
74	CHAR SITE AMBIENT STRESS CONDITIONS/USGS (.2)	8.3.1.15.2.1	9/22/87	NA	Done	12/4/87	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							
76	CHAR OF FLOOD POTENTIAL YUCCA MTN SITE/USGS	8.3.1.16.1.1	3/30/89	5/2/89	10/13/89	4/18/90	4/27/90	8/6/90	9/17/90	10/11/90	5/8/91	NONE
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/SNL	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	NA	5/1/91	11/15/91	12/18/91	1/16/92	5/18/92	
82	UNDERGROUND NUCLEAR EXPLOSION SOURCES/SNL	8.3.1.17.3.2										
83 R1	GRD MOTION FROM REG EARTHQUAKE AND UNE/USGS	8.3.1.17.3.3.1										
83	GRD MOTION FROM REG EARTHQUAKE AND UNE/SNL	8.3.1.17.3.3.2										
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	NA	4/16/91	8/26/91	11/14/91	12/4/91	6/8/92	NONE
85	GRD MOTION AT SITE FROM CONTROL SEIS EVENT/USGS	8.3.1.17.3.5	10/4/90	NA	2/27/92	NA	4/14/92	2/10/93				
86	PROBABILISTIC SEISMIC HAZARD ANALYSES/SNL	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	6/20/90	7/6/90	9/4/90	9/17/90	10/22/90	5/14/91	NONE
88	LOC & RECENCY OF FAULT NEAR PROSPEC SUR FACIL/USGS	8.3.1.17.4.2	12/6/88	12/14/88	Done	1/19/89	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	N/A	9/22/92	12/28/92	1/21/93	2/9/93		
90	QUAT FAULT PROXIMAL TO SITE W/IN NE-TREND	8.3.1.17.4.4	8/3/92	8/5/92	9/25/92	NA	10/26/92	2/24/93	3/18/93			

