



Department of Energy

Washington, DC 20585

January 21, 1994

Mr. C. William Reamer, Acting 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. Reamer:

This letter transmits the Office of Civilian Radioactive Waste Management (OCRWM) Yucca Mountain Site Characterization Project Office (YMPO) Monthly Study Plan Status Report for the month of December 1993. This report summarizes review and approval status of Site Characterization Plan study plans for the Yucca Mountain Site Characterization Project. This summary includes the major accomplishments in the process of developing study plans for the month of December 1993, and the current status of all study plans that are currently planned or in review at the YMPO, 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, December 1993

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PDR

ADD: Charlotte Abrams

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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
C. Abrams, NRC

**MONTHLY STUDY PLAN STATUS
FOR DECEMBER 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 December 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.

This month we have introduced a minor change to the study plan tracking sheet at the end of this report. We have changed the headings for the NRC reviews to reflect their new procedures and we have added a column to track the technical reviews provided by the State of Nevada. This information about State of Nevada comments is in addition to the information that has always been provided in section 4.3 of this report.

Study Plan Breakdown as of the end of December 1993

	<u>Initial Plans</u>	<u>Major Revisions</u>
Not Submitted to YMPO.....	36	
In Screening Review.....	1	0
In Project Office Review.....	1	1
Awaiting Comment Resolution.....	4	2
In Verification Audit.....	5	1
Awaiting YMPO Approval.....	0	0
Awaiting Submission to the NRC.....	0	0
Awaiting NRC Initial Review.....	8	6
Accepted by the NRC.....	49	5
Totals.....	104	15
Total Submitted to the NRC.....	57	10

2.0 STUDY PLAN HIGHLIGHTS FOR THE MONTH OF DECEMBER, 1993

2.1 NEW STUDY PLAN SUBMITTALS

Two new Study Plans, 8.3.1.5.1.6 Characterization of Future Regional Climates and Environments and 8.3.4.2.4.2 Hydrologic Properties of the Waste-Package Environment were submitted to YMPO in December.

2.2 REVIEW COMMENTS COMPLETED

No Study Plans completed the initial YMPO technical review in December.

2.3 COMMENT RESOLUTION MEETINGS

No comment resolution meetings were held in December.

2.4 STUDY PLAN REVISIONS

No revisions of a Study Plan to resolve reviewer's comments was completed in December.

2.5 COMMENT VERIFICATION

No Study Plans completed verification of comment resolution in December.

2.6 STUDY PLANS APPROVALS

One Study Plan, 8.3.1.2.2.8 R1 Fluid Flow in Unsaturated, Fractured Rock, was approved by YMPO in December.

2.7 COMPLETED NRC REVIEWS

No Study Plan reviews were completed by the NRC in December.

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 the Project Office.

Identification/Organization	Date Draft Transmitted
8.3.1.17.4.1 R1: Current & Historic Seismicity/USGS	11/16/93
8.3.1.5.1.6: Characterization of Future Regional Climates and Environments/SNL	12/29/93
8.3.4.2.4.2: Hydrologic Properties of the Waste-Package Environment/LLNL	12/20/93

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
8.3.1.5.1.1: Characterization of Modern Regional Climate/USGS	8/30/93
8.3.1.15.1.3 R1: Laboratory Determination of the Mechanical Properties of Intact Rock/SNL	9/23/93
8.3.1.15.1.5 R1: Excavation Investigations/SNL	5/10/93
8.3.1.17.4.12: Tectonic Models and Synthesis/USGS	7/30/93
8.3.4.2.4.4: Engineered Barrier System Field Tests/LLNL	9/10/93

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
8.3.1.3.1.1: Groundwater Chemistry Model/LANL	11/8/93
8.3.1.3.4.1/8.3.1.3.4.3: Batch Sorption Studies/ Development of Sorption Models/LANL	10/22/93
8.3.1.8.5.2: Characterization of Igneous Intrusive Features/USGS	5/19/93
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

3.4 BEING PREPARED FOR PROJECT OFFICE APPROVAL

None

3.5 APPROVED STUDY PLANS

None

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
8.3.1.2.2.7 R1: Hydrochemical Characterization of the Unsaturated Zone/USGS	9/17/93
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
8.3.1.3.6.2: Diffusion/LANL	8/12/93
8.3.1.8.1.2: Physical Processes of Magmatism and Effects on the Potential Repository/LANL	10/4/93
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	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	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
8.3.1.2.2.9: Site Unsaturated Zone Synthesis & Modeling	11/8/93
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
8.3.1.2.3.3: 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	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
8.3.1.4.3.1: Systematic Acquisition of Site-Specific Subsurface Information/SNL	1/11/93
8.3.1.5.1.2: Paleoclimate Study: Lake, Playa, and Marsh Deposits	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
8.3.1.5.2.1.1 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	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	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
8.3.1.17.3.5: 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
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
8.3.1.2.2.5: Diffusion Tests in the Exploratory Studies Facility	NRC	5	Response sent 8/30/93
8.3.1.2.2.6: Characterization of Gas Phase Movement in the Unsaturated Zone	NV	18	Response sent 4/2/93
8.3.1.2.2.7: Hydrochemical Characterization of the Unsaturated Zone	NV	27	In Preparation
8.3.1.2.2.8: Fluid Flow in Unsaturated, Fractured Rock	NRC	1	Response sent 7/23/92
8.3.1.2.3.1.1-6: Characterization of the Site Saturated Zone Ground Water Flow System	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

Study Plan	Source & No. of Comments	Status
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 NV 12	Response sent 10/29/91 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 NRC 2	Response sent 3/22/93 Response sent 9/3/93
8.3.1.5.1.4: Analysis of the Paleoenvironmental History of the Yucca Mountain Site	NRC 1 NV 9	Response sent 9/16/92 In Preparation
8.3.1.5.2.1: Quaternary Regional Hydrology	NRC 9 NV 10	Response sent 12/19/90 Response sent 9/19/91
8.3.1.5.2.1: Quaternary Regional Hydrology R2	NRC 3 NV 7	Response sent 12/27/93 In Preparation
8.3.1.5.2.2: Characterization of Future Regional Hydrology	NV 12	In Preparation
8.3.1.8.1.1: Probability of Volcanic Eruption Penetrating the Repository	NV 9 NRC 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
8.3.1.8.5.1: Characterization of Volcanic Features	NV 5 NRC 3	Response sent 8/23/91 Response sent 7/24/91
8.3.1.9.2.2: 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

Study Plan	Source & No. of Comments		Status
8.3.1.14.2: Studies to Provide Soil and Rock Properties for Potential Locations of Surface Facilities	NRC NV	1 10	Response sent 8/31/92 Response sent 8/21/92
8.3.1.15.1.8: In-Situ Design Verification	NV	3	In Preparation
8.3.1.16.1.1: Characterization of Flood Potential	NV NRC	9 1	Response sent 6/6/91 Telecon resolution 6/17/91
8.3.1.17.3.1: Relevant Earthquake Sources	NRC NV	1 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 NV	1 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 NV	3 3	Telecon resolution 8/15/91 In Preparation
8.3.1.17.4.2: Location and Recency of Faulting Near Prospective Surface Facilities	NRC NV	16 3	Response sent 12/19/90 Response sent 10/15/90
8.3.1.17.4.4: Quaternary Faulting within NE-Trending Zones	NRC	3	In preparation
8.3.1.17.4.6: Quaternary Faulting	NRC NV	1 14	Response sent 12/16/91 Response sent 3/8/93
8.3.1.17.4.10: Geodetic Leveling	NV NRC	16 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 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.
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 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 NUMBER	SUBMIT TO YMP	SCREENING REVIEW COMPLETE	COMMENTS TO PI	PI REVISION COMPLETE	VERIFY COMMENT RESOL	PO APPROVE	SUBMIT TO NRC	NRC INITIAL REVIEW	NRC DETAILED REVIEW	NV REVIEW
NRC & NV COMMENTS TABULATED IN SECTION 4.3												
63	INADVER HUMAN INTRU YUC MTN EXPLO/EXT NAT RES/M&O 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/USGS	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							
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
82	UNDERGROUND NUCLEAR EXPLOSION SOURCES/SNL	8.3.1.17.3.2										
83 R1	GRD MOTION FROM REG EARTHQUAKE AND UNEs/USGS	8.3.1.17.3.3.1										
83	GRD MOTION FROM REG EARTHQUAKE AND UNEs/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	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		
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								
88	LOC & RECENCY 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	***

