



**Department of Energy**  
Office of Civilian Radioactive Waste Management  
Yucca Mountain Site Characterization Office  
P.O. Box 98608  
Las Vegas, NV 89193-8608

SEP 2 1994

Daniel A. Dreyfus, Director, Civilian Radioactive Waste Management, HQ (RW-1) FORS

YUCCA MOUNTAIN SITE CHARACTERIZATION OFFICE WEEKLY HIGHLIGHTS FOR THE WEEK ENDING AUGUST 12, 1994 (SCP8: N/A)

**I. FORECAST SIGNIFICANT EVENTS**

The Civilian Radioactive Waste Management System Management and Operating Contractor, U.S. Geological Survey, Los Alamos National Laboratory, and Lawrence Livermore National Laboratory all participated in the budget planning efforts for the fiscal year 1996 U.S. Office of Management and the Budget Submission Proposal.

Continue hooking up and testing utilities on the tunnel boring machine.

**Suitability and Licensing**

The Executive Secretariat will review Progress Report 10 after General Counsel concurrence in support of the Secretary of Energy's review and signature expected to be August 19, 1994.

The Seismic Hazards Topical Report Number 2 annotated outline will be forwarded to the U.S. Nuclear Regulatory Commission during the week of August 26, 1994.

**Exploratory Studies Facility**

Drilling will continue on Stagecoach Road fault exploratory boreholes. Drilling operations will continue at Boreholes SD-9, SD-12, and at the seismic shothole locations. Air permeability testing will continue in Borehole UE-25 NRG-7/7A. Harvesting of samples will begin around the Fran Ridge Test Block. Work will begin on the grouting feasibility study at Borehole USW UZ-16.

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Design

Continue resolution of audit findings for Design Package 2C drawings and specifications that support Phase 2 (operation after tunnel boring machine tail shield clears starter tunnel) tunnel boring machine operations. Complete comment resolution and continue comment incorporation for Design Package 1D.

II. CRITICAL ITEM STATUS - YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

A. Site Characterization Activities

1. Exploratory Studies Facility

Regarding Job Package 92-20, Exploratory Studies Facility North Portal Pad and Facilities, began two shift, five days-a-week assembly of the tunnel boring machine. Continue testing tunnel boring machine and hooking up utilities. Hooking up electrical and welding on ramp deck on gantry car 5.

2. Construction

Laying rail from the starter tunnel to the muck car dumping facility.

Continued construction of the subsurface waste water and fire/potable water lines on the North Portal Pad. Installing fire water and potable water lines.

Continuing construction on the switchgear building.

Placing fill to level water tank pad for water supply tanks on Exile Hill and stripping topsoil from the North Portal Pad extension area.

The following milestone represents the near-term plan for the Exploratory Studies Facility activities--begin tunnel boring machine operations August 8, 1994--delayed.

Revised schedule being developed for Phase 1 (initial test excavation) and Phase 2 (operation after tunnel boring machine tail shield clears the starter tunnel) tunnel boring machine operations. Initial startup of Phase 1 tunnel boring machine operations will occur after the closure of the Operational Readiness Review action items for Phase 1 currently scheduled for August 22, 1994.

3. Design

Complete resolution of audit findings and initiate U.S. Department of Energy Acceptance Review and baselining of Design Package 2C drawings and specifications that support Phase 1 (initial test excavation) tunnel boring machine operations by the Civilian Radioactive Waste Management System Management and Operating Contractor, Change Control Board. Continue comment resolution and comment incorporation from the 90 percent Design Review for Design Package 1D. Continuing design activities for Design Package 8A and the Integrated Data and Control System.

4. Suitability and Licensing

Progress Report 10 was signed by Daniel Dreyfus on July 29, 1994. Congressional Programs signed concurrence on August 9, 1994, and General Counsel is still reviewing for concurrence.

B. Site Characterization Testing

Exploratory drilling operations progress is summarized as follows:

<u>Borehole</u>	<u>Current Core Depth 08/12/94</u>	<u>Current Ream Depth 08/12/94</u>	<u>Total Planned Depth</u>
SD-9	453.9 meters (1489.2 feet)	400.7 meters (1314.5 feet)	646.2 meters (2,120 feet)
SD-12	390.4 meters (1280.8 feet)	390.1 meters (1279.7 feet)	701.04 meters (2,300 feet)

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Regarding Job Package 94-04, SD-12 Borehole, the bottom of the borehole is presently in the Topopah Spring (TSW<sub>3</sub>) unit.

Regarding Job Package 94-06, SD-9 Borehole, the original 6-inch diameter hole is still being reamed to 8.5-inch diameter to prepare to set casing and a packer to seal out water entering the hole at a depth of 1,353 feet.

Regarding Job Package 93-15, Borehole NRG-7/7A, gas permeability testing by U.S. Geological Survey continues.

Regarding Stagecoach Road fault exploratory boreholes, drilling of Borehole SR-2 was completed to a final depth of 85.6 meters (280.7 feet).

Drilling continued on the first of approximately 20 planned seismic shotholes. Shothole SRS-201 reached a depth of 38.1 meters (125.0 feet).

Conducted 11 core examinations at the Sample Management Facility for scientists from the U.S. Geological Survey, University of Nevada/Reno, Los Alamos National Laboratory; and Sandia National Laboratories.

The following is a listing of site characterization field activities that are currently active:

SITE CHARACTERIZATION PLAN ACTIVITY	TITLE	COMMENTS
8.3.1.3.2.1	Mineralogy, Petrology & Rock Chemistry of Transport Pathways	Exploratory Studies Facility sampling
8.3.1.3.2.2	Mineralogic & Geochemical Alteration	Exploratory Studies Facility sampling
8.3.1.4.2.1	Characterization of Vertical/Lateral Distribution of Stratigraphic Units in Site Area	Ongoing core logging
8.3.1.4.2.2	Structural Features within Site Area	Surface and Exploratory Studies Facility mapping
8.3.1.4.3.1	Systematic Acquisition of Site Specific Subsurface Information	Systematic drilling/testing
8.3.1.8.5.1	Characterization of Volcanic Features	Test pits, trenching

SITE CHARACTERIZATION PLAN ACTIVITY	TITLE	COMMENTS
8.3.1.14.2	Soil & Rock Properties of Potential Location of Surface Facilities	Trenching and ramp exploration holes
8.3.1.17.4.2	Location & Recency of Faulting Near Prospective Surface Facilities	Trench logging
8.3.1.17.4.3	Quaternary Faulting within 100 km of Yucca Mountain	Surface mapping
8.3.1.17.4.4	Quaternary Faulting in NE-Trending Fault Zones	Surface mapping
8.3.1.17.4.6	Quaternary Faulting within Site Area	Trench logging
8.3.1.2.1.1	Precipitation & Meteorological Monitoring for Regional Hydrology	Ongoing measurements
8.3.1.2.1.2	Runoff & Streamflow	Ongoing measurements
8.3.1.2.1.3	Regional Groundwater Flow System	Ongoing monitoring
8.3.1.2.2.1	Unsaturated Zone Infiltration	Logging of neutron-access holes; ponding tests
8.3.1.2.2.2	Water Movement Tracer Tests	Cl-36 measurements (surface-based testing drillholes, Exploratory Studies Facility)
8.3.1.2.2.3	Percolation in the Unsaturated Zone	Unsaturated zone drilling/testing
8.3.1.2.2.4	Characterization of Unsaturated Zone (Exploratory Studies Facility)	Hydrochemistry/radial boreholes testing
8.3.1.2.2.6	Gaseous Phase Movement in Unsaturated Zone	Unsaturated zone drilling/testing
8.3.1.2.2.7	Unsaturated Zone Hydrochemistry	Unsaturated zone drilling/testing
8.3.1.2.3.1	Site Saturated Zone Groundwater Flow System	Ongoing monitoring, C-Well testing
8.3.1.2.3.2	Saturated Zone Hydrochemistry	Ongoing monitoring
8.3.1.15.1.8	In Situ Design Verification	Construction monitoring/testing
8.3.4.2.4.4	Engineered Barrier System Field Test	Preparation of Fran Ridge Test Block

Large Block Test

Completed excavation at the Fran Ridge test block. Began drilling of presplit holes in preparation for collecting additional samples.

Site Characterization Plan/Study Plan Status

One study plan, 8.3.4.2.4.1 "Characterization of Chemical and Mineralogical Changes in the Post-Emplacement Environment," was submitted to the Yucca Mountain Site Characterization Office. No study plans were approved.

STUDY-PLAN BREAKDOWN

	Initial Plans	Major Revisions
Not Submitted to Yucca Mountain Site Characterization Office .....	27	0
In Screening Review .....	1	0
In Yucca Mountain Site Characterization Office Review .....	0	0
Awaiting Comment Resolution .....	5	6
In Verification Audit .....	4	0
Awaiting Yucca Mountain Site Characterization Office Approval ...	0	0
Awaiting Submission to U.S. Nuclear Regulatory Commission...	2	0
Awaiting U.S. Nuclear Regulatory Commission Initial-Review .....	11	7
Accepted by U.S. Nuclear Regulatory Commission .....	50	6
<b>Totals .....</b>	<b>100</b>	<b>19</b>
<b>Total Submitted to U.S. Nuclear Regulatory Commission .....</b>	<b>59</b>	<b>12</b>

State of Nevada Comments Status:

Received Comments from the State of Nevada.....	32
Responses Transmitted to the State of Nevada .....	32

U.S. Nuclear Regulatory Commission Comments Status:

Received Comments from U.S. Nuclear Regulatory Commission .....	31
Responses Transmitted from U.S. Department of Energy to U.S. Nuclear Regulatory Commission.....	29

### C. Environmental Safety and Health Programs

Eight environmental compliance and safety surveillances were conducted at the Yucca Mountain, Nevada, site ensuring compliance with permit and programmatic requirements.

The Superfund Amendments and Reauthorization Act of 1986, Title III, Section 311 Report, was submitted to the State of Nevada. This annual report notifies the State of Nevada of the site presence of diesel fuel 2 in quantities greater than the State Emergency Response Commission planning quantity threshold.

A permit application for a new drill rig to replace the Gardner-Denver 1500 was filed with the State of Nevada.

### III. GENERAL INFORMATION ITEMS

Regarding Lawrence Livermore National Laboratory Special Studies, repository scale, thermal-hydrological calculations were conducted for six sets of matrix properties: those of the Reference Information Base and for the five sets of Topopah Spring welded tuff properties listed in Pruess and Tsang (1994) and based on Flint et al. (1993). The duration of the boiling period was found to be insensitive to the range of matrix properties considered. Five of the six property sets produced similar relative humidity conditions at the end of the boiling period for three areal mass loadings (55.3, 110.5, and 150 metric tonnes uranium per acre). The sixth property set results in a substantially faster liquid-phase rewetting rate and more humid conditions by the end of the boiling period, particularly for the low thermal load and for the outer 25 percent of the two higher thermal load repositories.

Los Alamos National Laboratory management and Principal Investigators discussed technical issues and work scope with Yucca Mountain Site Characterization Office. A meeting was also held to discuss guidance for the fiscal year 1995 work in geochemistry, mineralogy/petrology, and retardation sensitivity analysis.

Los Alamos National Laboratory staff completed preparations of work scope, milestones, and budget for fiscal year 1995 activities.

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A revised draft was completed of the manuscript "Petrography, Mineralogy, and Chemistry of Calcite-Silica Deposits at Exile Hill, Nevada, in Comparison with Local Spring Deposits" (Milestone 3376). This draft will receive an internal technical review before submission to the Los Alamos National Laboratory's Technical Project Officer.

Los Alamos National Laboratory calculated diffraction patterns for various types of opal in preparation for a fiscal year 1995 milestone and a presentation at next week's Clay Mineral Society meeting. The results indicate that structural information pertaining to opal diagenesis at Yucca Mountain, may be extractable from X-ray diffraction patterns. Furthermore, the calculated diffraction patterns may be usable in quantitative analysis programs (e.g., Rietveld analysis) to improve the quantification of mineral contents from tuffs containing opal.

Los Alamos National Laboratory began analyzing a number of long-term heating samples that had been exposed to steam conditions at 100 degrees Celsius. The mineral content of the samples collected of X-ray diffraction data from several dust samples will be analyzed to determine the mineralogy of airborne dusts.

Los Alamos National Laboratory Sample Overview Committee representative approved the Consolidated Field Packaging instructions for Borehole USW SD-7 that had been discussed at the Sample Overview Committee meeting in Nevada on August 3, 1994.

The Yucca Mountain Site Characterization Office approved the following Los Alamos National Laboratory documents:

"The Nature of Interlayer Water in Smectite" (abstract) Steven Chipera, et al.

Milestone 3351, "C-13 and O-17 NMR Binding constant studies of Uranyl carbonate complexes in near-neutral aqueous solutions," David Clark, et al.

Milestone 3350, "Pu Carbonate Speciation Changes as Measured in Dilute Solutions," Drew Tait, et al.

Milestone 3330, "Complexation of Carbonate species at the Goethite Surface: Implications for Adsorption of Metal Ion in Natural Waters," Alexander van Geen, et al.

Suitability and Licensing staff completed a review of a preliminary draft of 40 CFR Part 194, "Compliance Criteria for the Waste Isolation Pilot Plant," for the U.S. Environmental Protection Agency and returned comments to Environmental Management on behalf of the Office of Civilian Radioactive Waste Management.

Suitability and Licensing staff prepared a briefing on the Erosion Topical Report for presentation to the Advisory Committee on Nuclear Waste to be held on August 16, 1994.

The U.S. Geological Survey continued to prepare the graphic lithologic log of Borehole USW SD-9, and began examination for possible stratigraphic markers in the Topopah Spring tuff in this core and core from Borehole USW NRG-7/7A. Similar work is also in progress for core from USW SD-12. The three-dimensional geologic modeling work is continuing, with additional input for the isopach and structural maps. Geochemical analyses of bulk rock samples from Boreholes USW G-1, USW G-3, and USW GU-3 have been compiled and added to the data base.

The U.S. Geological Survey tectonics work continued to revise and finalize the geologic map of southern Yucca Mountain for distribution as an Open File Report. Personnel directed the drilling of the geologic exploratory borehole at the Stagecoach Road fault site and completed some mapping and logging in Trenches 14-C and 14-D.

The U.S. Geological Survey saturated zone studies personnel continued to measure water levels in deep boreholes on and around Yucca Mountain. Work continued on the assembly and testing of the downhole pH metering device.

The U.S. Geological Survey unsaturated zone studies continued air permeability testing at Borehole USW NRG-7/7A in the middle nonlithophysal and lower lithophysal subunits of the Topopah Spring tuff. After resolving some equipment difficulties and ventilation problems in Exploratory Studies Facility Test Alcove 1, radial borehole air permeability testing began.

Technical and Management Support Services continued work related to the Drilling Support and Sample Management Department transition from the Yucca Mountain Site Characterization Office Quality Assurance Program to the Technical and Management Support Services Quality Assurance Program. Converting five existing Yucca Line Procedures to Work Instructions in progress (35 percent completed).

Technical and Management Support Services transferred technical data acquired through sample collecting and handling activities to Sandia National Laboratories.

Technical and Management Support Services completed Job Package 93-05, "NRG-2A Borehole" and submitted it to the Document Records Center.

Technical and Management Support Services completed Quality Assurance Procedure 6.2 review of the Exploratory Studies Facility Requirements Document, Revision 1, Draft A.

#### IV. PUBLIC OUTREACH AND INSTITUTIONAL ACTIVITIES

A general Project overview was given to 25 guests of the Griffith United Methodist Men's Group on August 9, 1994, in Las Vegas, Nevada.

An educational presentation on "Yucca Mountain Johnny" was given to 12 students of 4-H T.E.C.s on August 10, 1994, in Las Vegas. Also on August 10, 1994, 24 children and chaperons from the Children's Learning Center toured the Las Vegas Yucca Mountain Science Center and attended an educational presentation on radiation.

Yucca Mountain Site Characterization Project exhibits were set up and staffed for two events. These included the Nevada League of Cities annual meeting, August 11-13, 1994, Elko, Nevada; and the Eureka County Fair, August 12-14, 1994, Eureka, Nevada. Approximately 350 people viewed the exhibits.

Several tours to Yucca Mountain were conducted: August 8, 1994, for 11 guests from the U.S. Department of Energy Management Intern Development Program; on August 10, 1994, for five guests from the Nuclear Waste Technical Review Board; on August 11, 1994, for three guests from ABC News;

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and on August 12, 1994, for 40 guests from the Energy and Minerals Field Institute, Colorado School of Mines. The guests from the Colorado School of Mines were also given a pretour briefing.

Staff completed 41 external information requests. This was accomplished by providing written responses to written and verbal queries and/or by supplying existing literature.

#### V. UPCOMING EVENTS CALENDAR

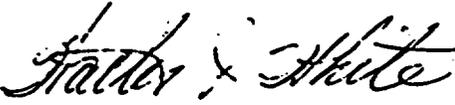
Please note that the usage of "(P)" in the calendar indicates that the event is open to the public. Educational presentations and State and Public Interactions are coordinated by the Speakers Bureau; contact Jackie Brandt at (702) 794-7759 or Lawrence Weekly at (702) 794-7896 for additional information. Exhibits are coordinated by Joanna Magruder at (702) 794-7056; and tours are coordinated by Carleen Hill at (702) 794-7375.

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>Yucca Mountain Site Characterization Project Contact</u>
A.	<u>Stakeholders' Meetings</u>		
	No significant meetings to report.		
B.	<u>U.S. Department of Energy/Headquarters Meetings</u>		
	No significant meetings to report.		
C.	<u>Civilian Radioactive Waste Management System Management and Operating Contractor/U.S. Department of Energy Meetings</u>		
	No significant meetings to report.		
D.	<u>Internal and U.S. Department of Energy/Nevada Operations Office (NV) Meetings</u>		
	No significant meetings to report.		
E.	<u>U.S. Nuclear Regulatory Commission Interactions</u>		
Tuesday, August 23	Technical Exchange: Field Heater Experiments Associated With Coupled THMC Processes	Las Vegas, NV	T. Bjerstedt

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>Yucca Mountain Site Characterization Project Contact</u>
<b>F. <u>Nuclear Waste Technical Review Board Interactions</u></b>			
No significant interactions to report.			
<b>G. <u>Advisory Committee on Nuclear Waste Interactions</u></b>			
Tuesday- Wednesday, August 16-17	66th Advisory Committee on Nuclear Waste Meeting - Topics (TBD)	Rockville, MD	C. Hanlon
<b>H. <u>National Academy of Sciences Interactions</u></b>			
No significant interactions to report.			
<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>Speaker</u>
<b>I. <u>State and Public Interactions</u></b>			
Monday, August 22	Nuclear Energy Institute ESF and TBM	Las Vegas, NV	L. Renegar
Tuesday, August 23	Yucca Mountain Speaker Series - "The Art of Caving"	Las Vegas, NV	L. Cuba
Saturday, August 27	Stakeholder Meeting - Site Suitability	Las Vegas, NV	J. Summerson S. Brocoum
<b>J. <u>Educational Interactions</u></b>			
Saturday, August 27	Discovery Day - Geology	Pahrump, NV	Various YMP Staff
<u>Date</u>	<u>Event</u>	<u>Location</u>	
<b>K. <u>Exhibits Scheduled</u></b>			
Saturday, August 13	Fallon Air Show	Fallon, NV	
Thursday- Sunday, August 18-21	Lincoln County Fair	Panaca, NV	

<u>Date</u>	<u>Event</u>	<u>Location</u>
<b>K. Exhibits Scheduled (continued)</b>		
Saturday, August 20	Yucca Mountain Open House and Tour	Las Vegas, NV
Wednesday- Sunday, August 24-28	Nevada State Fair	Reno, NV
Saturday- Sunday, August 27-28	White Pine County Fair	Ely, NV
<u>Date</u>	<u>Event</u>	<u>Escorts</u>
<b>L. Tours Scheduled</b>		
Tuesday, August 16	Office of the Nuclear Waste Negotiator	TBD
Thursday, August 18	DOE Student Forum	TBD
Saturday, August 20	Public Open House (P)	Various Escorts
Monday, August 22	Cal State Long Beach - American Society of Civil Engineers	TBD
Tuesday, August 23	Nuclear Energy Institute	TBD
Wednesday, August 24	DOE/Nuclear Regulatory Commission	TBD
Tuesday, August 30	Associate Secretary for Field Management	R. Nelson

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*for*   
Robert M. Nelson, Jr.  
Acting Project Manager