Department of Energy
Office of Civilian Radioactive Waste Management
Yucca Mountain Site Characterization Office
P.O. Box 98608
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OCT 0 4 1994

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

YUCCA MOUNTAIN SITE CHARACTERIZATION OFFICE WEEKLY HIGHLIGHTS FOR THE WEEK ENDING SEPTEMBER 16, 1994 (SCPB: N/A)

I. FORECAST SIGNIFICANT EVENTS

Suitability and Licensing

A U.S. Department of Energy-U.S. Nuclear Regulatory Commission joint management meeting is scheduled for September 21, 1994, in Rockville, Maryland. Final agenda items include discussions of the draft site suitability evaluation process, the U.S. Department of Energy five-year planning exercise, Site Characterization Plan and Study Plan consolidation, multipurpose canister burn-up credit, and the status of U.S. Department of Energy-U.S. Nuclear Regulatory Commission products.

Construction

Connect steam piping at the precast yard for the curing system for the tunnel invert liner segments.

Begin Phase 1 of tunnel boring machine operations (initial test excavation).

II. CRITICAL ITEM STATUS - YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

A. Site Characterization Activities

1. Exploratory Studies Facility

Initial startup of Phase 1, tunnel boring machine operations, will occur after the closure of the Operational Readiness Review action items for Phase 1 and the baselining and release of the portion of Design Package 2C that supports Phase 1. Currently, all actions are on schedule for completion to support startup of Phase 1 operations the week of September 19, 1994. Phase 2 operations will occur after closure of the Operational Readiness Review action items for Phase 2 and the baselining and release of the remainder of Design Package 2. Phase 2 operations, based on the current schedule, are estimated to begin between September 30 and October 21, 1994.

YMP-5

140013

WM-11
NH03
102.8

Continued preparing the tunnel boring machine for operation by installing, adjusting, and checking the electrical, hydraulic, conveyor, and ventilation systems at the Exploratory Studies Facility North Portal Pad and Facilities. In process of modifying steps, handrails, and guard rails as directed by the safety inspectors.

2. Construction

Completed final testing of tunnel boring machine electrical, hydraulic, conveyor, ventilation systems, and minor safety modifications in preparation for start of operations.

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

Continuing construction of the switchgear building by placing forms and reinforcing steel for the cable trays and trench stem walls.

Continued excavating the water line trench and placing bedding sand from the Booster Pump Station to the tank pads on Exile Hill and from the tank pads to the North Portal pad.

Continued installing steam piping at the precast yard for the curing system for the tunnel invert liner segments.

3. Design

Completed U.S. Department of Energy acceptance and baselining by the Civilian Radioactive Waste Management System Management and Operating Contractor Change Control Board of Design Package 2C drawings and specifications that support Phase 1 of tunnel boring machine operations. Continued resolution of audit findings for Design Package 2C drawings and specifications that support Phase 2 of tunnel boring machine operations. Continue updating the Basis for Design to incorporate 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 approved by the U.S. Secretary of Energy on September 14, 1994. The camera-ready copy was forwarded to the U.S. Department of Energy/ Headquarters for printing on September 16, 1994. Final distribution is expected by September 30, 1994.

B. Site Characterization Testing

Exploratory drilling operations progress is summarized as follows:

Borehole	Current Core Depth 09/16/94	Current Ream Depth 09/16/94	Total Planned Depth
SD-9	584.2 meters (1916.1 feet)	453.4 meters (1487.6 feet)	646.2 meters (2,120 feet)
SD-12	437.6 meters (1435.3 feet)	427.1 meters (1401.0 feet)	701.04 meters (2,300 feet)

Regarding Job Package 94-04, SD-12 Borehole, coring resumed for two shifts in order to complete coring through the Topopah Spring/Calico Hills contact.

Regarding Job Package 94-06, SD-9 Borehole, coring continued. The bottom of the borehole is in the Calico Hills tuffs.

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

Regarding Borehole UE-25 NRG-6, the original 14 centimeter (5 1/2 inch) hole is being reamed out to 21.6 centimeter (8 1/2 inch) diameter to accommodate test instruments. Reaming progressed to a depth of 245.2 meters (804.2 feet) prior to mechanical difficulties which resulted in fishing operations.

Seismic reflection line shothole SRS-203 was drilled to a depth of approximately 46.3 meters (152 feet) after difficulties in drilling required termination of the hole. Drilling started on Shotholes SRS-205 and SRS-207 and advanced to 30.5 meters (100 feet) and 19.3 meters (63.2 feet) respectively.

Conducted eight core examinations at the Sample Management Facility for scientists from the U.S. Geological Survey and Sandia National Laboratories. The facility also accepted 53 large block samples from the Fran Ridge Test Block.

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
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 collection of rock samples at the Fran Ridge Large Block Test. Excavation around the large block is nearly completed. Preparations are underway for detailed geologic mapping of the perimeter of the large block.

Site Characterization Plan/Study Plan Status

Study Plan 8.3.3.2.2.3, "In Situ Testing of Seal Components," was submitted to the Yucca Mountain Site Characterization Office. This study plan is an addition to the tracking system making the total number of study plans now 101. No study plans were approved by the Yucca Mountain Site Characterization Office.

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	1	0
Awaiting Comment Resolution	5	5
In Verification Audit	3	1
Awaiting Yucca Mountain Site Characterization Office Approval	0	0
Awaiting Submission to U.S. Nuclear Regulatory Commission	1	0
Awaiting U.S. Nuclear Regulatory Commission Initial Review	9	3
Accepted by U.S. Nuclear Regulatory Commission	54	10
Totals	101	19
Total Submitted to U.S. Nuclear Regulatory Commission	63	13

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	39
Responses Transmitted from U.S. Department of Energy to U.S. Nuclear Regulatory Commission	29

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Environmental Safety and Health Programs

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

Staff scientists completed the blood chemistry field sampling of the desert tortoise for upper respiratory track disease, as required by the U.S. Fish and Wildlife Service for threatened and endangered species.

The Nevada Division of Environmental Protection approved the application to inject tracer gasses into shotholes in compliance with Underground Injection Control permit stipulations.

III. GENERAL INFORMATION ITEMS

Lawrence Livermore National Laboratory Special Studies work, in support of the thermal loading system study, has calculated the impact of enhanced gas-phase diffusion and matrix hydrological properties on temperature and relative humidity conditions in the potential repository. The duration of the boiling period, t_{bp}, is insensitive to the range of six sets of matrix hydrological properties considered. However, enhanced vapor diffusion can enhance the rate of heat loss from the repository, modestly decreasing t_{bp}, particularly for the inner 75 percent of the repository. Enhanced vapor flow can also reduce the relative humidity at the end of the boiling period, particularly at the repository edge.

Los Alamos National Laboratory Mineralogy/Petrology researchers completed an optical analysis of microautoradiographs of six samples. They found that specific track concentrations for plutonium-exposed samples were strongly correlated with alteration products of orthopyroxenes in the Prow Pass Tuff. This correlation provides evidence of a specific trace phase that may have strong retardation potential; however, a weaker but more ubiquitous concentration is associated with clays that occur in most samples. These important preliminary results indicate that both stratigraphically-restricted trace minerals and widely-dispersed minor minerals may be important in considering the total radionuclide retardation potential of the Yucca Mountain site.

Using X-ray powder diffraction, Los Alamos National Laboratory analyzed 15 fracture-lining samples located above the static water level from drill core UE-25 UZ-16. The zeolite minerals lining the fractures appeared to correspond to the zeolite minerals found in the bulk rock.

The manganese-oxide minerals lining fractures were found to follow the same trend as observed over the rest of Yucca Mountain where rancieite and lithiophorite are the prominent species occurring above the static water level.

A meeting was held between Los Alamos National Laboratory and representatives of the Civilian Radioactive Waste Management System Management and Operating Contractor. Possible responses to the U.S. Nuclear Regulatory Commission comments on the Erosion Topical Report were discussed. The group evaluated several levels of action that might be taken and how their responses might impact this year's scope of work. This information was forwarded to Yucca Mountain Site Characterization Office upper management for their review and comment.

The U.S. Geological Survey personnel spent several days in Raven Canyon on the south end of Yucca Mountain mapping the section exposed there. Logistical preparations (badging, vehicles, supplies, etc.) have begun for the seismic crews that will be on site in November 1994.

The U.S. Geological Survey air permeability rig moved off Borehole USW NRG-7/7A on Monday to make room for the Reynolds Electrical & Engineering Co., Inc. drill rig. The U.S. Geological Survey personnel measured the fluid level in this hole and found that it had dropped by about 10 feet of the level measured on video logs in June 1994. Personnel will collect a suite of fluid samples from this borehole before the reaming starts. Water level measurements were also performed on Borehole USW SD-9 in support of the drilling to check influx from a wet zone at the bottom of the hole. The data showed water accumulating at a rate of about 5 gallons per hour.

The U.S. Geological Survey Deputy Technical Project Officer traveled to Sweden with personnel from the Los Alamos National Laboratory Technical Coordination Office to view geologic mapping procedures used in the Stripa facility in Sweden.

Training for the new U.S. Bureau of Reclamation tunnel mapping personnel was completed for volcanology and fractures and underground mapping techniques. The U.S. Geological Survey also sponsored a two-day course on Wilderness First Aid in Las Vegas and at the Field Operations Center for U.S. Geological Survey and Los Alamos National Laboratory field personnel working in areas more than an hour from medical aid. The course was highly successful and will probably be repeated.

Technical and Management Support Services staff completed the Drilling Support and Sample Management Department transition of the quality assurance program from the Yucca Mountain Site Characterization Office to Technical and Management Support Services. Converted five existing Yucca Line Procedures to Work Instructions and completed a new Work Instruction. Completed all related training assignments.

Technical and Management Support Services staff formed a working group to ensure compatibility of sampling and measuring criteria between the Drilling Support and Drilling Engineering Divisions within the Drilling Support and Sample Management Department. Issues discussed included core loss data with respect to rate of penetration, fracture frequency, and drill bit ware.

Technical and Management Support Services staff continued developing work programs and cost estimates for borehole instrumentation on UE-25 NRG-6 and UE-25 NRG-7/7A; and borehole cleanout, wellhead box installation, and geophone installation on USW UZ-16.

Technical and Management Support Services staff completed multiple scenarios for fiscal year 1995 to optimize the funding for work planned to meet Technical Site Suitability guidelines.

Suitability and Licensing

The Yucca Mountain Site Characterization Office developed a draft strategy for resolution of U.S. Nuclear Regulatory Commission staff comments on the Extreme Erosion Topical Report. The strategy relies on using available data to corroborate the findings and positions expressed in the topical report. Suitability and Licensing staff briefed the Office of Civilian Radioactive Waste Management on the report's status and strategy.

Suitability and Licensing staff and other project organizations participated in the Nuclear Waste Technical Review Board Panel meeting on Hydrogeology and Geochemistry held September 12-13, 1994, in Las Vegas. The focus of the meeting was ground water travel time and its relative importance to long-term repository performance. The presentations addressed the original intent of 10 CFR Parts 60 and 960; the technical basis for the 1,000 year containment criterion; computational and conceptual problems of highly heterogenous materials; and the U.S. Department of Energy Proposed Program Approach to satisfying the ground water travel-time requirements.

The Yucca Mountain Site Characterization Office transmitted a letter to the Office of Civilian Radioactive Waste Management, Office of Systems and Compliance, seeking agreement on the interpretation of 10 CFR Part 21, Reporting of Defects and Noncompliance. The recommendation suggests that the Office of Civilian Radioactive Waste Management develop and implement a Part 21 compliance procedure and direct affected project offices and participants to develop and implement appropriate compliant procedures.

IV. PUBLIC OUTREACH AND INSTITUTIONAL ACTIVITIES

On September 15, 1994, in Las Vegas, Nevada, educational presentations on Native American Culture were given to 28 students and guests of the University of Nevada, Las Vegas; and to 10 guests at the Western Shoshone National Council, discussing views on nuclear development and its effects on Native Americans. A presentation on Indian petroglyphs was given to 40 guests of the Rock Art Club on the same date.

A general Yucca Mountain Site Characterization Project overview was given to 17 guests of Historically Black Colleges and Universities on September 12, 1994, in Las Vegas. A presentation was also given on geology and the McCaw Mining Project to 20 guests of the Las Vegas Gem Club, on the same date, in Las Vegas.

Yucca Mountain Site Characterization Project scientists and staff sponsored a Cadette Girl Scout Workshop at the Las Vegas Yucca Mountain Science Center on September 10, 1994. Fifteen girl scouts earned their geology merit badges by learning about rocks and minerals, earthquakes and faults, and volcanoes.

Yucca Mountain Site Characterization Project exhibits were staffed for the Pahrump Harvest Days Festival, September 16-18, 1994, in Pahrump, Nevada. Approximately 150 people visited the displays.

Several tours to Yucca Mountain were conducted. These included tours on September 12, 1994, for a guest from Sports Afield; on September 13, for 14 guests from Historically Black Colleges and Universities; on September 14, for 20 guests for Yucca Mountain Site Characterization Project Orientation; and on September 15, 1994, for a guest from the U.S. Department of Energy Office of Economic Impact and Diversity.

Yucca Mountain Site Characterization Project staff coordinated and conducted the Affected Units of Government meeting in Las Vegas, on September 16, 1994. Staff also attended the International Association of Public Participation Practitioners Conference, co-sponsored by the U.S. Department of Energy: Environmental Management Program, September 11-14, 1994, in Washington, D.C., and the Storage and Disposition of Weapons-Usable Fissile Materials Scoping Meeting, September 14, 1994, in Las Vegas.

Staff completed 32 external information requests. This was accomplished by providing written responses to both written and verbal queries and/or by supplying available 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.

Date	Event	Location	Yucca Mountain Site Characterization Project Contact
A. Stakeholders' Meetings			
No significant meetings to report.			
B. U.S. Department of Energy/Headquarters Meetings			
No significant meetings to report.			
C. Civilian Radioactive Waste Management System Management and Operating Contractor/U.S. Department of Energy Meetings			
No significant meetings to report.			
D. Internal and U.S. Department of Energy/Nevada Operations Office (NV) Meetings			
Wednesday, September 21	NV Managers Monthly Program Review	Las Vegas, NV	R. Nelson

	Date	Event	Location	Yucca Mountain Site Characterization Project Contact
E.	U.S. Nuclear Regulatory Commission Interactions			
	Wednesday, September 21	Interaction: Bimonthly DOE/NRC Manager's Meeting	Rockville, MD	T. Bjerstedt
	Tuesday-Wednesday, September 27-28	Technical Exchange: Total System Performance Assessment	Rockville, MD	T. Bjerstedt
F.	Nuclear Waste Technical Review Board Interactions			
	No significant interactions to report.			
G.	Advisory Committee on Nuclear Waste Interactions			
	Wednesday-Thursday September 21-22	67th Advisory Committee on Nuclear Waste Meeting - Briefings on the Proposed Program Approach and the Multipurpose Canister	Rockville, MD	C. Hanlon
H.	National Academy of Sciences Interactions			
	No significant interactions to report.			
	Date	Event	Location	Speaker
I.	State and Public Interactions			
	Sunday, September 18	Yucca Mountain Speaker Series - "May the Force Be With You"	Pahrump, NV	J. Blink
	Thursday, September 22	American Nuclear Society - Rocky Mountain Chapter - General Overview	Denver, CO	R. Dyer
	Tuesday, September 27	Yucca Mountain Speaker Series - "May the Force Be With You"	Las Vegas, NV	J. Blink
	Tuesday, September 27	Nevada Environmental Energy Education Network - Public Trust in Institutions and How it Relates to Yucca Mountain	Reno, NV	G. Cook
	Wednesday, September 28	American Public Works Association International Congress and Exhibition - General Overview, Emphasis on Civil Engineering and and Environment	Chicago, IL	R. Clark

Date	Event	Location	Speaker
J. Educational Interactions			
Saturday, September 17	Boy Scouts Nuclear Energy Workshop - Nuclear Energy	Las Vegas, NV	Various YMP Staff
Thursday, September 22	Kirk Adams Elementary School - "Yucca Mountain Johnny"	Las Vegas, NV	J. Hartley
Saturday, September 24	Cadet Girl Scouts Geology Field Trip	Las Vegas, NV	Various YMP Staff
Thursday, September 29	Pahrump Sixth Grade Center - Waves and Lights	Pahrump, NV	J. Blink
Thursday, September 29	Gibson Elementary School - "Yucca Mountain Johnny"	Henderson, NV	J. Hartley

Date	Event	Location
K. Exhibits Scheduled		
Friday-Sunday, September 16-18	Pahrump Harvest Days	Pahrump, NV
Saturday, September 24	Yucca Mountain Open House/Tour	Las Vegas, NV
Saturday-Sunday, September 24-25	Science and Technology Showcase	Las Vegas, NV

Date	Event	Escorts
L. Tours Scheduled		
Wednesday, September 21	Crystal Palace Seniors	TBD
Thursday, September 22	Study Committee - Seniors	TBD
Friday, September 23	Sandia National Laboratories	TBD
Saturday, September 24	Public Open House (P)	Various Escorts
Tuesday, September 27	First Presbyterian Church	TBD

Date	Event	Escorts
L. Tours Scheduled (continued)		
Wednesday, September 28	Nevada Association of Fleet Managers	TBD
Wednesday, September 28	DOE Office of Organization and Management	TBD
Thursday, September 29	National Association of Regulatory Utility Commissioners	TBD

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