



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

AUG 01 1994

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

YUCCA MOUNTAIN SITE CHARACTERIZATION OFFICE WEEKLY HIGHLIGHTS FOR THE WEEK ENDING JULY 15, 1994 (SCPB: N/A)

I. FORECAST SIGNIFICANT EVENTS

Suitability and Licensing

There will be a management meeting with the U.S. Nuclear Regulatory Commission on July 26, 1994, in Rockville, Maryland. Agenda items include the U.S. Department of Energy proposed program approach, treatment of potential chilling effect incidents, status of major submittals and their reviews, mixed waste plans, and open item resolution.

The Yucca Mountain Site Characterization Office Assistant Manager review of Semiannual Site Characterization Progress Report 10 will begin July 18, 1994. The camera-ready concurrence copy will be distributed to U.S. Department of Energy/Headquarters on August 1, 1994.

Site Characterization Testing

Construction of a drill pad for Borehole SD-7 will continue. Drilling may continue at Borehole SD-9, and drilling will continue at Borehole SD-12. Sample collection will continue at the Fran Ridge Large Test Block. Borehole workovers in preparation for testing may continue. Cleaning of the Ghost Dance Fault trenches to prepare them for geologic logging may start. Air permeability testing will continue in Borehole UE-25 NRG-7/7A.

Exploratory Studies Facility

Two shift, six days-a-week assembly operations of the tunnel boring machine will continue. Movement of the tunnel boring machine, forward approximately 21 meters to add gantry cars 4 and 5 to its train, will be completed. Will support the Readiness Review for start of tunnel boring machine operations.

Will complete the last concrete pour for the slide at the muck car dump. Install the tripper at the muck car dump.

II. CRITICAL ITEM STATUS - YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

YMP-5

9408110335 940801
 PDR WASTE
 WM-11 PDR

102-8
 WM-11
 NAD3

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A. Site Characterization Activities

1. Exploratory Studies Facility

a. Construction

Regarding Job Package 92-20, Exploratory Studies Facility North Portal Pad and Facilities, continued two shift, six days-a-week assembly operations of the tunnel boring machine. Continued welding cutter head segments and installing and testing hydraulic/lube circuits. Completed assembly and welding of roof shield. Continued prewalk tests for the tunnel boring machine. Moving the tunnel boring machine forward approximately 21 meters to add gantry cars 4 and 5 to its train. Continued preparations for the Readiness Review for start of tunnel boring machine operations.

Completed forming and pouring gripper pads on the starter tunnel walls.

Completed second concrete pour and began forming for another concrete pour for the slide at the muck car dump.

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

Backfilling duct bank trenches and pulling wire. Preparing to place concrete in switchgear building cable trench.

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

b. Design

Completed the baselining of Design Package 2C update to the Basis for Design document by the Civilian Radioactive Waste Management System Management and Operating Contractor Change Control Board. Completed verification of the Design Package 2C drawings and specifications. Submitted Design Package 2C drawings and specifications to the Civilian Radioactive Waste Management System Management and Operating Contractor Change Control Board for baselining and to the U.S. Department of Energy for Acceptance Review. Submitted the cost impact for implementation of Design Package 2C to the Yucca Mountain Site Characterization Office Change Control Board for baselining. Sent Design Package 1D to reviewers for the 90 percent design review. Continuing design activities for Design Package 8A and the Integrated Data and Control System.

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c. Site Characterization Testing

Exploratory drilling operations progress is summarized as follows:

<u>Borehole</u>	<u>Current Core Depth 07/15/94</u>	<u>Current Ream Depth 07/15/94</u>	<u>Total Planned Depth</u>
SD-9	453.9 meters (1,489.2 feet)		646.2 meters (2,120 feet)
SD-12	341.7 meters (1,120.8 feet)	338.6 meters (1,111.0 feet)	701.04 meters (2,300 feet)

Regarding Job Package 94-04, SD-12 Borehole, drilling was discontinued for two days so borehole geophysical logging and downhole video logging could be conducted. The bottom of the borehole is presently in the Topopah Spring (TSw₂) unit.

Regarding Job Package 94-06, SD-9 Borehole, core drilling was discontinued so water sampling could be completed, and borehole geophysical logging and downhole video logging could be conducted. The bottom of the borehole is in the Calico Hills tuff (CH₁) unit.

Regarding Borehole UE-25 NRG-6 workover, attempts were made to pull the remaining casing from the borehole so downhole testing can be performed.

In addition to borehole geophysics conducted in Boreholes SD-9 and SD-12, geophysical logging was conducted in Boreholes UE-25 NRG-2, and NRG-2B; borehole video logging was conducted in USW UZ-14.

Regarding Job Package 93-15, Borehole NRG-7/7A, gas permeability testing continues.

Conducted a core party (examination of core recently processed) in conjunction with the Sample Overview Committee meeting held on July 13, 1994. The Sample Overview Committee reviewed and either approved or disapproved requests relating to core and cuttings, such as Specimen Removal Requests and sample handling and packaging requirements.

Core and cuttings were processed from drilling activities. Accepted soil samples collected by the Technical and Management Support Services Radiological/Environmental Field Programs Department and water samples from the U.S. Geological Survey. Created 427 specimens from core samples for analysis by principal investigators.

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

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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

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d. Large Block Test

Harvesting of rock samples from around the Test Block is continuing.

e. Site Characterization Plan/Study Plan Status

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	32	0
In Screening Review	0	0
In Yucca Mountain Site		
Characterization Office Review	1	1
Awaiting Comment Resolution	4	5
In Verification Audit	6	0
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	10	7
Accepted by U.S. Nuclear Regulatory		
Commission	50	6
Totals	104	19
Total Submitted to U.S. Nuclear		
Regulatory Commission	59	12

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.....	28

f. Environmental Safety and Health Programs

Environmental compliance and safety surveillances were conducted at the Yucca Mountain site ensuring compliance with permit and programmatic requirements.

III. GENERAL INFORMATION ITEMS

Regarding Lawrence Livermore National Laboratory Waste Form Testing - Spent Fuel, a comparison has been made for unsaturated (drip) tests on spent fuel fragments in a zircaloy retainer conducted at Argonne National Laboratory and earlier saturated tests on bare spent fuel conducted at Pacific Northwest Laboratories. Leachate from the tests were compared with regard to the amount of cesium and actinides in ionic (passes a 50A filter) and colloidal forms. Acid stripping was used to determine the amounts of the radionuclides precipitated on the vessel. There was considerable variability between the two pressurized water reactor fuels (which had different variables) and between them and the bare samples. Preliminary conclusions are that the plutonium, americium, and curium are not being removed congruently with the uranium matrix. These conclusions, even if upheld for the two-year tests, may not hold for longer experiment durations; that was the case when uranium dioxide tests were extended from two years out to eight years.

Los Alamos National Laboratory staff attended a meeting of the Nuclear Waste Technical Review Board in Denver, Colorado, on July 12, 1994. The following presentations were made: "Colloid Formation, Stability, and Transport, Review of Existing Information;" "Retardation of Gas-Phase Radionuclides;" "Unsaturated-Zone Flow and Transport at Yucca Mountain;" "Status and Priorities re: Solubility/Speciation of Long-Lived Radionuclides;" and "Status and Priorities Regarding Sorption of Long-Lived Radionuclides."

Los Alamos National Laboratory continued revising the report titled "Petrography, Mineralogy, and Chemistry of Calcite-Silica Deposits at Exile Hill, Nevada, in Comparison with Local Spring Deposits" (Milestone LA3376) following technical review. New electron microprobe data from detrital minerals in calcretes, B soil horizons, and wall-rock tuffs were collected to support these revisions.

Los Alamos National Laboratory staff prepared multiple thin sections of a single sample of fracture-filling calcite from the unsaturated zone at Yucca Mountain. These sections will be used in microautoradiography experiments to determine the importance of trace minerals in retardation of radionuclide migration.

Los Alamos National Laboratory continued to revise budgets for the Proposed Program Approach.

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Suitability and Licensing staff supported and participated in the Nuclear Waste Technical Review Board Full Board meeting held July 12-13, 1994, in Denver, Colorado. The focus of the first session on July 12 was mobilization and migration of radionuclides. In addition, the status of the proposed program approach was presented by Samuel Rouso and Stephan Brocoum. The main focus of the second session on July 13 was transportation of spent nuclear fuel. There was also a presentation by the Nuclear Waste Negotiator.

The Issue Resolution Steering Group will hold its periodic meeting on July 22, 1994 via video conference between Las Vegas and Washington, D.C. The group will review progress in the areas of volcanism, seismic hazards, ground water travel time, and substantially complete containment.

Regarding Rock Characteristics, the U.S. Geological Survey examined core from the lower portion, 512-673 meters (1,680-2,207 feet), of Borehole USW UZ-14, and lithologic contacts were selected. Studies also began on cores from Borehole USW SD-9 where stratigraphic contacts were selected to a depth of 165.5 meters (543 feet) and lithology was logged to a depth of 46 meters (150 feet), and on Borehole USW SD-12, where contacts were selected to 305 meters (1,000 feet) and lithology logged to 27 meters (90 feet). Detailed structural analysis of the Ghost Dance and Sundance Faults continued and a data review of measured sections of the Calico Hills rhyolite in Paintbrush Canyon was completed. Work is continuing on updating the borehole data base for isopach mapping and input to the LYNX model.

The U.S. Geological Survey Tectonics group collected samples of pedogenic (soil) carbonate from trenches in Crater Flat on the Fatigue Wash and Windy Wash Faults. The samples will be analyzed to obtain uranium-trend radiometric dates to reevaluate dates obtained about ten years ago, and to more accurately determine the last occurrence of surface-rupturing events on these faults. The U.S. Geological Survey is also investigating uranium and thorium isotopic data from carbonates on the Solitario Canyon Fault to constrain the ages of surficial units offset by past movements on this fault.

Regarding Surface Runoff Studies, U.S. Geological Survey personnel were on site to maintain the network of stream gage stations on and around Yucca Mountain.

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Regarding U.S. Geological Survey Unsaturated Zone Studies, air permeability tests continued in Borehole USW NRG-7/7A. Preparations are underway as well to begin air permeability testing in the Exploratory Studies Facility Test Alcove boreholes within the next two weeks. Personnel also collected water samples for analysis from the bottom of Borehole USW SD-9.

Regarding U.S. Geological Survey Saturated Zone Studies, results of an analysis of Topopah Spring tuff from the UE-25a-1 core indicate that there has been a complex history of rock alteration and movement of ground water through this unit. Similar studies are planned on Borehole USW UZ-14 which may indicate the origins of perched water in this drillhole.

The U.S. Geological Survey personnel continue work on trace metal analysis of the Tiva Canyon tuff as part of the Natural Resource Assessment program to characterize the possible origins of silica-rich solutions that passed through and mineralized these rocks.

The U.S. Geological Survey-Yucca Mountain Site Characterization Project Quality Assurance Office ran an internal technical audit at the Nevada Test Site. The Unsaturated Zone Hydrology programs in Meteorology, Natural and Artificial Infiltration, and Surficial Materials Properties were audited, along with the instrument calibration laboratory used by the Percolation Study program. Personnel also attended a prebid conference for the potential seismic line contractors.

Technical and Management Support Services completed the first draft of the Master Equipment List and Equipment History procedure.

Technical and Management Support Services completed the closeout process for Job Package 93-03A, "NRG-5 Borehole," on July 11, 1994.

Technical and Management Support Services updated the Table of Contents for Job Package 94-06, "USW SD-9 Access Road and Pad," Job Package 93-13, "USW SD-12 Access Road and Pad," and Job Package 93-14, "USW NRG-7 Drill Pad."

Technical and Management Support Services completed work breakdown structure 1.2.7 Test Facilities, fiscal year 1996-1998 scope of work descriptions for the fiscal year 1996 budget submittal to the U.S. Office of Management and Budget.

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IV. PUBLIC OUTREACH AND INSTITUTIONAL ACTIVITIES

General Yucca Mountain Site Characterization Project overviews were given to guests of the First International Congress on Environmental Geotechnics, in Alberta, Canada, on July 12, 1994; and to 25 guests of the Pahrump Rotary Club, in Pahrump, Nevada, on July 13, 1994. A general Yucca Mountain Site Characterization Project update with emphasis on transportation was given to members of the Nevada Legislative Committee on High-Level Radioactive Waste in Las Vegas, on July 14, 1994.

A presentation on Native American Culture was given on July 13, 1994, to 24 students of 4-H T.E.C., in Las Vegas.

Yucca Mountain Site Characterization Project staff set up and manned exhibits for Mining Days in Battle Mountain, Nevada, July 15-17, 1994. Approximately 300 people visited the displays.

Tours to Yucca Mountain were conducted on July 12, 1994, for 22 U.S. Department of Energy Summer Engineering students; on July 13, 1994, for 9 guests from the Nevada Legislature's Committee on High-Level Radioactive Waste; and on July 14, 1994, for two guests from Nuclear Advocate. Two tours were also conducted on July 15, 1994, for three guests from Energy Resource Laboratories-Taiwan and for 30 guests from Energy and Minerals Field Institute, Colorado School of Mines.

The Native American Day program titled "Visions in Culture" was publicized by announcements produced and placed by Yucca Mountain Site Characterization Project staff. Scheduled for July 30, 1994, at the Las Vegas Science Center, the event invites the public to see and participate in the making of crafts as produced by Paiute and Shoshone representatives.

Staff completed 21 external information requests. This was accomplished by providing written responses to both 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 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.

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Yucca Mountain
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Project Contact

- | <u>Date</u> | <u>Event</u> | <u>Location</u> | <u>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> | | | |
| Thursday-
Friday,
July 28-29 | YMP Monthly
Management
Meeting | Las Vegas,
NV | R. Nelson |
| D. <u>Internal and U.S. Department of Energy/Nevada Operations Office (NV) Meetings</u> | | | |
| Wednesday,
July 20 | NV Managers
Monthly Program
Review | Las Vegas,
NV | R. Nelson |
| E. <u>U.S. Nuclear Regulatory Commission Interactions</u> | | | |
| Tuesday,
July 26 | Bimonthly DOE/NRC
Manager's Meeting | Rockville,
MD | T. Bjerstedt |
| Wednesday,
July 27 | Update of the
Exploratory Studies
Facility Activities
- Design and
Construction | Rockville,
MD | T. Bjerstedt |
| F. <u>Nuclear Waste Technical Review Board Interactions</u> | | | |
| No significant interactions to report. | | | |
| G. <u>Advisory Committee on Nuclear Waste Interactions</u> | | | |
| No significant interactions to report. | | | |
| H. <u>National Academy of Sciences Interactions</u> | | | |
| No significant interactions to report. | | | |
| <u>Date</u> | <u>Event</u> | <u>Location</u> | <u>Speaker</u> |
| I. <u>State and Public Interactions</u> | | | |
| Wednesday,
July 20 | Inyo County
Project Overview | Las Vegas,
NV | M. Pitterle |
| Tuesday,
July 26 | Yucca Mountain
Speaker Series
- "Rain or Shine,
Have We Got Weather
for You" (P) | Las Vegas,
NV | D. Ambos |