



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

Reply to:
301 E. Stewart Ave., #203
Las Vegas, NV 89101

Tel: (702) 388-6125

TO: Joseph Holonich, Director, HLPD, M/S 4 H 3
FROM: Sr. On-Site Licensing Representatives' Office, Las Vegas
DATE: January 13, 1994
SUBJECT: OFFICE OF GEOLOGIC DISPOSAL (OGD) WEEKLY HIGHLIGHTS FOR THE
WEEK ENDING DECEMBER 3, 1993 - (Received 1/13/93)

Please find enclosed the above-referenced information. There is nothing requiring specific management attention.

cc: w/enc.: Charlotte Abrams, M/S 4 H 3
Anne Garcia, M/S 4 H 3

Enclosure as stated

Note to Charlotte: Enclosed please find LANL Monthly Report for December, '93,
Exploratory Studies Facility Field Test Coordination Office

210012

9401260340 940113
PDR WASTE
WM-11 PDR

102
WM-11
N440

memorandum

TWS-EES-13-LV-01-94-02
Page 1 of 4

January 3, 1994
702/295-6180
MS 735

TO: R. Oliver, LANL

FROM: R. Kovach, LANL *RO SW*

SUBJECT: MONTHLY REPORT FOR DECEMBER 1993 - EXPLORATORY STUDIES
FACILITY FIELD TEST COORDINATION OFFICE

JP 92-20 ESF NORTH PORTAL PAD AND FACILITIES

Construction of the ESF Starter Tunnel test alcove proceeded to CS 0+27.4 (90 ft), which made the alcove 22.9 meters (75 ft) deep (see Attachment 1). During the month, Reynolds Electrical and Engineering Company (REECo) has completed grouting permanent rockbolts in the Exploratory Studies Facility (ESF) and pull-testing those rockbolts. In addition, REECo commenced shotcreting selected area in the box cut at the ESF. REECo also supported the Sandia National Laboratories (SNL) Field Team that is installing construction monitoring equipment. Because of the ground conditions in the test alcove, it was agreed between construction, testing, and the U. S. Geologic Survey Principal Investigator that the test alcove could be fibercreted to its current depth, springline to springline. This was started; approximately one day remains to complete the fibercreting.

Tracer water used underground by REECo for December 1993 totaled 32.1 kiloliters (8,480 gallons), showing a total usage of 1,670 kiloliters (441,221 gallons) through the month of December (water used in the test alcove is 145.4 kiloliters, [38,408 gallons]).

JP 92-20A GEOLOGIC MAPPING

A meeting to inspect the test alcove on December 2, 1993, involved individuals from the U.S. Department of Energy (DOE)/Yucca Mountain Site Characterization Project Office, U.S. Bureau of Reclamation (USBR), U.S. Geological Survey (USGS), Civilian Radioactive Waste Management System Management & Operating (CRWMS M&O) Contractor, Nuclear Regulatory Commission, and Los Alamos National Laboratory. The representative from USBR stated that the alcove was still in the "shear zone" and that mining should continue, with two more 2.4 meter (8 ft) blasts. USBR completed geologic mapping to the face of the test alcove which is located at CS 0+27.4 (90 ft). The geological mapping

I-351595

Lo

and site characterization was completed on December 10, 1993, with the entire test alcove released to construction for shotcreting from springline to springline of the test alcove.

JP 92-20B PERCHED WATER

No perched water was identified during this period.

JP 92-20C CONSOLIDATED SAMPLING

Samples were taken on December 9, 1993, the distribution of samples for the tests being conducted in the test alcove are as follows.

Bar Code	Location	For
SPC 00500782	CS 0+13.6, (44.6 ft), 2 meters (6.6 ft) above invert right rib	S. Levy
SPC 00500779	At the face CS 0+28, (92 ft) 2.5 meters (8.2 ft) from left rib S. and 2.1 meters (7 ft) above invert	S. Levy
SPC 00500778	At the face CS 0+28, (92 ft) 2.1 meters (7.1) from right rib and 2.0 meters (6.7 ft) above invert	S. Levy
SPC 00500777	CS 0+25.7, (84.3 ft), 1.8 meters (6 ft) above invert, right rib	S. Levy
SPC 00500776	CS 0+16.1, (52.9 ft), 1.9 meters (6.3 ft) above invert, right rib	S. Levy

Two rock samples were taken by representatives from the University of Nevada at Las Vegas, they were escorted by representatives from the CRWMS M&O (see Attachment 1).

JP 92-20D CONSTRUCTION MONITORING

The SNL Field Team has continued monitoring the blasting activity and the Peak Particle Velocity (PPV) for the test alcove. The SNL Field Team completed the Rock Mass Classification Indices for the test alcove. A review of the Construction Monitoring Work Plan for the test alcove was conducted with representation from the DOE/Field Test Coordinator, Test Coordination Office,

R. Oliver, LANL
MONTHLY REPORT
January 3, 1994

TWS-EES-13-LV-01-94-02
Page 3 of 4

Construction Manager, Construction Department Manager and Principal Investigator. The SNL Field Team completed installation of the two Multi Point Borehole Extensometer (MPBX) gauges located horizontally and vertically as CS 0+56.3 (185 ft) and a vertical MPBX gauge located at CS 0+42.7 (140 ft) (see Attachment 2). In addition, the Field team gathered data from load cells and convergence pins that had previously been installed.

JP 92-20E HYDROCHEMISTRY TESTS IN THE ESF NORTH RAMP STARTER TUNNEL ALCOVE #1

No hydrochemistry tests were performed this month. A meeting was held with the Principal Investigator to outline the requirements for testing the effect of fibercrete on the rock in the test alcove, these requirements included providing blockouts in areas to be fibercreted and collecting samples.

FRAN RIDGE ESF TEST AREA

Engineered Barrier - Large Block Experiment

REECo completed drilling the 17 vertical instrumentation holes in the proposed large block (see Attachment 3). Lawrence Livermore National Laboratory (LLNL) completed a Neutron log of each of the holes. In addition, LLNL and the SNL Field Team moved the saw to the large block. REECo has removed the debris in front of the block and has commenced construction of the sump located at the foot of the large block.

The laying of telephone cable to Fran Ridge was completed.

RGK:jp02

Attachments

Cy: W. A. Girdley, DOE/YMPO, MS 717
K. Skipper, DOE/YMPO, MS 717
J. T. Sullivan, DOE/YMPO, MS 523
D. R. Williams, DOE/YMPO, MS 523
W. A. Wilson, DOE/FOC, MS 717
T. I. Fortner, DOE/YMPO, MS 523
M. L. Renegar, CRWMS M&O, MS 423
R. M. Cameron, CRWMS M&O, MS 717
T. M. Leonard, REECo, MS 408
L. E. Watson, RSN, MS 403
W. C. Kopatich, RSN, MS 403
L. S. Costin, SNL, Albuquerque, NM
D. S. Kessel, SNL/LV, MS 509
R. W. Craig, USGS/LV, MS 509

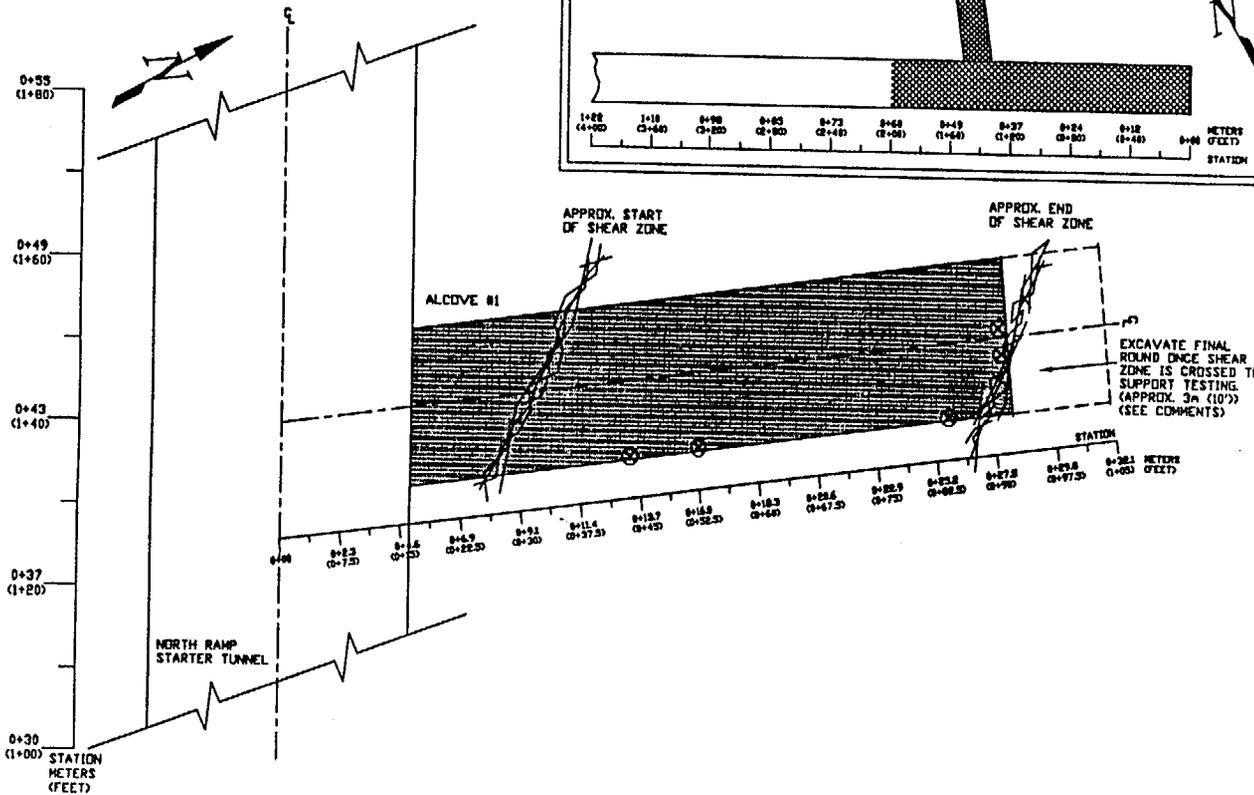
R. Oliver, LANL
MONTHLY REPORT
January 3, 1994

TWS-EES-13-LV-01-94-02
Page 4 of 4

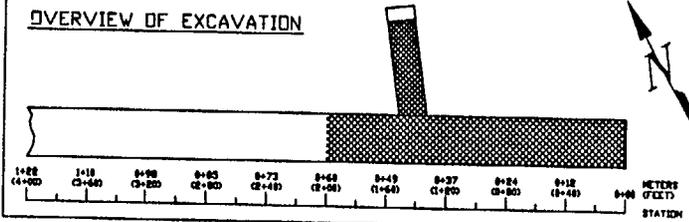
Cy cont'd:

D. L. Edwards, USGS/LV, MS 509
R. W. Spengler, USGS, Denver, CO
M. P. Chornack, USGS, Denver, CO
C. A. Peters, USGS, Denver, CO
M. F. Fahy, USBR, Denver, CO
S. C. Beason, USBR, Denver, CO
W. Lin, LLNL, Livermore, CA
N. Z. Elkins, LANL, EES-13/LV, MS 527
H. N. Kalia, LANL, EES-13/LV, MS 527
D. M. Boak, LANL, EES-13/LV, MS 527
K. L. Kinter, LANL, EES-13/LV, MS 527
D. J. Weaver, LANL, EES-13/LV, MS 527
D. M. Rashid, LANL, EES-13/LV, MS 527
A. J. Mitchell, LANL, INC-9/LV, MS 527
EES-13/LV, LANL, MS 527

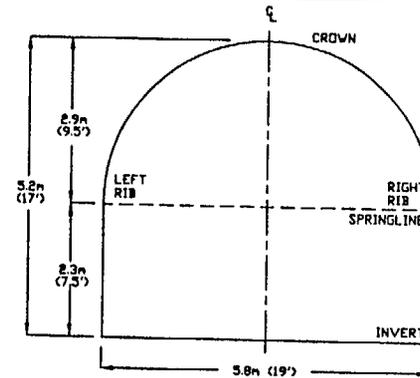
DETAILED ALCOVE SECTION - TOP VIEW



OVERVIEW OF EXCAVATION

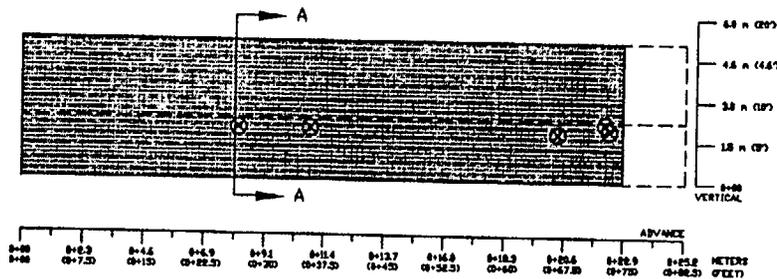
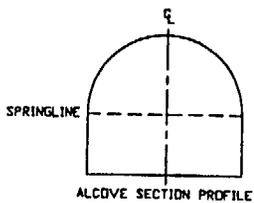


ALCOVE SECTION A-A

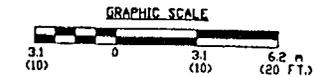


SAMPLE BAR CODE #	DATE COLLECTED	LOCATION
SPC 00500782	12/9/93	CS 0+13.6 (44.6'), 2 m (6.6') ABOVE INVERT, RIGHT RIB
SPC 00500779	12/9/93	CS 0+28 (92'), 2.5 m (8.2') FROM THE LEFT RIB AND 2.1 m (7') ABOVE INVERT AT FACE
SPC 00500778	12/9/93	CS 0+28 (92'), 2.1 m (7.1') FROM THE RIGHT RIB AND 2.0 m (6.7') ABOVE INVERT AT FACE
SPC 00500777	12/9/93	CS 0+25.7 (84.3'), 1.8 m (6') ABOVE INVERT, RIGHT RIB
SPC 00500776	12/9/93	CS 0+16.1 (52.9'), 1.9 m (6.3') ABOVE INVERT, RIGHT RIB

ALCOVE #1 DETAIL FOR SAMPLE LOCATION



COMMENTS:
ALCOVE CENTER LINE AT 0+43m (CS 1+40)
ALCOVE EXCAVATION TO APPROX. 2.3 m (7.5')
THE REQUIRED DEPTH OF ALCOVE #1 WILL BE DETERMINED IN THE FIELD AFTER EXCAVATION HAS ADVANCED THROUGH THE SHEAR ZONE.



- LEGEND:**
- CENTER LINE OF RAMP -----
 - UNEXCAVATED MATERIAL -----
 - EXCAVATED RAMP -----
 - SAMPLE LOCATION ----- ⊗
 - CONVERGENCE PINS ----- ●
 - LOAD CELLS ----- ○
 - PHOTOGRAMMETRY TARGET LOCATIONS ----- ↓
 - MAPPING PROGRESS -----
 - EXCAVATION PROGRESS -----

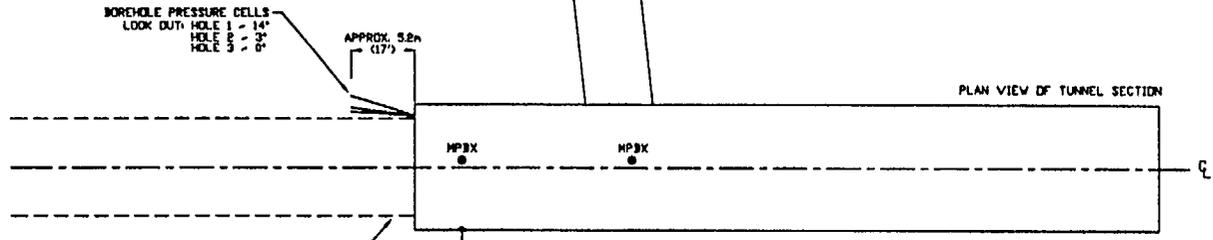
LOS ALAMOS NATIONAL LABORATORY
TEST COORDINATION OFFICE - YUCCA MOUNTAIN PROJECT

PROJECT: GEOLOGIC MAPPING/CONSOLIDATED SAMPLING AND CONSTRUCTION MONITORING IN ALCOVE #1

CAD FILE: ALCRPT6.DWG	AUTOCAD R12	SCALE: A	NOTED	REVISION: A1
DRN. BY: <i>D.J. Weaver</i>	APPROVED BY: <i>N.Z. Elkins/R.D. Oliver</i>	ON FILE	DATE DRN: 12/13/96	
NOTES: ADMINISTRATIVE/ILLUSTRATIVE USE ONLY			PLOT DATE: 1-3-94	<i>D.J.</i>

STATION
 0+60 (2+00) 0+36.9 (1+80) 0+48.8 (1+60) 0+42.7 (1+40) 0+36.5 (1+20) 0+30.5 (1+00) 0+24.4 (0+80) 0+19.3 (0+60) 0+15.8 (0+40) 0+6.1 (0+20) 0+00 (FEET)

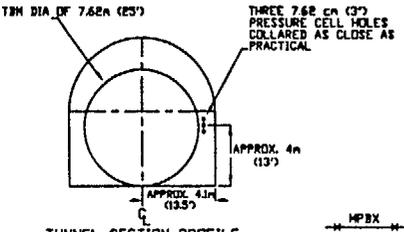
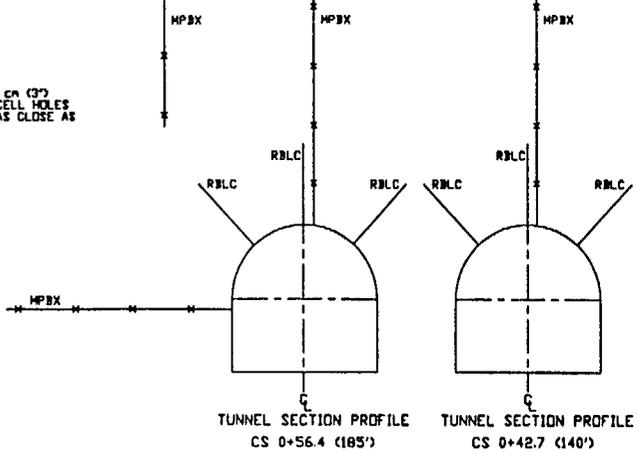
ALCOVE #1



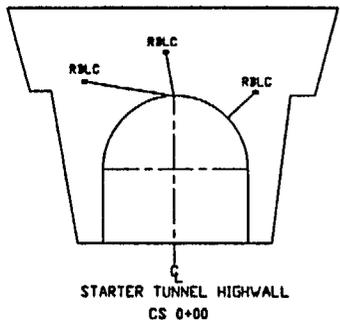
CONVERGENCE PINS

STATION	QUANTITY
0+16.5 (54')	5 PINS
0+33.5 (110')	3 PINS
0+42.7 (140')	4 PINS
0+56.4 (185')	2 PINS
0+57.9 (190')	5 PINS

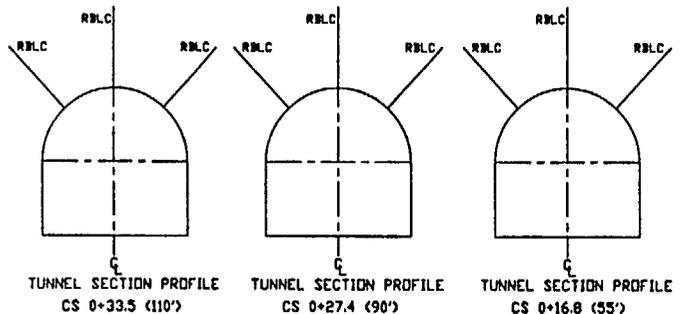
MPBX LOCATIONS



BOREHOLE PRESSEURE CELLS



HORIZONTAL ROCKBOLT LOAD CELLS



ROCKBOLT LOAD CELL LOCATIONS

LEGEND:

- CENTER LINE OF RAMP -----
- UNEXCAVATED MATERIAL -----
- EXCAVATED RAMP -----
- MPBX HOLE -----
- BOREHOLE LOCATION -----
- PRESSURE CELLS -----
- ROCK BOLT LOAD CELL -----

COMMENTS:

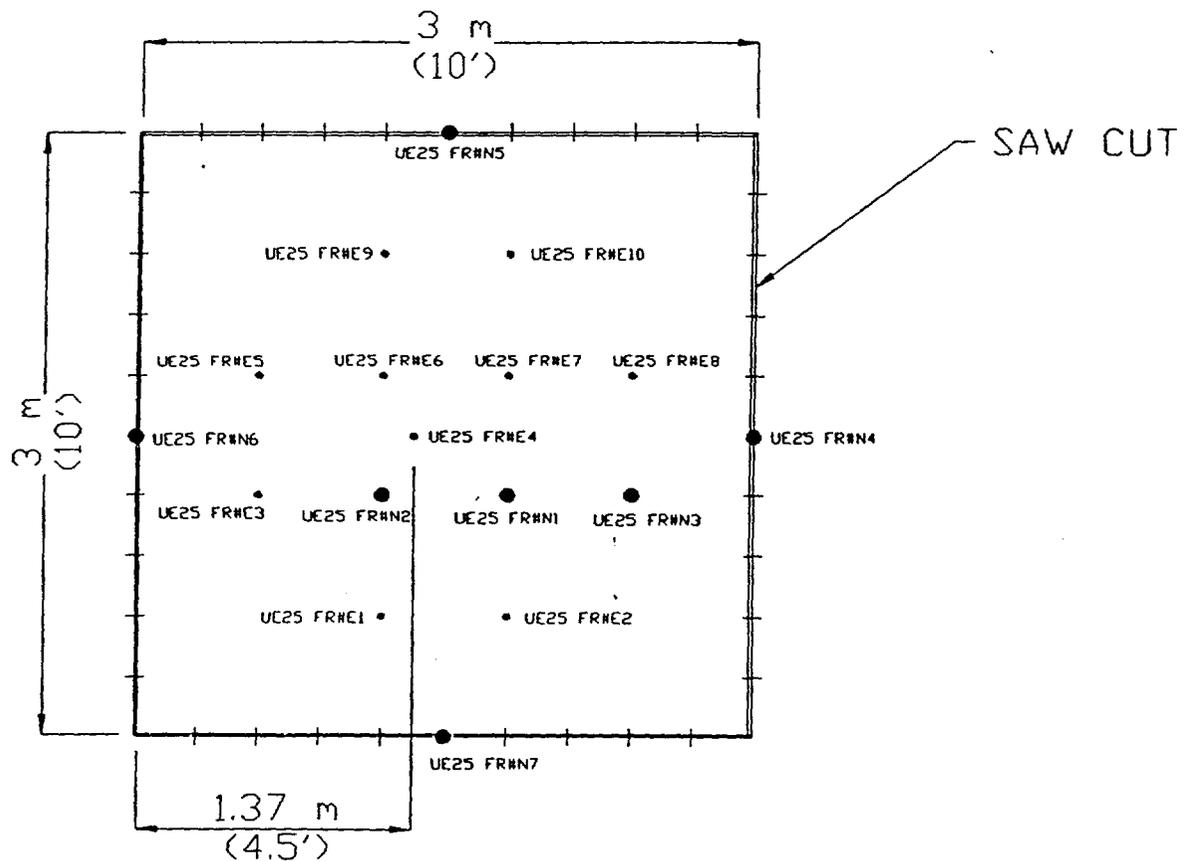
NORTH PORTAL BOX CUT FACE AT CS 0+00
 CROWN DRIFT AND RIB SECTION EXCAVATION TO 0+60m (CS 1+97). BENCH EXCAVATION TO 0+60m (CS 1+97).
 LOCATIONS OF INSTRUMENTS FROM SML SKETCH 'INSTRUMENTATION LAYOUT,' DATED 11-3-93
 RBLC = 'ROCK BOLT LOAD CELL'

LOS ALAMOS NATIONAL LABORATORY			
TEST COORDINATION OFFICE - YUCCA MOUNTAIN PROJECT			
PROJECT: CONSTRUCTION MONITORING ILLUSTRATION - MPBX AND PRESSURE CELL LOCATIONS			
CAD FILE: MPBX4.DWG	AUTOCAD R12	SIZE SCALE A	NOTED REVISION A1
DRN. BY: D.J. WEAVER	APPROVED BY: N.Z. ELKINS/R.D. OLIVER	ON FILE	DATE DRN: 12/21/93
NOTES: ADMINISTRATIVE/ILLUSTRATIVE USE ONLY			PLOT DATE: 1-4-94

TMS-EES-13-LY-01-94-02
 ATTACHMENT 2
 1 PAGE

ENGINEERED BARRIER - LARGE BLOCK EXPERIMENT SITE PREPARATION - PHASE I "VERTICAL DRILLING NAME AND SEQUENCE ILLUSTRATION"

- REFERENCE R1 JOB PACKAGE 93-10, "ENGINEERED BARRIER - LARGE BLOCK EXPERIMENT SITE PREPARATION - PHASE I"
- R2 WP 93-10, REV. 12/22/93, "LANL TEST COORDINATION OFFICE (TCO) FIELD WORK PLAN FOR ESF TESTING: ENGINEERED BARRIER - LARGE BLOCK EXPERIMENT SITE PREPARATION - PHASE I"



- = 3.81 cm (1.5" OD - IDENTIFIER: EX) CORE HOLES
- = 7.62 cm (3.0" OD - IDENTIFIER: NX) CORE HOLES

ALL HOLES CORED TO A TYPICAL DEPTH OF 6 m (20') BELOW THE SURFACE OF THE BLOCK VOLUME



DEPARTMENT OF ENERGY

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

WBS 1.2.9.2
QA: N/A

DEC 28 1993

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

OFFICE OF GEOLOGIC DISPOSAL WEEKLY HIGHLIGHTS FOR THE WEEK ENDING
DECEMBER 3, 1993 (SCP: N/A)

I. FORECAST SIGNIFICANT EVENTS

Site Characterization Activities

Exploratory Studies Facility (ESF)

Design activities will continue with submittal of the Package 2A drawings and specifications for U.S. Department of Energy (DOE) Acceptance Review. Complete verification of the Basis for Design (BFD) for Package 1B. Continue design activities for Packages 1C, 2B, and 2C.

Complete pull testing of pattern bolts in the starter tunnel. Excavation of the test alcove will resume based on the outcome of the U.S. Geological Survey (USGS) inspection.

Construction will continue on the 69kVA power distribution system with the continuation of trenching for duct banks on the pad and the beginning of fabrication and installation of the duct banks.

Continue placement of bedding sand in the trench and installation of the pipe for the water line.

Surface-Based Testing

Coring will continue at NRG-7/7A. Evaluation of conditions in USW UZ-14 will continue and a plan for completion of the borehole will be finalized. Borehole gas permeability testing will continue at UE-25 UZ-16. Drilling of test instrumentation holes will continue at the Large Block Experiment. Excavation of new trenches on the Bow Ridge and Paintbrush Canyon Faults will begin. Seismic reflection testing west of Exile Hill and borehole geophysical logging in the NRG boreholes will be completed.

II. CRITICAL ITEM STATUS - YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT (YMP)

A. Site Characterization Activities

ESF

Construction

Excavation on the test alcove was suspended late in the week to allow USGS to inspect the test alcove to determine whether it should be deepened or its direction changed to extend it beyond the shear zone which was encountered. Continued pull testing of pattern bolts in

DEC 28 1993

the starter tunnel. The face of the test alcove is at 27.4 meters (00+90 feet), measured from the centerline of the starter tunnel, as of December 3, 1993.

Construction is continuing on the 69kVA power distribution system with the beginning of trenching for the duct banks on the pad. Installed transformer (on loan from Nevada Power Company) for 69kVA electrical power on the concrete foundation at the North Portal Pad.

Completed excavation of the trench for the water line from Well J-13 to the Booster Pump Station. Continued placement of bedding sand in the trench. Began installing the pipe for the water line in the trench.

The following milestone represents the near-term plan for ESF activities:

69kVA power available at the North Portal	January 11, 1994
--	------------------

Design

Design activities continued on Packages 1B and 2A. Performing verification of Package 1B BFD. Completed verification of Package 2A and submitted drawings and specifications to the Civilian Radioactive Waste Management System Management and Operating Contractor (CRWMS M&O) Change Control Board for baselining. Continuing design activities for Packages 1C, 2B, and 2C.

Surface-based testing progress is summarized as follows:

<u>Borehole</u>	<u>Current Core Depth 12/03/93</u>	<u>Current Ream Depth 12/03/93</u>	<u>Total Planned Depth</u>
UZ-14	1,442.1 feet	1,421.6 feet	2,000 feet
NRG-7/7A	647.0 feet	302.1 feet	1,445 feet

On UZ-14, cement slurry was emplaced in the borehole on November 30, 1993, in a further attempt to shut out perched water. Plans for continued coring of the borehole to its planned depth of approximately 2,000 feet after the cement cures are under discussion.

On NRG-7/7A, a directional deviation survey was conducted at 637 feet to ensure that the hole will not enter the planned ESF north ramp opening.

Two Job Package (JP) authorizations were issued by the Site Manager: JP 94-01, Quaternary Faulting Within the Site Area: Alice Ridge Trenches; and JP 94-02, Trenching on the West Site of Exile Hill.

On JP 93-12, Ghost Dance Fault Roadcuts, cleaning, exposing, and mapping of the fault is expected to be completed. An acceptance meeting was held on December 2, 1993.

On JP 93-13, SD-12 Drill Pad and Access Road, grading continues on the pad with the drill pad approximately 80 percent complete. The access road is approximately 85 percent complete.

DEC 28 1993

On JP 92-3, UZ-16, air permeability testing is in progress.

On JP 93-11, C-Well Testing, packers are being installed in Well C-2.

On C-Hole Complex Multiple-Well Hydraulic Interference Testing, Phase I, testing began in UE-25 c#3. Emplacement of a string of three packers is in progress at UE-25 c#2 in preparation for testing.

On Seismic Reflection Testing - Bow Ridge Fault (Exile Hill), seismic reflection testing is in progress to aid in mapping volcanic stratigraphy beneath alluvium.

Geophysical logging is in progress for all of the completed NRG boreholes.

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

SCP ACTIVITY	TITLE	COMMENTS
8.3.1.3.2.1	Mineralogy, Petrology & Rock Chemistry of Transport Pathways	Outcrop sampling
8.3.1.3.2.2	Mineralogic & Geochemical Alteration	Outcrop sampling
8.3.1.4.2.2	Structural Features within Site Area	Surface mapping, ESF mapping
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	Test pits, trenching, ramp exploration holes
8.3.1.17.4.2	Location & Recency of Faulting Near Prospective Surface Facilities	Trench mapping
8.3.1.17.4.3	Quaternary Faulting within 100 km of Yucca Mountain, Nevada	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 mapping
8.3.1.2.1.1	Precipitation & Meteorological Monitoring for Regional Hydrology	Ongoing measurements
8.3.1.2.1.2	Runoff & Streamflow	Ongoing measurements
8.3.1.2.2.1	Unsaturated Zone Infiltration	Drilling/logging of neutron-access holes; ponding tests
8.3.1.2.2.2	Water Movement Tracer Tests	C1-36 measurements
8.3.1.2.2.3	Percolation in Unsaturated Zone	UZ drilling/testing Perched water testing
8.3.1.2.2.4	Characterization of YM Percolation in UZ-ESF Investigation	Perched water
8.3.1.2.2.6	Gaseous Phase Movement in Unsaturated Zone	UZ drilling/testing
8.3.1.2.2.7	Unsaturated Zone Hydrochemistry	UZ drilling/testing

DEC 28 1993

SCP ACTIVITY	TITLE	COMMENTS
8.3.1.2.3.1	Site Saturated Zone Groundwater Flow System	Ongoing monitoring
8.3.1.2.3.2	Saturated Zone Hydrochemistry	Ongoing sampling
8.3.1.15.1.8	In Situ Design Verification	Construction monitoring/testing

Environmental Safety and Health Programs

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

An overview of the Environmental Program's fiscal year (FY) 1993 accomplishments and FY 1994 initiatives was presented to representatives of the Edison Electric Institute (EEI).

The 1992 Annual Meteorological Data Summary Report was distributed, allowing all participants access to qualified and validated meteorological data collected for the 1992 calendar year.

The implementation of reclamation trials at Reclamation Site #1 was completed.

Large Block Test

Six of seventeen planned instrumentation holes have been drilled in the test block of Topopah Spring welded tuff.

Regulatory Interactions

Nuclear Waste Technical Review Board (NWTRB) Interactions

The Environment and Public Health Panel of the NWTRB met in Las Vegas, Nevada, on November 22, 1993, to discuss the status of the YMP terrestrial ecosystem program. The next NWTRB meeting will be held January 11-12, 1994, in Arlington, Virginia. A dry run for the performance assessment (PA) presentations will be held in Las Vegas on December 7, 1993.

Site Characterization Progress Report (PR)

Comments have been received on the review draft of PR 9. Due to the volume of comments received, it will not be possible to produce a final concurrence copy in one week for delivery to DOE/Headquarters (HQ) on December 3, 1993, for RW/DOE concurrence. Delivery to DOE/HQ is anticipated on December 9 or 10, 1993.

Technical Analysis

Technical Analysis Branch staff attended the semiannual meeting of the International Program Coordinating Group (IPCG) in Denver, Colorado, on December 1, 1993. The IPCG reviews work ongoing in the Office of Civilian Radioactive Waste Management (OCRWM) international program and integrates this work with the YMP studies. The IPCG plans a workshop on site characterization, design, and PA in the spring of 1994.

DEC 28 1993

The PA staff is evaluating the scope of potential PA contributions to the synthesis of various predictions of geological/hydrogeological/geophysical properties at the location of the planned Borehole SD-9.

The PA staff provided a preliminary waste isolation evaluation concerning the use of diesel support equipment (one diesel train) for operation of the tunnel boring machine to excavate the north ramp up to the first turn. Using the same approach used previously for the entire construction, it is expected that the amount of diesel exhaust generated from this portion of the excavation should not have adverse impacts on waste isolation.

The PA staff was consulted concerning the possible use of pressure grouting to stop the flow of perched water into UZ-14. The staff believes this technique may create open fractures behind the borehole wall between the perched water zone and underlying unsaturated zones. Borehole UZ-14 is located in a potential repository expansion area just north of the conceptual perimeter drift boundary, and the perched water zone is believed to be about 750 feet above the water table. The increased flow of perched water into the underlying zone may impact waste isolation performance by creating a zone of higher water saturations and greater effective hydraulic conductivity between potential waste package emplacement areas and the water table. Therefore, use of pressure grouting was not recommended.

The PA staff has written a summary on the thermal calculations being carried out with Finite Element Heat and Mass (FEHM). The summary outlines the important features of FEHM as a computational tool for near-field hydrothermal analysis, its current state of testing, required modifications, and the future analysis to be performed by the PA modeling group.

Site Characterization Plan/Study Plan (SP) Status

The U.S. Nuclear Regulatory Commission (NRC) has completed its initial review of SP 8.3.1.8.2.1, "Analysis of Waste Package Rupture Due to Tectonic Processes and Events." No new SPs were approved by the Yucca Mountain Site Characterization Project Office (YMPO) this week.

STUDY PLAN BREAKDOWN

	Initial Plans	Major Revisions
Not Submitted to YMPO.....	38	0
In Screening Review	0	0
In YMPO Review	0	1
Awaiting Comment Resolution	4	2
In Verification Audit	5	1
Awaiting YMPO Approval	0	1
Awaiting Submission to NRC	0	0
Awaiting NRC Initial Review	8	5
Accepted by NRC	49	5
<hr/>		
Totals	104	15
Total Submitted to NRC	57	10

State of Nevada Comments Status:

Received Comments from the State of Nevada..... 25
 Responses Transmitted to the State of Nevada 19

NRC Comments Status:

Received Comments from NRC 28
 Responses Transmitted from DOE to NRC 24

B. Quality Assurance Implementation

No significant activities to report.

III. GENERAL INFORMATION ITEMS

Participated in Strategic Planning session November 29-30, 1993, in Washington, D.C.

Participated in EEI review of YMPO activities and provided a presentation on DOE activities related to Section 801 of the Energy Policy Act December 1-3, 1993, in Las Vegas.

Participated in Joint NRC/DOE Multi-Purpose Canister and Burnup Credit Technical Exchange Number 1 in Bethesda, Maryland, November 30-December 1, 1993.

Participated in the Symposium on Safety in Underground Construction and Operations of the ESF by the National Research Council Geotechnical Board, U.S. National Committee on Tunneling Technology in Las Vegas, November 29-December 1, 1993.

Attended NRC meeting with Nuclear Management Resources Council Group to discuss 10 Code of Federal Regulations (CFR) 100, Appendix A.

Regarding Work Breakdown Structure 1.2.2.3.1.1 (Waste Form Testing - Spent Fuel), the draft Lawrence Livermore National Laboratory/Pacific Northwest Laboratories report on the Thermogravimetric Apparatus high temperature oxidation performance of spent fuel is almost complete. X-ray diffraction analyses were performed on a 185 milligram (mg) fragment of BWR (ATM-105) fuel that was oxidized at 283 degrees Celsius (C) for 793 hours to a final oxygen-to-metal ratio of 2.79 and on a 194 mg fragment that was oxidized at 325 degrees C for 120 hours to a final oxygen-to-metal ratio of 2.73. In both cases, the analysis indicates almost complete conversion to U₃O₈ with only a small amount of U₄O₉ remaining.

DEC 28 1993

David Vaniman of Los Alamos National Laboratory (Los Alamos) reported that collection of X-ray diffraction data was completed this week for all samples from drill core UE-25 UZ-16. Data analysis is ongoing and will be completed in early 1994. Results of this analysis will be published in 1994, including an assessment of trend in mineral occurrences and abundances that are important for the evaluation of sorption, past and future water-rock interactions, and thermal loading at the Yucca Mountain site.

The SP for Mineralogy, Petrology, and Chemistry of Transport Pathways (SP 8.3.1.3.2.1) was revised, taking into account the most current information on core and on ESF sampling adjacent to the Yucca Mountain site.

Members of the Los Alamos Sorption task obtained fractured material from the ESF and used these samples to investigate whether the retardation of radionuclides by the minerals in the fractures is different from the retardation provided by the tuff matrix. This material was separated into three components: two fracture fill components and the tuff matrix. Preliminary X-ray diffraction analysis indicated that one fracture fill sample is essentially pure quartz, and a large fraction of the second is calcite. Neptunium sorption experiments on these materials showed bulk permeabilities (K_d) near 1 for the quartz material and slightly higher K_d s for the tuff. Significantly higher K_d s were observed for the calcite-rich material. These observations are consistent with single mineral studies and K_d measurements on nonzeolitic tuff. This result is important because it seems to indicate that batch sorption coefficients obtained with the mineral phases that predominate in the fractures could be used to predict the transport of radionuclides in fractured tuff.

Preparations are underway to retire the Calma/IGIS VAX 3600 on December 8, 1993. The Calma thermal/mechanical models are being developed in Las Vegas as a part of the GENESIS system. The system will be moved to a temporary location for use by the flow laboratory staff. Calma products will no longer be supported after that date so work is in progress to complete all remaining Calma products.

On rock characteristics, the USGS continued to work on isopach and structural maps on the Tiva Canyon and Topopah Spring Tuffs, and digitized this information into the computer model data base. Petrographic studies also continued on thin sections from the lower portion of the Tiva Canyon Tuff. The USGS selected stratigraphic contacts in drill core from USW UZN-32, USW UZN-34 and USW UZN-37, and revised the lithologic logs of Boreholes UE-25 NRG-1 and UE-25 NRG-6. The USGS underground mapping personnel inspected Test Alcove #1 in the ESF this week and determined that the tunnel is not yet through the shear zone. Several more blast rounds will be required.

IV. PUBLIC OUTREACH AND INSTITUTIONAL ACTIVITIES

Tours to Yucca Mountain were conducted on November 29, 1993, for three guests of the Japanese Radioactive Waste Management and for 29 guests of the National Academy of Sciences (NAS), Tunnel Technology Committee. A tour was also conducted on November 30, 1993, for 20 guests of EEI.

DEC 28 1993

Several general YMP overviews were given. These included presentations on November 29, 1993, to 20 students at Community College of Southern Nevada in Las Vegas; to guests of the Symposium on Safety on November 30, 1993, in Las Vegas; to 70 members of the Carson City Rotary Club in Carson City, Nevada, on November 30, 1993; to 30 students of Navajo Community College on December 2, 1993, in Shiprock, New Mexico; and presentations to members of the American Nuclear Society in Phoenix, Arizona, on December 2, 1993; and to 30 guests of G. C. Wallace Engineers and Architects in Las Vegas, on December 3, 1993.

Several educational presentations were also given. These included presentations on fossils on November 29, 1993, to 25 students at Beatty Elementary School in Beatty, Nevada; on transportation on November 30, 1993, to 30 guests of the Fremont Rotary Club in Las Vegas; and presentations on volcanoes on November 30, 1993, to 18 students at Clarence A. Piggot Elementary School and to 28 students at William R. Lummis Elementary School in Las Vegas.

The Yucca Mountain Speaker Series presented "An Archaeological Guide Through the Ages," by Dr. William G. Johnson of the Desert Research Institute on November 30, 1993, at the Las Vegas Yucca Mountain Science Center (YMSC), and on December 2, 1993, at the Pahrump YMSC. The subject of the presentations was various archaeological sites at the Nevada Test Site and Yucca Mountain. In addition, Dr. Johnson looked at what future generations will think of us when they are examining the remains of our century. Approximately 30 people attended these lectures.

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 Jacqueline Brandt at (702) 794-7896 or Theresa Hirsch at (702) 794-7759 for additional information. Exhibits are coordinated by Joanna Magruder at (702) 794-7056, Public Update Meetings are coordinated by Jamie Elliott at (702) 794-7496, and Tours are coordinated by Carleen Hill at (702) 794-7375 or Kelly Doyle at (702) 794-7133.

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>YMPO Contact</u>
A. <u>Stakeholders Meetings</u>			
No significant meetings to report.			
B. <u>DOE/HQ Meetings</u>			
Tuesday, December 7	OCRWM Director's Program Review	Video- conference	R. Nelson
C. <u>CRWMS M&O/DOE Meetings</u>			
Tuesday, December 21	CRWMS M&O Program Management Review	Video- conference	R. Nelson

DEC 28 1993

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>YMPO Contact</u>
D. <u>Internal and DOE/Nevada Operations Office Meetings</u>			
Thursday, December 16	Technical Project Officers Meeting	Las Vegas, NV	R. Nelson
Thursday, December 16	Planning and Budget Meeting	Las Vegas, NV	R. Nelson
E. <u>NRC Interactions</u>			
Wednesday, December 8	NRC Technical Meeting on ESF Update and Status	Washington, DC	T. Bjerstedt
Tuesday - Wednesday, February 1-2, 1994	NRC Technical Exchange and Site Visit on Erosion TR Related Topics	Las Vegas, NV	T. Bjerstedt
Wednesday, February 9, 1994	NRC Technical Meeting on ESF Status	Rockville, MD	T. Bjerstedt
Tuesday - Wednesday, February 15-16, 1994	NRC Technical Exchange on Status on Work Relevant to Characterization of Saturated and Unsaturated Flow	Denver, CO	T. Bjerstedt
Tuesday - Thursday, May 3-5, 1994	NRC Site Visit: Surface-Based/ Underground Site Characterization Activities	Yucca Mountain, NV	T. Bjerstedt
Tuesday, May 17, 1994	NRC Meeting on Interactions Scheduling	TBD	T. Bjerstedt
Thursday, May 26, 1994	NRC Technical Meeting on ESF Status and Update	Rockville, MD	T. Bjerstedt
Monday - Tuesday, June 20-21, 1994	NRC Technical Exchange on Total System PA	Rockville, MD	T. Bjerstedt
Tuesday - Thursday, July 26-28, 1994	NRC Interactions: Topic TBD	TBD	T. Bjerstedt

DEC 28 1993

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>YMPO Contact</u>
E. <u>NRC Interactions</u> (Continued)			
Tuesday - Thursday, August 23-25, 1994	NRC Interactions: Topic TBD	TBD	T. Bjerstedt
Tuesday - Thursday, September 13-15, 1994	NRC Interactions: Topic TBD	TBD	T. Bjerstedt
Tuesday - Thursday, October 25-27, 1994	NRC Interactions: Topic TBD	TBD	T. Bjerstedt
Monday - Wednesday, November 7-9, 1994	NRC Interactions: Topic TBD	TBD	T. Bjerstedt
Tuesday - Thursday, December 6-8, 1994	NRC Interactions: Topic TBD	TBD	T. Bjerstedt
F. <u>NWTRB Interactions</u>			
Tuesday- Wednesday, January 11-12, 1994	NWTRB Full Board Meeting (P)	Arlington, VA	J. Nesbit
Tuesday- Wednesday, March 8-9, 1994 (Tentative)	NWTRB - SG&G Panel (P)	TBD	J. Nesbit
Monday- Wednesday, April 11-13, 1994	NWTRB Full Board Meeting (P)	Reno, NV	J. Nesbit
Monday- Wednesday, July 11-13, 1994	NWTRB Full Board Meeting (P) (Tentative)	Denver, CO	J. Nesbit
Wednesday- Friday, October 12-14, 1994	NWTRB Full Board Meeting (P) (Tentative)	Las Vegas, NV	J. Nesbit

DEC 28 1993

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>YMPO Contact</u>
G. <u>Advisory Committee on Nuclear Waste (ACNW) Interactions</u>			
Monday, December 13	ACNW 59th Meeting (P)	Las Vegas, NV	A. Gil
Tuesday, December 14	ACNW Working Group on Unsaturated Zone Hydrology (P)	Las Vegas, NV	A. Gil
Wednesday, December 15	ACNW Site Tour at Yucca Mountain (P)	Las Vegas, NV	A. Gil
H. <u>NAS Interactions</u>			
Thursday- Friday, December 16-17	NAS Committee on Yucca Mountain Standards (P)	Washington, DC	S. Jones
Monday- Tuesday, February 7-8, 1994	NAS Committee on Yucca Mountain Standards (P)	TBD	S. Jones
Thursday- Friday, April 28-29, 1994	NAS Committee on Yucca Mountain Standards (P)	TBD	S. Jones
<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>Speaker</u>
I. <u>State and Public Interactions</u>			
Monday, December 6	Pretour Briefing, Stoller Corporation - General Overview	Las Vegas, NV	M. Blanchard
Monday, December 6	George Harris Elementary School - Yucca Mountain Johnny	Las Vegas, NV	J. Hartley
Monday, December 6	Nevada Business Services - Job Opportunities	Las Vegas, NV	TBD
Wednesday, December 8	Court Continuation School - Native American Culture	Las Vegas, NV	R. Arnold
Thursday, December 9	Las Vegas Breakfasters Lions Club - Earthquakes	Las Vegas, NV	J. Savino

DEC 28 1993

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>Speaker</u>
I. <u>State and Public Interactions (Continued)</u>			
Friday, December 10	Fay Herron Elementary School - Native American Culture	Las Vegas, NV	R. Arnold
Saturday, December 11	Girl Scouts - Geology Merit Badge Workshop	Las Vegas, NV	Various
Tuesday, December 14	K. O. Knudson Middle School - Mineral Resources	Las Vegas, NV	J. Peck
Tuesday, December 14	Roy Martin Junior High School - Mining	Las Vegas, NV	M. Pitterle
Wednesday, December 15	Pahrump Fifth & Sixth Grade Center - Native American Culture	Pahrump, NV	R. Arnold
Thursday, December 16	Green Valley High School - Career as Engineer on YMP	Henderson, NV	D. McKenzie
Thursday, December 16	Mt. Charleston Elementary School - Native American Culture	Mt. Charleston, NV	G. Fasano R. Arnold
Friday, December 31	Widowed Persons Group - General Overview	Las Vegas, NV	J. Peck
Wednesday, January 12, 1994	Red Rock Visitors' Center - Native American Culture	Red Rock, NV	R. Arnold
Friday, January 14, 1994	Fay Herron Elementary School - "Gee Whiz Science"	Las Vegas, NV	J. Blink
Saturday, January 15, 1994	Amargosa Valley Girl and Boy Scouts - Geology Workshop	Las Vegas, NV	TBD
Tuesday, January 18, 1994	Roy Martin Junior High School - Botany	Las Vegas, NV	K. Wirtz

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>Speaker</u>
I. <u>State and Public Interactions</u> (Continued)			
Tuesday, January 18, 1994	4-H T.E.C. - Native American Culture	Las Vegas, NV	R. Arnold
Wednesday, January 19, 1994	Roy Martin Junior High School - Native American Culture	Las Vegas, NV	R. Arnold
Thursday, January 20, 1994	4-H T.E.C. - Native American Culture	Las Vegas, NV	R. Arnold
Friday, January 21, 1994	Nevada Regional Science Bowl - Training	Las Vegas, NV	TBD
Friday, January 21, 1994	Johnson Junior High School - "Gee Whiz Science"	Las Vegas, NV	J. Blink
Tuesday, January 25, 1994	Green Valley High School Key Club - General Overview	Las Vegas, NV	A. Robison
Tuesday, January 25, 1994	Yucca Mountain Speaker Series(P) - "Constructing a Tunnel to Study a Mountain"	Las Vegas, NV	D. McKenzie J. Peck
Thursday, January 27, 1994	Yucca Mountain Speaker Series(P) - "Constructing a Tunnel to Study a Mountain"	Las Vegas, NV	D. McKenzie J. Peck
Saturday, January 29, 1994	Amargosa Valley Girl and Boy Scouts - Geology Field Trip	Las Vegas, NV	TBD
Friday- Sunday, February 11-13, 1994	1994 Nevada Regional High School Science Bowl	Las Vegas, NV	E. Harle
Saturday, February 12, 1994	Girl Scouts - Geology Merit Badge Workshop	Las Vegas, NV	Various

DEC 28 1993

<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>Speaker</u>
I. <u>State and Public Interactions</u> (Continued)			
Tuesday, February 22, 1994	Yucca Mountain Speaker Series (P) - "Fossils Tell a Story"	Las Vegas, NV	A. Gil
Thursday, February 24, 1994	Yucca Mountain Speaker Series (P) - "Fossils Tell a Story"	Las Vegas, NV	A. Gil
Sunday, February 27, 1994	Waste Management Symposia - TBD	Tucson, AZ	TBD
Monday- Saturday, February 28- March 12, 1994	JASON Project - "Rain Forest"	Las Vegas, NV	E. Harle
Sunday, March 20, 1994	Risk Management Quarterly Association - TBD	San Diego, CA	TBD
Sunday, March 27, 1994	Yucca Mountain Speaker Series (P) - "Desert Beauties - Spring Flowers"	Pahrump, NV	K. Wirtz
Tuesday, March 29, 1994	Yucca Mountain Speaker Series (P) - "Desert Beauties - Spring Flowers"	Pahrump, NV	K. Wirtz
Saturday, April 2, 1994	Girl Scouts - Geology Merit Badge Workshop	Las Vegas, NV	Various
Tuesday, April 5, 1994	Science and Mountains Teacher Workshop	Las Vegas, NV	E. Harle
Thursday, April 7, 1994	Science and Mountains Teacher Workshop	Las Vegas, NV	E. Harle
Monday, April 11, 1994	Critical Thinking Teacher Workshop	Las Vegas, NV	E. Harle
Tuesday, April 12, 1994	Science and Mountains Teacher Workshop	Las Vegas, NV	E. Harle

DEC 28 1993

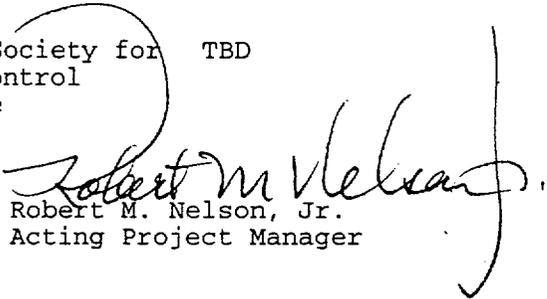
<u>Date</u>	<u>Event</u>	<u>Location</u>	<u>Speaker</u>
I. <u>State and Public Interactions</u> (Continued)			
Thursday, April 14, 1994	Critical Thinking Teacher Workshop	Las Vegas, NV	E. Harle
Saturday, April 16, 1994	Critical Thinking Teacher Workshop	Las Vegas, NV	E. Harle
Saturday, April 16, 1994	Science and Mountains Teacher Workshop	Las Vegas, NV	E. Harle
Monday, April 18, 1994	Critical Thinking Teacher Workshop	Las Vegas, NV	E. Harle
Sunday, April 24, 1994	Yucca Mountain Speaker Series (P) - "Eating Your Way Through a Mountain"	Pahrump, NV	L. Destwolinski
Tuesday, April 26, 1994	Yucca Mountain Speaker Series (P) - "Eating Your Way Through a Mountain"	Pahrump, NV	L. Destwolinski
Tuesday, May 31, 1994	LESSON Teacher Workshop - Science Workshop	Las Vegas, NV	TBD
Saturday, June 4, 1994	Girl Scouts - Geology Merit Badge Workshop	Las Vegas, NV	Various
Sunday, June 12, 1994	Southeast Area Regulatory Utility Commissioners Conference - TBD	Charleston, SC	TBD
Monday, June 13, 1994	LESSON Teacher Workshop - Science Workshop	Las Vegas, NV	TBD

DEC 28 1993

<u>Date</u>	<u>Event</u>	<u>Location</u>
J. <u>Exhibits Scheduled</u>		
Saturday, December 4	Public Open House (P)	Yucca Mountain, NV
Monday- Friday, December 6-10	American Geophysical Union	San Francisco, CA
Monday- Friday, December 13-17	Migration '93	Charleston, SC
<u>Date</u>	<u>Event</u>	<u>Escorts</u>
K. <u>Tours Scheduled</u>		
Saturday, December 4	Public Open House (P)	Various Escorts
Monday, December 6	Stoller Corporation	TBD
Tuesday, December 7	National Nuclear Safety Administration - China	TBD
Wednesday, December 8	Clark High School	TBD
Wednesday, December 8	Asahi Shimbun, Japanese Media	S. Richardson
Wednesday, December 15	ACNW	A. Gil
Thursday, December 16	Churchill County	C. Binzer
Wednesday, December 22	TRW Systems Integration Group	TBD
Thursday, January 6, 1994	Inyo County	TBD
Tuesday, January 11, 1994	Amargosa Middle School	TBD
Wednesday, January 12, 1994	YMP Orientation Tour	A. Stephenson

DEC 28 1993

<u>Date</u>	<u>Event</u>	<u>Escorts</u>
K. <u>Tours Scheduled</u>	(Continued)	
Saturday, January 22, 1994	Public Open House (P)	Various Escorts
Friday, February 4, 1994	American Nuclear Energy Council	TBD
Saturday, February 26, 1994	Public Open House (P)	Various Escorts
Tuesday, March 8, 1994	St. Cloud State University (MN)	TBD
Saturday, March 19, 1994	Public Open House (P)	Various Escorts
Tuesday, March 29, 1994	W. Mac Lyon Middle School	TBD
Thursday, March 31, 1994	National Council, State Garden Club Specific Region Convention	TBD
Saturday, April 16, 1994	Public Open House (P)	Various Escorts
Wednesday, April 20, 1994	Cannon Junior High School	TBD
Thursday, April 28, 1994	Garside Junior High School	TBD
Thursday, May 19, 1994	Western High School	TBD
Monday, May 23, 1994	American Society for Quality Control Conference	TBD


Robert M. Nelson, Jr.
Acting Project Manager