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

Reply to:

301 E. Stewart Ave., #203
Las Vegas, NV 89101
Tel: (702) 388-6125

DATE: November 22, 1993

TO: Joseph Holonich, Director
Repository Licensing and Quality Assurance Project Directorate

FROM: Philip S. Justus, Sr. On-Site Licensing Representative, HLPD

SUBJECT: ON-SITE LICENSING REPRESENTATIVE'S REPORT ON YUCCA MOUNTAIN PROJECT FOR OCTOBER 1993

INTRODUCTION

During the fourteenth month as On-site Licensing Representative (OR), I participated in three site visits, a DOE/NRC Technical Exchange on ESF Design Control, a Nuclear Waste Technical Review Board Meeting on DOE's Testing Program and the Yucca Mountain Project (YMP) - Project Manager's/Technical Project Officer's (TPO) Meeting, among other activities. This report summarizes those activities that I consider particularly relevant to staff work.

A principal purpose of these OR reports is to alert NRC staff, managers and contractors to information from DOE's programs for site characterization, repository design, performance assessment and environmental studies that may be of use in fulfilling NRC's role during prelicensing consultation. Relevant information includes such things as new technical data, DOE's plans and schedules and the status of activities to pursue site suitability and Exploratory Studies Facility (ESF) development. In addition to communication of information, any potential licensing concerns identified are reported, as appropriate. The principal focus of this and future ORs reports will be on DOE's programs for ESF, surface-based testing (SBT), performance assessment, data management systems and environmental studies (at this time, mainly water resources).

EXPLORATORY STUDIES FACILITY (ESF)

1) DOE/NRC TECHNICAL EXCHANGE (TE) ON THE ESF. On 10/4-5, I participated in the TE held in Las Vegas the purpose of which was

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"to hold discussions on DOE activities related to the ESF design and design control process" (see Agenda, Enclosure 1). An official DOE/NRC meeting summary will be prepared and will contain the handouts. A complete set of handouts is on file in the ORs office. Some of the matters discussed at the TE will involve OR participation. These include: continuation of the Controlled Document library in the NRC Las Vegas office (NRC Office Automation Assistant, Nancy White, is now the NRC designated Controlled Document coordinator); design reviews including, but not limited to, 50% and 90%; periodic observation of the Change Control process; DOE's early notification of opportunities for NRC staff observation of DOE product acceptance reviews, e.g., field inspections; contuation of improvements in communication between DOE and NRC on DOE's proposed design ideas and changes.

2) DOE ACTIONS TO KEEP NRC INFORMED OF ESF DESIGN CONTROL PROCESS. At the TPO meeting, 10/29, Mr. T. Petrie, Dep. Div. Dir. Engineering and Development, DOE, described the communications and interactions between NRC and DOE on design control process - letter of 8/20/93, 9/17 DOE/NRC Management Meeting and 10/4-5 TE (see item 1, above). He listed five actions taken and proposed to gain NRC staff's confidence that the design process is being conducted properly and that the design is adequate:
-better inform NRC and enable it to observe the design process without severly impacting DOE;
-hold bi-monthly technical exchange meetings;
-continue informal weekly 'teleconferences' between NRC and ESF Branch Chief;
-develop plans to improve process for exchange of information such as Design Packages;
-provide NRC opportunities to observe DOE product acceptance process (i.e., acceptance reviews, inspections; Enclosure 2E).

3) OPPORTUNITIES TO OBSERVE DOE ACCEPTANCE REVIEWS IN FY94. The ORs were notified that in FY94 several Acceptance Reviews will be scheduled and NRC staff may observe them (see item 1, above). An Acceptance Review, in these cases, refers to DOE telling the constructor, REECo, that it has acceptably completed a particular component of the ESF. An Acceptance Review Procedure is to be issued around January 94. In the January-February timeframe, an Acceptance Review Package containing such things as required documents and drawings will be available. Prior to the end of March DOE expects to conduct Acceptance Reviews (AR) of the following Package 1A components: Starter Tunnel, Test Alcove #1 and, perhaps, the Topsoil Storage Pad. The ORs are to be kept informed of the FY94 AR milestones and schedules.

4) CONSTRUCTION OF TEST ALCOVE #1. Drilling and blasting of Alcove #1 was one of two significant ESF activities in October. Fibercreting of the corners was completed. Geologic mapping of a section near the entry was completed. Wire mesh was installed with split set rock bolts, no grout will be used in Alcove #1. By end

of October the Alcove had advanced about 40 ft from the ramp centerline. A decision by the geologist and hydrologist Principal Investigators (PIs) on when to complete alcove advance is expected to be made in later part of November, when a shear zone projected to be intersected by the Alcove has been peretrated. Testing will not begin, however, until the tracer gas injection system, needed for testing, is on-site, sometime in December. The relevant Study Plan activities are 8.3.1.2.2.4.4 and 8.3.1.2.2.4.8. The field test coordinator will notify the ORs of the impending decision point and test milestones. A proposed layout plan and section was distributed at the TRB meeting on 10/19 (see Enclosure 3). The next test alcove is not scheduled for construction until FY95 when the TBM encounters the Bow Ridge Fault.

5) CONSTRUCTION MONITORING ACTIVITIES (CMA). CMA was a second significant ESF activity in October. On 10/27 the ORs were briefed in the field on the implementation of DOE's CMA program for ESF operations in accordance with Study Plan 8.3.1.15.1.8, "In situ Design Verification" and Job Package 92-20D, Rev.0, "Construction Monitoring in the Starter Tunnel." CM tools being installed to detect rock instabilities include multi-point borehole extensometers (MPBX) in three boreholes, steel-tape extensometer anchors, and seismometers in boreholes. The ORs observed the locations of CM boreholes and anchor sites for each method, including the MPBX hole in the crown near the 200 ft. point. The MPBX boreholes will be about 45 ft. long; two will be vertical in the crown, one will be horizontal, perpendicular to the other two, in the south wall. The CMA PI and crew, Sandia National Labs contractors, demonstrated calibration tools and walked through their Scientific Notebook and methods for performing and documenting their scientific investigations. The ORs observed the PI to be using generally sound QA practices.

6) TRACERS, FLUIDS AND MATERIALS (TFM) TRACKING PROCESS. On 10/28, the ORs were briefed on the TFM evaluation and tracking process by the Los Alamos National Lab (LANL) TFM coordinator (this function has since been transferred to the M&O). The following is a summary of selected parts of the process: The TFM tracking process is based on a management plan, "Yucca Mountain Site Characterization Project Tracers, Fluids and Materials Management Plan," Rev.1, November 1992. The plan directs that evaluations be performed on TFM proposed to be used in the project: 1) importance to waste isolation evaluation (ITWI), 2) test interference evaluation (TIE), and 3) potential health effects on workers. ITWI and TIE are performed by the M&O and lead to a statement of potential impact/no impact/use with certain provisions. LANL TFM coordinator sends evaluation results to DOE Regulatory & Site Evaluation Division Director who authorizes the use, restricted use, or, may deny use of the TFM. Data on the kinds and quantities of TFM used are kept by LANL (to be kept by M&O), EG&G for the YMP database, SAIC on hazardous materials, REECo, the principal user in the field, and others, such as USGS-hydrology PIs. A user is given a limit on the

TFM quantity, such that if more is needed, another ITWI and TIE would be performed. The M&O makes the call on how much TFM, e.g., grout, is too much. The ORs will continue to report on the use of TFM.

7) STATUS OF TUNNEL BORING MACHINE (TBM) AND PROPOSED ESF ACTIVITIES FOR FY94. The main ESF activities for FY94 support the startup of the TBM (see Enclosure 2D). Much preparation is involved, including such things as installation of conveyor system, of electrical power, of compressed air system, and concrete liner to support the TBM's footers. YMPO announced at the TRB meeting, 10/19, that it plans to have the TBM up and running in place in August 94. Two shifts per day are budgeted. Thus, the TBM is expected to operate for about one month in FY94.
The front part of the TBM train is shown in Enclosure 4. Note that the geologic mapping platform is not closer than about 150 ft from the working face.

SURFACE-BASED TESTING (SBT)

1) NUCLEAR WASTE TECHNICAL REVIEW BOARD (TRB) MEETING. On 10/19-20 I attended the TRB meeting in Las Vegas on "Surface-based Dry Drilling/Underground Testing Program" (see Agenda, Enclosure 5). S. Jones pointed out to the TRB NRC's involvement in DOE's site characterization testing program in at least three areas - SCP and Study Plan reviews, and evaluation of test results. M. Chornack, USGS, described clearly the unsaturated zone characterization program details. Your presentation on NRC's views of DOE's design control process was well received. Refer to the NRC HQ staff's report of the meeting for a description of the contents. The handouts are on file in the OR office.

2) BOREHOLE UZ-14 STATUS. At the TRB meeting on 10/19, R. Luckey, USGS, summarized the results of activities at UZ-14. It has been concluded that the fluid in UZ-14 is the same as that from nearby UZ-1; that the fluid contains polymer used to drill G-1 in 1980; and that the nature of the fluid in UZ-14 is not known (see OR report for September for hypotheses). One of the hypotheses, the water is perched, may not be able to be conclusively demonstrated. The reason is that the G-1 water was taken from well J-13, completed in the Topopah Springs unit several miles away. If UZ-14 water is perched in the Topopah Springs unit, it would have a chemical signature similar to, perhaps indistinguishable from, the J-13 water introduced in G-1. Dr. Luckey speculated on the possibility that J-13 water with polymers from G-1 could have migrated within the footprint of the repository, based upon rough and preliminary calculations and assumptions regarding the shape and size of a G-1 plume. Also, J. Rousseau, USGS, indicated that the water temperatures are lower than expected. The LM-300 sampling system at UZ-14 was discussed by D. Williams at the TRB meeting (Enclosure 6) along with a comparison of drilling statistics for UZ-14 and UZ-16 (Enclosure 7).

3) STRATIGRAPHIC NOMENCLATURE FOR YMP TO BE FORMALLY REVISED. This is a heads up. The USGS, in collaboration with LANL, is redefining the stratigraphy of the entire Cenozoic volcanic section of the greater Nevada Test Site area. New terms will be established for rock stratigraphic units and published in the Geological Society of America Bulletin in late 1993 or early 1994. Radiometric ages of units will be published for the first time. Look for a USGS Open-file Report (OFR) on YM stratigraphic nomenclature to be published in 1994. The OFR and Bulletin article are designed to be compatible references for YM stratigraphy. The OFR will apparently include tables that indicate how the lithologic units are related to the thermo-mechanical and hydrologic units. Such correlation tables would be helpful in mitigating the confusion of stratigraphic terms applied to the same rock units by the various participants. The OFR would appear to overlap in scope the stratigraphic compendium that is under development by the M&O (see OR report for September 1993).

The USGS work in Forty-Mile Wash has been focusing on the outcropping Calico Hills (CH) rock unit stratigraphy and lateral lithologic variability. Results will be discussed at the International HLW Conference in Las Vegas in May 1994 (two published abstracts were sent to HQ staff on 10/12). The CH contains at least five lava flows, nine massive breccias and five bedded sequences where it is exposed in the Paintbrush Canyon area. However, in the north flank of YM, the CH apparently has one lava flow. It may not be obvious from an inspection of a borehole (BH) containing one lava flow as to which of several lava flows present in another BH the one flow may be correlated with, if any. Such lateral variation may have led the same subunits of the CH being given different names in different places. The ORs will continue to follow developments in this subject area.

4) GEOPHYSICAL TESTING PROGRAM: FY93 ACCOMPLISHMENTS, FY94 PLANS. At the TRB meeting, 10/19, D.Williams summarized the FY93 work and FY94 plans in geophysics in these categories: BH logging, seismic refraction, gravity and magnetics, geodetic leveling, earthquake monitoring, engineering geophysical testing. See Enclosure 8 for details. At TPO meeting, 10/29, S.Jones indicated that the seismic reflection surveying planned for FY94 can be expedited if REECo would drill the shotholes, rather than the seismic surveyor.

5) PNEUMATIC-TESTING PROGRAM. R. Craig, USGS, on 10/4 (DOE/NRC TE) and 10/20 (TRB) described the BH testing program to provide baseline data on gas and fluid flow characteristics along the ESF alignment in the undisturbed state (pre-ESF construction). In particular, nine BHs have been designated as key to establishing such measurements: USW NRG-6, UE-25a#4, UE-25 NRG-2b, UE-25 NRG-4, UE-25 NRG-5, USW UZ-7, USW UZ-14, USW SD-12 and USW SRG-4 (see map, Enclosure 9).

6) LARGE-BLOCK EXPERIMENT (LBE) AT FRAN RIDGE IS PROCEEDING. In October site preparation for the LBE continued. Controlled drilling and blasting to isolate the test block occurred. Apparently, LLNL considered that site preparation work need not be conducted under a QA program because of its prototype nature. Water used need not be traced or metered. A spill of about 2.5 gallons of hydraulic fluid occurred on or near the test block, but was considered by LLNL field rep to be satisfactorily cleaned. Excavation plan and section details were presented by D. Wilder, LLNL, at the TRB meeting, 10/20 (Enclosures 10A, plan view; 10B, cross section).

7) GHOST DANCE FAULT (GDF) STUDIES. On 10/21 Wm.Boyle, G.Stirewalt and I observed the GDF pavement at Antler Ridge. The west pavement clearly showed extensive brecciation. Lithphysae were scarce or absent. The east pavement was being cleared by hand. Water hoses, brooms and shovels were used to clean the pavement. There appeared to be a higher percent of non-brecciated tuff and lithophysae in the east pavement. It appears that the intensity and extent (width) of brecciation in the GDF zone at this locality is greater than expected from the existing descriptions of the zone. Such an observation raises questions about such things as the detectability of fault breccia from surface mapping at the scale used (how accurate is the mapped breccia), and about the reliability of projections of the GDF zone to repository depth at this early stage of understanding its characteristics (how accurate is the portrayal of the GDF at repository depth). The USGS has determined that the GDF zone needs further investigation; apparently funds are available for certain FY94 work. The ORs will continue to follow this activity.

8) NATURAL RESOURCES ASSESSMENT. At the TPO meeting, 10/29, Dr. Z.Peterman, USGS, discussed the plan to implement Study Plan 8.3.1.9.2.1, "Natural Resources Assessment of YM," in FY94. He identified two invaluable maps that should be obtained by reviewers. The USGS has already sampled gold mines in the Bare Mtn. area and will sample YM core. Dr. Peterman stated with confidence that the USGS could predict metal mineralization of marine carbonates, e.g., Paleozoic limestones such as those underlying YM, by determining the delta strontium87 values. His handout was sent earlier to NRC HQ staff (Enclosure 2G).

9) STATUS OF SBT. At the TPO meeting, S.Jones discussed the status of SBT activities. The following is selected from her discussion:
-C-well test. Continue site restoration and pad construction;
-Volcanism studies. Prof. G.Thompson, Stanford Univ., is reviewing geophysics support program; Study Plan 8.3.1.8.1.2 was submitted to NRC staff on 10/4;
-UZ-16. Air permeability tests to be conducted early November; walkaway vertical seismic profiling using grouted geophones planned for 5/94;
-Midway Valley report on geology due December 1993;

-Bare Mtn. Excavate five more test pits;
-GDF. Completed data collection across fault along line from WT-2 to UZ-16 for gravity, magnetics and shallow seismic reflection.

GENERAL

1) DOE, YMPO MANAGEMENT CHANGES AND REORGANIZATION PLAN ANNOUNCED. YMPO announced on 10/8 that Mr. C.Gertz accepted a 90-day detail to lead a task group of experts seeking to accelerate the Hanford Tank Wastes remediation program. Effective in mid-October, Dr. Russ Dyer would be Acting Project Manager; Dr. Susan Jones would be Acting Director of the Regulatory and Site Evaluation Division. At TPO meeting, 10/29, Ms. Smith reiterated that Dr. D.Dreyfus had been confirmed by the senate to head DOE/OCRWM and Mr. L.Barrett would be his principal deputy director. Also, she indicated that three options for reorganizing YMPO are under consideration by Mr. Dreyfus.

2) OCRWM DIRECTOR'S GOALS AND PRIORITIES FOR FY94. Mr. Dreyfus's FY94 goals and priorities were enumerated at the TPO meeting (Enclosure 2C):
-comply with all laws and regs;
-maximize prioritized scientific investigations essential to YM site suitability determination with balance between ESF, SBT and PA attendant to scientific investigations;
-enhance waste acceptance capability: continue to support MRS; optimize MRC for availability in 1998; pursue limited 1998 transportation capability;
-limit program support to essential for advancing waste acceptance objectives;
-support Secretary's program emphasizing stakeholder involvement.

3) YMPO PROJECT MANAGER'S GOALS AND PRIORITIES FOR FY94. R. Dyer's FY94 goals and priorities were enumerated at the TPO meeting (Enclosure 2C):
-continue ESF development
-continue ACD
-continue SBT
-continue environmental data
-continue ID/resolution of difficult technical issues
-continue development of standardized waste package
-continue to comply with regs and DOE orders
-continue to define and implement cost controls.

4) HANTAVIRUS RISK AT YM "VERY LOW." At the TPO meeting results of cooperative sampling and blood testing by Center for Disease Control, State of Nevada, Washoe County and EG&G/EM of 496 rodents near YM and 57 rodents on Paiute and Ranier Mesas were described. The YM rodents, including the few deer mice captured there, tested negative for hantavirus antibodies suggesting no exposure. Ten of the 57 rodents from northern end of NTS tested positive for hantavirus antibodies. All ten were deer mice. The antibody-positive mice apparently were all from elevations higher

than occur at YM. YMPO stated, "the risks for exposure at YM appears to be very low based on these tests."

5) YMPO DESCRIBES A BUDGET SCENARIO LEADING TO LICENSE APPLICATION (LA) SUBMITTAL IN CY2006. At the TPO meeting, and at other meetings in October, YMPO described a budget plan that would lead to a LA submittal to NRC in FY2005/CY2006 (Enclosure 2C) and still maintain a 2010 waste emplacement date. YMPO emphasized that other scenarios are possible which would lead to different outcomes. It appears unlikely to YMPO, with the current funding plan, that a LA will be submitted in 2001. However, YMPO insisted that, under certain budget scenarios and assumptions about YM candidate site, waste could be emplaced at YM in 2010, as currently projected. The LA in FY2005 scenario includes such assumptions as a doubling of funds in FY95 to $519M sustained at about that level for eight years, TBM is operational in FY94 and a second one purchased in FY95.

6) MONTHLY REPORTS PRODUCED BY DOE PARTICIPANTS ARE NOT QA DOCUMENTS. Note that data, analyses and other information provided in DOE participant's monthly reports have not been reviewed or approved by DOE. They are internal documents required of all DOE contractors by DOE Order 4700. As such, the monthlies should not be referenced as sources of significant data. Of course, they remain useful leads to data sources.

ON-SITE REP (OR) ACTIVITIES

1) APPENDIX 7 VISITS. The ORs arranged four Appendix 7 meetings in October: 10/6, Design Review Package 2A followup, DOE Las Vegas; 10/6 & 10/21, NRC HQ/CNWRA staff Site visit, YMP site; 10/18-19, NRC Global Positioning Satellite Research station measurements, YMP site.

2) NYE COUNTY/OR INTERACTION. On 10/21 NRC HQ and CNWRA staff and I visited the Nye County On-Site Rep's office at the Field Operations Center (FOC) and met N. Stellavato, Nye Co. OR, and L.Bradshaw. DOE and Nye Co. are negotiating a protocol by which Nye Co. can drill, sample and test on the YM site. This is of interest to NRC insofar as the results of the Nye Co. program are intended to be used by the Co. to become a well-informed participant in any future licensing proceeding. DOE discussed this matter at the TPO meeting.

3) PHOTOINDEX AVAILABLE FOR INSPECTION. YMPO has made available for perusal an index of photographs taken at the YM site. Browsing must be done at the FOC or in YMPO office. Request Johnson Control's "YMSO Photo Proofbook Reference."

4) NRC STAFF VISITORS. The following NRC staff visited the site

and/or attended meetings in Las Vegas in October: Wm. Belke. Wm. Boyle and J. Holonich, twice each; Wm. Ford; M. Nataraja; S-J. Chern; R. Ballard; Geo. Birchard (staff who attended the Licensing Support System Advisory Review Panel meeting 10/6-7 are not included).

Enclosures:

1.	DOE/NRC Technical Exchange Agenda		10/4-5
2A.	TPO Meeting	Agenda	10/29
2B.	" "	L. Smith Update	"
2C.	" "	R. Dyer Update	"
2D.	" "	T. Petrie ESF Status	"
2E.	" "	T. Petrie Results of TE	"
2F.	" "	S. Jones SBT Status	"
2G.	" "	Z. Peterman Nat.Res SP	"
3.	TRB Meeting	D. Williams Alcove #1 Plan and Section	10/19
4.	" "	N. Elkins North Ramp & TBM Profile	"
5.	" "	Agenda	"
6.	" "	D. Williams LM-300 Sampling at UZ-14	"
7.	" "	D. Williams UZ-16 vs UZ-14 Drilling Stats	"
8.	" "	D. Williams Geophysics FY93 Accompl, FY94 Plans	"
9.	" "	R. Craig BH Location Map for Accelerated Tests	"
10A.	" "	D. Wilder LBE Excavation Plan	"
10B.	" "	D. Wilder LBE Cross Section	"

cc w/encl: R. Nelson, DOE
D. Shelor, DOE
T. Hickey, State Senator
W. Patrick, CNWRA
R. Loux, State, Nuclear Waste Project Office

cc w/o encl: C. Abrams, M/S 4 H 3
R. Bernero, M/S 6 E 6
S. Gagner, M/S 2 G 5
J. Linehan, M/S 4 H 3
E. O'Donnell, M/S NLS 260
H. Thompson, 17 G 21
B. Youngblood, M/S 4 H 3
G. Cook, Region V
R. Dyer, DOE
A. Gil, DOE
T. Petrie, DOE
J. Martin, Region V
S. Jones, DOE
D. Foust, M&O
R. Leonard, M&O
S. LeRoy, M&O
J. Russell, CNWRA
L. Reiter, NWTRB
D. Bechtel, Clark Co.
L. Bradshaw, Nye Co.

ENCLOSURE 1

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SEP 14 1993

MEMORANDUM FOR: Joseph J. Holonich, Director
Repository Licensing and Quality Assurance
Project Directorate
Division of High-Level Waste Management

FROM: Charlotte Abrams, Senior Project Manager
Repository Licensing and Quality Assurance
Project Directorate
Division of High-Level Waste Management

SUBJECT: FORTHCOMING NUCLEAR REGULATORY COMMISSION/U.S. DEPARTMENT OF ENERGY (DOE) TECHNICAL EXCHANGE ON THE EXPLORATORY STUDIES FACILITY*

DATES: October 4 and 5, 1993

TIME: 8:00 a.m. - 5:00 p.m.

LOCATION: San Tropez Hotel Convention Center
455 E. Harmon Ave.
Las Vegas, Nevada
(702) 369-5400

PURPOSE: To hold discussions on DOE activities related to the Exploratory Studies Facility design and design control process. See enclosed agenda.

PARTICIPANTS:

NRC	DOE	State of Nevada
C.Abrams	C.Einberg	C.Johnson
J.Holonich	T.Petrie	
R.Ballard		

* Meetings and technical exchanges between NRC and DOE are open to members of the public, Petitioners, intervenors, or other interested parties wishing to attend as observers pursuant to the spirit of "Open Meeting Statement of NRC Staff Policy," 43 Federal Register 28058, dated June 28, 1978, which details the open meeting policy for applicants and licensees.

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Affected Local Governments

M. Murphy, Nye County, NV
D. Bechtel, Clark County, NV
V. Poe, Mineral County, NV
C. Schank, Churchill County, NV
R. Williams, Lander County, NV
B. Mettam, Inyo County, CA
M. Baughman, Lincoln County, NV
F. Sperry, White Pine County, NV
P. Niedzielski-Eichner, Nye County, NV
L. Fiorenzi, Eureka County, NV
J. Hoffman, Esmeralda County, NV
L. Bradshaw, Nye County, NV

Charlotte Abrams

Charlotte E. Abrams, Senior Project Manager
Repository Licensing and Quality Assurance Project Directorate
Division of High-Level Waste Management

Enclosure: As stated

cc: S. Goldberg, OMB
D. Weigel, GAO
F. Parker, NAS
W. Barnard, NWTRB
A. Kadak, YAEC
R. Newlin, OPA

AGENDA
U.S. DEPARTMENT OF ENERGY - U.S. NUCLEAR REGULATORY COMMISSION
TECHNICAL EXCHANGE ON EXPLORATORY STUDIES FACILITY
October 4-5, 1993
San Tropez Hotel Convention Center
455 E. Harmon Ave.
Las Vegas, NV
8:00 a.m. - 5:00 p.m.

October 4, 1993

Opening remarks	DOE, NRC, STATE OF NV. AFFECTED COUNTIES
NRC/OCRWM COMMUNICATIONS Site Characterization Program Baseline Semiannual Progress Report (PR 6&7 C2) NRC On-Site Licensing Representatives ESF Design Reviews Technical Exchanges Suggestions for improving communications	DOE
DESIGN STRATEGY Background Option 30 and Modified Option 30 Title I Design Summary Report ESF Technical Baseline Modifications to Title I Baseline and Control Process Connection to Title II Design	DOE
BREAK	
DESIGN/CONSTRUCTION PROCESS AND DESIGN CONTROL IMPROVEMENT PLAN	DOE
PROPOSED ESF DESIGN CHANGES	DOE
LUNCH	
DESIGN/CONSTRUCTION PLAN Phases Design and Construction Sequence Surface Subsurface	DOE

DOE REQUIREMENTS HIERARCHY THROUGH ESFDR (SCA 130C) — DOE
- Document Description - Old/New
- Transition Plan

ARCHITECT/ENGINEER REQUIREMENTS HIERARCHY — DOE
- Transition RSN/M&O
- Basis for Design

BREAK

DETERMINATION OF IMPORTANCE EVALUATIONS — DOE
- Q-List (PR 6&7 C3)
- Importance to Safety
- Importance to Waste Isolation
- Importance to Test Interference
- Analyses That Have Been Completed

October 5, 1993

SELECTED DESIGN ISSUES

- ESF VENTILATION IMPACT ON TESTING (SCA 123C and PR 6&7 Q1) — DOE
- FIRE SUPPRESSION — DOE
- IMPACT OF UNDERGROUND DIESEL EMISSIONS IN ESF — DOE
- RESULTS OF ESF TECHNICAL ASSESSMENT FOR SEISMIC DESIGN BASIS (SCA 121C) — DOE
- ROOF BOLTS AND GROUND CONTROL OPTIONS — DOE

BREAK

- ESF WATER STORAGE TANKS, WASTE LAGOON, AND SEPTIC FIELD (SCA 55Q) — DOE
- FLEXIBILITY OF ESF TO ACCOMMODATE IN SITU TESTING OF WASTE PACKAGE (SCA 58Q) — DOE

LUNCH

DESIGN INTERFACES — DOE
- ESF/Geologic Repository Operation Area Interfaces
- Connectivity Between Waste Package, Repository Alternative Conceptual Designs, and ESF
- Surface Based Testing/Underground Test Interfaces

CONSTRUCTION STATUS Construction, Construction Inspections, and Title III Inspections (Items Important to Safety, Waste Isolation, and Test Interference) Inspection Documents Photographs	DOE
BREAK	
OPEN DISCUSSION	ALL
CLOSING REMARKS	DOE, NRC, STATE OF NV, AFFECTED COUNTIES
ADJOURN	

NOTE: TIME WILL BE ALLOTTED FOR DISCUSSION FOLLOWING EACH AGENDA TOPIC

ENCLOSURE 2A

(Rev. 0, 10/15/93)

AGENDA

YUCCA MOUNTAIN PROJECT - PROJECT MANAGER'S/TPO MEETING

OCTOBER 29, 1993, FRIDAY

SAIC CONFERENCE ROOM 450

TIME	WHAT	WHO	EXPECTED OUTCOME
9:00-9:10	Welcome & Introductions o Review Agenda	M. Blanchard	
9:10-9:20	Status of Office of Geologic Disposal (OGD)	L. Smith	Understand Current Status of Program
9:20-10:00	Status of Yucca Mountain Site Characterization Project (YMP)	R. Dyer	Understand Current Status of Project
10:00-10:15	Status of Design and Construction Effort Supporting the Exploratory Studies Facility (ESF)	W. Simecka	Understand Current Status of ESF Design and Construction Effort
10:15-10:30	Status of Site Characterization Testing Program and Preparation and Approval of Study Plans(SPs)	S. Jones	Understand Current Status of Testing Program and SPs
10:30-10:45	BREAK		
10:45-11:00	Results from the NRC Management Meeting and Technical Exchange on Design Control	T. Petrie	Understand Results of Meeting with the NRC
11:00-11:30	Recent Results of Progress in the Natural Resources Assessment and Plans for the Future	Z. Peterman	Understand Current Status of Natural Resources Assessment
11:30	ADJOURN FOR LUNCH		

YUCCA MOUNTAIN NEWS ITEMS

TODAY'S DATE IS: October 29, 1993

1. REVIEW BOARD CRITICAL OF YUCCA MOUNTAIN NUCLEAR WASTE STUDY
   Pahrump Valley Times, 10/22/93

2. WORKSHOP TACKLES POPULATION QUESTION
   Pahrump Valley Times, 10/22/93

3. NATION'S NUCLEAR WASTE MAY PASS THROUGH ELKO
   Elko Daily Free Press, 10/21/93

NEVADA NEWSPAPER SOURCES:	CIRCULATION:	
Las Vegas Review-Journal	140,500 Daily	208,789 Week
Las Vegas Sun	34,011	208,789
Henderson Home News		16,000
Austin Reese River Reveille		500
Death Valley Gateway Gazette		5,500
Elko Free Daily Press	6,700	
Eureka Sentinel		500
Lincoln County Record		1,500
Mason Valley News		3,850
Moapa Valley Progress		2,800
Pahrump Valley Times		5,500
Record Courier (Gardnerville)	7,000	7,000
Tonopah Times		3,000
Reno Gazette-Journal	67,104	83,490
Carson City Nevada Appeal	11,500	12,520
Sparks Tribune	7,000	10,000
Ely Daily Times	2,392	2,600
Inyo Register		3,000

For further information or assistance please contact:
Corey Lieber, Institutional and External Affairs, SAIC,
phone (702) 794-7246, FAX (702) 794-7623

October 22, 1993, Pahrump Valley Times, Page 9

Review board critical of Yucca Mountain nuclear waste study

The Nuclear Waste Technical Review Board has issued a report critical of the Dept. of Energy's site characterization work at Yucca Mountain, proposed site for a nuclear waste repository.

According to the report, despite improvements during the last four years in the DOE's plans for exploration and testing in an underground facility, the NWTRB remains concerned that, because of past delays in initiating excavation and attempts to comply with overly optimistic schedules, the DOE is making technical decisions about the design and excavating "without sufficient analysis."

Underground exploration and testing are major components of the DOE's efforts at Yucca Mountain to evaluate the site for suitability for locating a permanent repository for spent nuclear fuel and high level defense waste.

This geo-engineering board would work with the management and staff at Yucca Mountain on a regular basis to review detailed decisions as they are made to provide guidance on improving the management of the design and excavation of the facility.

There is a wealth of expertise the DOE could draw on for the project, according to the report.

Workshop tackles population question

More people equal more Yucca impact dollars

By RICH THURLOW

When it comes to potential federal funding, Pahrump's population is worth much more than coffee shop debate. According to Les Bradshaw, head of Nye County's Nuclear Waste Repository Project Office, it can also mean big bucks when it comes to mitigating Yucca Mountain impacts.

The problem, then, is determining what the population actually is, Bradshaw said, and having that population figure stand up to close scrutiny.

That was the thrust of Wednesday morning's Pahrump population estimates workshop held in the Yucca Mountain office at Pahrump Station. The workshop was led by Bradshaw and Planning Information Corp. officials, and was attended by Dept. of Energy officials, members of the local planning advisory board, town board chair Bob Little and town manager Roger Baltz, among others.

PIC, which has been handling the socio-economic work for the county relating to Yucca Mountain, estimates Pahrump's population at 11,731 as of July 1. That's slightly higher than the Pahrump Valley Times' low-end estimate for the end of the first quarter, and about 2000 less than the newspapers' mid-range population estimate for the end of the first quarter.

Both the newspaper and PIC use the 1990 census as a baseline for current projections.

As Bradshaw explained, however, any population figure

(See "Population," Page 19)

Population

(Continued from Page 18)

attached to Pahrump has to be "credible," just like the county's oversight work on technical aspects of site characterization at Yucca Mountain.

For example, Bradshaw said the county could go to DOE and report that before Yucca Mountain work started, Pahrump had 1000 residents, but now it has 4000, "and we want mitigation impact money. We want schools, police cars, computers for the town office."

Bradshaw added it is the county commission's objective to "get as many benefits" as possible "out to the community." Bradshaw added that was a "worthy objective."

George Blankenship of PIC noted most people in Pahrump believe his group's estimates of the population are "too conservative." However, he said it's tough to get a complete picture of what is going on in Pahrump since there are "no institutional controls" such as building permits.

Standard sources of information, such as electrical or telephone hookups, do not count the people who don't have phones or who have their own generators.

With that in mind, Blankenship said he was open to suggestions as to how to improve population estimates in Pahrump.

Basically, according to Lloyd Levy of PIC, Pahrump's population estimates are based on housing units and telephone hookups. That formula was criticized by Little, who noted a disparity in the number of current housing units provided to PIC. He said that was lower than the number of housing units he was aware of as of July 1. Both PIC and Little said their information came from the county assessor.

Little also chose to dispute PIC's 2.4 residents per household figure, and noted the per-household figure elsewhere in the county was higher. As a real estate seller, Little said his work is almost evenly divided among retirees and young families with children.

Little suggested volunteers divide Pahrump into 10 sections and go out and starting counting people. As long as those taking the count weren't asking for any information other than how many lived in the home, they probably wouldn't meet any resistance, he said.

Others talked of having a formal census taken in Pahrump, or county-wide. Estimates of how much it would cost varied widely.

As Little put it, the town needs something "to hang its hat on."

Other census ramifications, according to Ron Williams of county planning, could include Pahrump getting a third commissioner.

The free-flowing discussion continued for over two hours. When it came to a close, postmaster Bob Philpot threw more figures on the table. Based on mail deliveries in Pahrump and the 2.4 persons per household, the population would be over 18,000. But Philpot agreed that figure was too high, since it included businesses. He added, however, in some cases several families get their mail from one post office box.

The group will get together for another workshop in the near future, perhaps late November or early December. In the interim, PIC and others will study several suggested methods for determining the population.

Those methods include a volunteer census, an official census, infrared aerial photography on a January night (to determine where houses are located and who is living in them, based on the heat in the home), and postal service data.

ELKO DAILY FREE PRESS, Elko Nevada Thursday, October 21, 1993

Nation's nuclear waste may pass through Elko

Thousands of tons of high level radioactive waste could come through downtown Elko when the Yucca Mountain Nuclear Repository begins operation, according to nuclear waste shipment expert Robert Halstead.

Halstead presented a slide show outlining potential routes to Yucca Mountain from across the country and fielded questions during an informal meeting last night at the Northeastern Nevada Museum.

The meeting, attended by only a dozen Elko residents, was sponsored by the Nevada Nuclear Waste Project Office.

Joe Strolin, administrator of planning for the agency, said the purpose of the meeting was to provide information to area residents and raise issues regarding the transportation of nuclear waste to Yucca Mountain.

Strolin attributed the low turnout of people to game four of the World Series.

Strolin said the state opposed the creation of a nuclear waste repository in Nevada but was carefully studying the safest routes to the potential site in the event its creation could not be halted. He said the federal government funded the state's transportation studies.

He said when the repository was conceived in 1983, Congress commissioned a team of scientists to locate the most geologically stable site in the nation. Early studies indicated salt domes in southern Louisiana would be a good site to store radioactive waste, he said.

But, Strolin said, in 1987 Congress abandoned the study of all potential sites other than Yucca Mountain even though the area was one of the most geologically active studied.

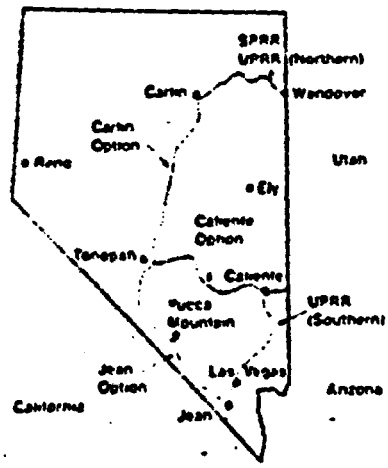
Strolin said the federal government has spent more than $2 billion since 1983 on research and planning for the repository.

Halstead said the federal government has not decided whether to utilize trains or trucks in shipping waste to Yucca Mountain.

He said transportation experts agree the safest method was by trains dedicated to carrying only specially designed casks containing the waste. But no rails exist leading to the proposed repository site, he said.

Halstead said three separate rail routes are currently being considered. One route would divert shipments from the south through Jean, a second route would bring waste into the state through Caliente, and a third would ship it through West Wendover, Elko and Carlin.

Halstead said the Caliente route was the only one of the three the federal government has studied. He said the study showed the route could be the most costly with construction estimated at between $1 and $5 billion. Running rails through Hancock Summit alone would cost between $80 million and $200 million, he said.



Routes to Yucca Mountain

Halstead said another factor that makes the Jean route unlikely is the fact it would divert the nation's nuclear waste through California, a state with a powerful political lobby.

Halstead predicted the route through Elko County, called the Carlin route, would be the next studied by the federal government. The route would bring the nation's nuclear waste through downtown Elko.

He said the most difficult task poised by the Carlin route would be getting out of the Humboldt River valley. To do that would require climbing bluffs between 75 feet and 100 feet high, he said.

Halstead said completion of the repository at Yucca Mountain may never occur but if the federal government forces Nevada to house the site, he wanted to ensure shipment would be safe.

"This is what Congress and the Department of Energy has dumped on us," he said. "Maybe it can be avoided, but if not, the next best thing is being prepared."

The Nuclear Waste Project Office made similar presentations earlier in the day to Elko County and Eureka County Commissioners. Halstead also spoke today to the Inter Tribal Council of Nevada Convention at the Elko Convention Center.

rec'd under letter dtd 11/22/93

TPO MEETING

YMP/OCRWM UPDATE

PRESENTED BY

LINDA SMITH

ACTING ASSOCIATE DIRECTOR,
OFFICE OF GEOLOGIC DISPOSAL

OCTOBER 29, 1993

102.

ENCLOSURE 2B

DANIEL DREYFUS, OCRWM DIRECTOR

- Confirmed by Senate October 7, 1993
- Visited Nevada October 20, 1993
  - Met with employees
  - Toured Yucca Mountain October 21, 1993
- Dr. Dreyfus will be a strong leader and he has the confidence of the Secretary
- Lake Barrett will be principal Deputy Director
- Strategic planning processes have begun

THE STATE OF NEVADA'S RECENT LAWSUIT

- The State of Nevada wanted to petition and take depositions from 27 scientist who were involved with reviews relating to the Szymanski theory

- The state felt it was necessary to do this because some of the scientists involved may be deceased, unavailable, or without the recollection of facts, and they intend to challenge future decisions

- A Federal judge ruled on October 4 that the state could not do this because:
  - The court would not allow the taking of depositions for actions that may not occur for ten years
  - Or it may not occur at all for information that is already available

THE STATE OF NEVADA'S RECENT LAWSUIT

(CONTINUED)

- The court said Nevada cannot ask for depositions when they had yet to file the lawsuit

- State filed a request for court to reconsider its October 4th decision. State believed it likely that the Court did not have the benefit of a briefing that the state filed on September 29 before it issued the October 4th decision.

- Justice Department is preparing a response to this latest state request

MRS GRANTS

- Conferees of the energy and water appropriations bill voted to require the approval of appropriate political entities before nuclear waste fund money can be spent to study
- This action came from an amendment introduced by New Mexico's Senator Bingaman
- Currently the Mescalero Apache Tribe and the Skull Valley Goshute Tribe have requested 2.5 million
- Former Idaho Representative Richard Stallings has been confirmed as the Nuclear Waste Negotiator
- Thus far, DOE is not able to give these grants if the applications were found suitable

YMPO REORGANIZATION

- We have been looking at three options for reorganizing the YMPO
- These options have been made with the input from all the management at YMPO down to the branch chief level; there has been a lot of discussion with many members of the staff about the reorganization
- We are in the process of making a final selection. We will present the organization structure to OCRWM Director, Dan Dreyfus.

SECRETARY'S REVIEW

- Plans are underway for fielding a broad based project management/financial review
- The Department has been working with Governor Miller's staff and think we've come to a good arrangement
- Three panel members will be selected to head this review; one member selected by Governor Miller, another by the DOE, and another by an independent entity
- The panel will then select a contractor that will perform the review for the board

UPCOMING OUTREACH EVENTS

• NWTRB Joint T&S/EBS Panel Workshop	11/1-2/93
• Discover Southern Nevada LV Chamber of Commerce	11/4/93
• Public Update Meetings Pahrump, Las Vegas, Reno	11/8-10/93
• Public Open House Tour	11/17/93
• American Nuclear Society - Results of In-Situ Testing at Geologic Disposal Sites	11/18/93
• Yucca Mountain Speaker Series - Archaeology in Perspective	11/30/93

TPOUPDAT9.PM5.1214/10-29-93

AFFECTED UNITS OF LOCAL GOVERNMENT (AULG) OUTCOME 10/14/93

- Strong cooperation and dialogue among participants
- New approach - not just and update of presentations
  - Discussions on how DOE decisions are made
- Substantive discussions about the means to involve public - focus on process
- Identified a number of issues appropriate for public involvement (i.e. site suitability, EIS scoping, pneumatic pathways workshop)
  - Will be forming workshop groups to work with DOE

TPO MEETING

PRESENTED BY

RUSS DYER

ACTING PROJECT MANAGER

OCTOBER 29, 1993

Enclosure 2

Director's Goals and Priorities

- Comply with all laws and Federal regulations
- Maximize prioritized scientific investigations essential to Yucca Mountain Site suitability determination, with appropriate balance between
  - Exploratory Studies facility construction and underground testing,
  - Surface-based testing, and
  - Data analysis and performance assessment activities attendant to scientific investigations

Director's Goals and Priorities

(Continued)

- Enhance Waste Acceptance Capability:
  - Continue support for voluntary MRS siting effort
  - Optimize progress in analysis/development of MPC concept for availability in 1998
  - Pursue limited 1998 transportation capability
- Limit all other program support activities to those essential for advancing the waste acceptance objectives
- Support the Secretary's program review goals, with emphasis on expanding the systematic involvement of stakeholders in the collaborative consultation process

Yucca Mountain Project Manager's Goals and Priorities

- Continue development of ESF pursuant to the earliest possible determination of site suitability
- Continue the advanced conceptual design of both the waste package and repository, to the degree necessary for ESF development, MGDS and OCRWM system studies
- Continue implementation of the surface-based testing program pursuant to the earliest possible determination of site suitability
- Continue compilation of environmental data necessary for the earliest possible determination of site suitability

Yucca Mountain Project Manager's Goals and Priorities

(Continued)

- Continue to identify and pursue resolution of difficult technical issues that bear on the overall suitability of the site
- Continue to support development of a design for standardized spent-fuel containers for storage, transportation and disposal
- Continue necessary compliance with all applicable YMP commitments, DOE Orders and regulations to insure safety and regulatory compliance of all parts of the program
- Continue to define and implement cost reduction initiatives consistent with the overall goals of the project

Yucca Mountain Site Characterization Project

(Year of Expenditure $M)

WBS		FY93	FY94	PRELIMINARY FY95	FY96
1.2.1	Systems Engineering	5.8	5.8	8.2	8.5
1.2.2	Waste Package	8.3	10.5	16.0	18.1
1.2.3	Site Investigations	49.4	58.9	141.3	118.0
1.2.4	Repository	4.4	4.9	19.4	24.1
1.2.5	Regulatory	24.5	23.8	28.1	35.0
1.2.6	ESF	48.8	55.0	110.0	110.0
1.2.7	Test Facilities	10.5	12.9	40.2	46.2
1.2.8	Reserved				
1.2.9	Project Management	17.5	16.7	19.1	19.8
1.2.10	Financial Assistance	17.6	21.8	49.2	72.2
1.2.11	Quality Assurance	10.0	9.0	12.4	13.4
1.2.12	Information Mgmt	10.9	10.5	15.7	17.2
1.2.13	Env, Safety and Health	13.5	14.7	20.5	21.4
1.2.14	Institutional	3.5	4.0	5.4	5.5
1.2.15	Support Services	20.0	20.0	27.1	34.3
	MACTEC Closeout		.8		
	Management Reserve		(141.0) K		
Total		244.7	269.3	512.6	543.7

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT
OMB PROFILE - REVOLVING FUND
(YEAR OF EXPENDITURE $M)

WBS		PRIOR	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05	TOTAL
121	SYSTEMS ENGINEERING	24.4	5.8	5.8	8.2	8.5	8.7	8.8	9.0	9.2	9.4	9.2	8.7	8.3	7.8	131.8
122	WASTE PACKAGE	88.4	8.3	10.5	16.0	18.1	21.3	23.2	26.3	23.4	40.0	73.3	50.0	15.3	12.4	426.5
123	SITE INVESTIGATIONS	337.3	49.4	58.9	141.3	118.0	105.0	95.0	95.0	96.4	101.1	20.0	20.0	20.0	20.0	1277.4
124	REPOSITORY	95.5	4.4	5.0	19.4	24.1	26.8	26.9	54.1	54.1	71.7	91.6	93.6	15.3	12.4	594.9
125	REGULATORY	113.7	24.5	23.8	28.1	35.0	35.0	35.2	35.2	35.5	52.6	85.5	93.0	85.0	75.0	757.2
126	ESF	111.7	48.8	55.0	110.0	110.0	110.0	105.0	75.0	75.0	19.0	19.0	19.0	19.0	19.0	895.5
127	TEST FACILITIES	30.0	10.5	12.9	40.2	46.2	49.1	42.1	37.1	33.4	25.8	25.9	26.7	27.6	28.4	435.9
128	RESERVED															
129	PROJECT MANAGEMENT	122.3	17.5	16.7	19.1	19.8	21.2	22.4	22.9	23.4	23.9	23.2	22.5	21.7	20.8	397.4
1210	FINANCIAL ASSISTANCE	86.5	17.6	21.8	49.2	72.2	72.3	70.7	71.1	68.6	69.6	70.0	67.8	53.1	51.0	841.3
1211	QUALITY ASSURANCE	69.5	10.0	9.0	12.4	13.4	17.0	19.0	19.4	19.5	19.5	19.5	18.7	16.6	15.6	279.2
1212	INFORMATION MANGMNT	54.0	10.9	10.5	15.7	17.2	17.5	16.8	16.8	17.0	17.0	17.0	14.0	12.0	12.0	248.2
1213	ENVIR/SAFETY & HEALTH	48.7	13.5	14.7	20.5	21.4	21.9	20.7	20.7	20.7	20.7	12.2	11.9	11.5	11.1	270.2
1214	INSTITUTIONAL	13.7	3.5	4.0	5.4	5.5	6.6	8.7	8.8	8.9	9.6	9.8	9.4	8.9	9.1	111.8
1215	SUPPORT SERVICES	59.8	20.0	20.0	27.1	34.3	35.7	35.7	39.3	38.9	45.1	54.1	51.5	31.4	28.4	521.4
TOTAL		1255.5	244.7	268.6	512.6	543.7	548.2	530.3	530.8	524.0	524.9	530.1	506.6	345.5	323.1	7188.7
	MACTEC CLOSEOUT			0.8												
	MANAGEMENT RESERVE			-0.1												
TOTAL				269.3												
	FIRST REPOSITORY			0.9	1.0	1.0	1.1									4.0
	M&O INFRASTRUCTURE			5.2	5.2	5.2	5.2									20.8
TOTAL		1255.5	244.7	275.3	518.7	549.9	554.5	530.3	530.8	524.0	524.9	530.1	506.6	345.5	323.1	7213.4

NOTES:

1. ASSUMES BALANCED PROGRAM
2. OPERATE TBM IN FY'94
3. PURCHASE SECOND TBM IN FY'95
4. ASSUMES NO BENEFITS IN WBS 1.2.10 UNTIL FY'96
5. BEGINNING IN FY'95 1.2.7 INCLUDES 12.5% NTS ALLOCATION BASED UPON:
6. 1.2.15 FUNDING IS BASED UPON 16% TOTAL OF:
   90% OF 1.2.1, 1.2.2, 1.2.4, 1.2.5, 1.2.9, 1.2.11, 1.2.12, 1.2.14
   20% OF 1.2.3, 1.2.6, 1.2.7
   50% OF 1.2.13
7. INCLUDES ADDITIONAL PETT FOR NYE COUNTY STARTING IN FY94

Drilling Program

- Purpose of this protocol is to provide assurances to Nye County that DOE's decision about Yucca Mountain's suitability (pro or con) is based on findings resulting from scientific research that has been conducted thoroughly and on a sound scientific basis
- Will better prepare Nye County as a participant in licensing process if site is found suitable
- Allows testing by Nye County and alternative drilling and sampling strategies
- Protocol lays out duties and responsibilities (i.e., permits, safety & health standards, environmental surveillances, drilling, monitoring, clean-up, remediation and reclamation)

NRC Interactions

Topical Reports

- Formally accepted the Extreme Erosion Topical Report for review
  - Have requested additional information to assist in the review
- Seismic Hazard Methodology is suitable for a Topical Report
  - In preparation stages for the technical exchange scheduled for November 17, 1993 in Washington, D.C.

Schedule of Upcoming NRC Meetings

11/17/93	NRC Seismic Hazard Methodology Topical Report
11/18/93	NRC Management Meeting: Interactions Scheduling (DOE/NRC interactions for period of Jan-June 1994)
12/7/93	NRC/DOE Management meeting on ESF Status

NWTRB Report:

Underground Exploration and Testing at Yucca Mountain October 1993

Board agrees with DOE on the following

- The overall objective established by DOE for underground exploration and testing
- The decision to eliminate competing activities during excavation of the initial underground loop
- The proposed enhanced configuration for the exploratory studies facility
- Minimizing the ESF ramp grades
- Use of rail support
- Use of smaller tunnel boring machine outside the main drifts
- Drifting parallel to the Ghost Dance fault
- Development of repository design in concert with the evolving ESF design
- Simplification of surface and subsurface facilities and utilities
- Need to resume thermal testing as soon as possible

NWTRB Report:

Underground Exploration and Testing at Yucca Mountain October 1993

(Continued)

Key recommendations to DOE

1. Develop a comprehensive strategy that integrates exploration and testing priorities with the design and excavation approach for the exploratory facility
2. Resume underground thermal testing as soon as possible
3. Establish a geoengineering board with expertise in the engineering, construction, and management of large underground projects

Additional management recommendations to DOE

1. Develop a more efficient system for managing the performance of contractors involved in ESF design and construction
2. The Secretary's OCRWM financial review should include an evaluation of the program's funding allocation decisions.

NWTRB Full Board Meeting - October 19-20, 1993

DOE's Site Characterization Testing Program

- Topics discussed
  - Pneumatic Testing and ESF Construction
  - Systematic drilling program
  - Update of YMPs drilling program
  - Planned ESF testing and test locations
  - Characterization of the YM Unsaturated Zone in the ESF
  - Thermal Testing update
  - Testing Program coordination and integration

NWTRB Full Board Meeting - October 19-20, 1993

DOE's Site Characterization Testing Program

(Continued)

- Board pleased with
  - Integration between surface-based and underground testing programs
  - Overall testing program integration and coordination
  - Information presented and candid discussion
- Board still has concern with
  - Integration between researchers and research organizations (e.g., PA)

Schedule of upcoming NWTRB meetings

November 1-2, 1993 T&S/EBS panel Dallas, TX	Discussion of the technical challenges of interim storage
November 22, 1993 E&PH panel Las Vegas, NV	Terrestrial ecosystems briefing
January 10-12, 1994 Full Board Arlington, VA	Results of TSPA II; Systems update; "Alternative licensing strategy" report; "Trust and Confidence" task force report; (ESF update?)
**January 1994 EP&H panel Location TBD	Scientific studies needed to support long-term environmental impacts of a Yucca Mountain repository
**February 1994 EBS panel Location TBD	Topic TBD
**February or March 1994 SG&G panel Location TBD	Discussion of probabilistic risk assessment; Focus on seismic issues and volcanism
April 11-13, 1994 Full Board Reno, NV	Use of science in site assessment-emphasis on low-level waste siting/Martinsville experience; saturated zone hydrology; ESF update
July 11-13, 1994 Full Board Denver, CO	Transportation issues, radionuclide transport, ESF update
October 12-13, 1994 Full Board Las Vegas, NV	Environmental issues; engineered barrier system; ESF update

**** Tentative meetings**

NWTRB panels:
T&S - Transportation and Systems
EBS - Engineered Barrier System
SG&G - Structural Geology and Geoengineering
E&PH - Environment and Public Health

As of October 26, 1993
upcoming.mtg

Environmental

- Hantivirus is the type of virus suspected of causing a number of deaths and illnesses in the Four Corners region earlier this year
  - Additional cases outside the Four Corners region were not confirmed until July and August. These included a woman, who survived, north of Tonopah and a woman, who died, working in the Mammoth Lakes area of California
- EG&G/EM biologists contacted the Centers for Disease Control (CDC) after the confirmed Nevada case to gather information about the virus and risks of contact.

Environmental

(Continued)

- In August, scientists from CDC, the State of Nevada, Washoe County, and EG&G/EM trapped and drew blood from 496 rodents near Yucca Mountain. REECo trapped an additional 57 rodents on Paiute and Ranier Mesas on the northern end of the NTS.
- All blood samples from the Yucca Mountain rodents, including the few deer mice captured there, tested negative for hantavirus antibodies suggesting no exposure. Ten of the 57 rodents from the northern end of the Test Site tested positive for hantavirus antibodies. All ten were deer mice.
- The risks for exposure at Yucca Mountain appears to be very low based on these tests.

TPO MEETING

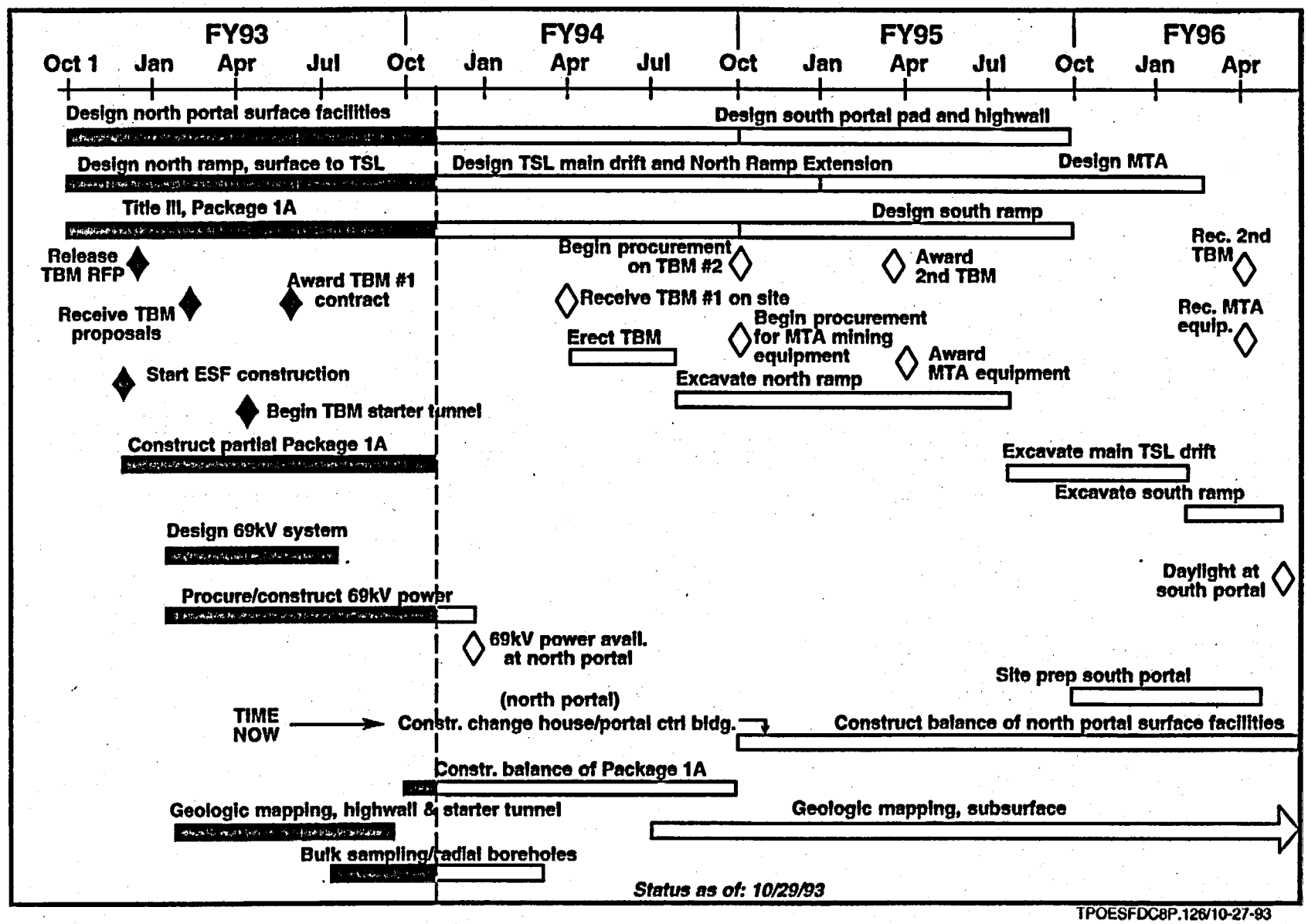
STATUS OF ESF

PRESENTED BY
TED PETRIE
DEPUTY DIVISION DIRECTOR, ENGINEERING AND DEVELOPMENT DIVISION
YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

OCTOBER 29, 1993

ENCLOSURE 2D

PLANNED ESF DESIGN/CONSTRUCTION ACTIVITIES
FY 93 - 96



TPOESFDC8P.126/10-27-93

ESF DESIGN MILESTONES

Milestone/Activity	Planned	Expected
Start Title II design activity Packages 1 and 2	10/1/92	10/1/92(A)
Start 50% review, Package 1B	4/12/93	4/12/93(A)
Start 50% review, Package 2	4/22/93	4/19/93(A)
Start 90% review, Package 2A	7/19/93	7/19/93(A)
Start 90% review, Package 1B	8/11/93	8/2/93(A)
Start 90% review, Package 2B	11/15/93	11/30/93(E)
Start 90% review, Package 2C	2/21/94	2/21/94(E)

ESF CONSTRUCTION MILESTONES

Milestone/Activity	Planned	Expected
Start excavation of North Ramp starter tunnel	4/2/93	4/2/93(A)
Award TBM contract	4/15/93	5/27/93(A)
Award underground construction contract	10/15/92	8/2/93(A)
Complete 61 meters (200ft) starter tunnel	9/20/93	9/9/93(A)
Receive final TBM shipment	4/4/94	4/4/94(E)

SESFPM6P11.126/10-29-93

ESF ACCOMPLISHMENTS

- Construction
  - Started excavation of Alcove #1
- Design
  - Completed 90% Design Review for Package 1B (M&O)

ESF PLANNED ACTIVITIES FY94

- Procure and install water system
- Procure and install sanitary sewer system
- Procure and install subsurface waste water system
- Procure surface conveyor system
- Prepare and install compressed air system
- Prepare and install electrical distribution system
- Complete 69kV system
- Erect Switchgear building
- Receive and set up Tunnel Boring Machine (4/4/93)

ESF PLANNED ACTIVITIES FY94

(CONTINUED)

- Operate TBM for approximately 1 month (begin Aug 94)
- Install subsurface utilities
- Procure spares for TBM
- Procure and install rail system
- Complete design of Package 1, 2 and 8B (North Ramp extension)
- Start design of Package 8A (TSL Main Drift)

TPO MEETING

RESULTS FROM THE NRC MANAGEMENT MEETING AND TECHNICAL EXCHANGE ON DESIGN CONTROL

PRESENTED BY
TED PETRIE
DEPUTY DIVISION DIRECTOR, ENGINEERING AND DEVELOPMENT DIVISION
YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT

OCTOBER 29, 1993

ENCLOSURE 2E

CONCERNS IDENTIFIED IN NRC'S AUGUST 20, 1993 LETTER REGARDING ESF

1) DOE should provide the "Rationale for proceeding with the M&O design activities and ESF construction while the design control process deficiencies are being investigated and corrected."

2) DOE should provide "A detailed action plan providing for corrective actions for the M&O design deficiencies, including root cause analysis and verification of the effectiveness of corrective actions."

CONCERNS IDENTIFIED IN NRC'S AUGUST 20, 1993 LETTER REGARDING ESF

(CONTINUED)

3) DOE should provide "The date when a controlled baseline ESF design, integrated with a conceptual GROA design, will be formally provided to the NRC for review and comment."

   DOE needs to provide in its Progress Report: 1) ". . .how the ESF is incorporated into the GROA."; and , 2) ". . .a complete summary of all design documents that have been, or need to be, formally submitted to the NRC for review, and a discussion of how these documents relate to one another to present a complete picture of the ESF and conceptual GROA design."

CONCERNS IDENTIFIED IN NRC'S AUGUST 20, 1993 LETTER REGARDING ESF

(CONTINUED)

4) DOE should provide "A detailed plan for the process DOE will use to keep the NRC staff informed in a timely manner of design changes which have the potential to impact ongoing testing activities, the ability to conduct proposed testing activities, or the ability of the site to isolate waste. In addition, DOE should discuss how the proposed changes will be responsive to the staff's SCA concerns related to site characterization and the ability to gather representative technical data in the ESF."

Other items in NRC letter identified 6 potential concerns

- 5 were included in items 1 - 4 above
- "The staff also has concerns which resulted from deficiencies identified during. . . independent design reviews. . .The deficiencies include . . . inadequate documentation of design bases, and questionable design details. They involve both the manner in which design activities were performed and apparent delays in the identification and correction of the deficiencies."

THE 17SEP93 NRC/DOE MANAGEMENT MEETING RESULTED IN CLARIFICATION OF THE 20AUG93 LETTER, PARTICULARLY FOR ITEM #3

DOE Needs to Answer the Following Questions-

- What documents are needed to conduct a review and understand the complete ESF Design?
- How are these documents integrated?
- What control mechanisms are there to assure that ESF Design is integrated with Study Plans?
- How are ESF Design documents integrated with those Study Plans that discuss plans to gather data for ESF design?
- How are ESF construction schedules integrated with testing schedules for gathering of ESF design information?

NRC INDICATED THAT IT NEEDS INFORMATION IN THE FOLLOWING AREAS, TO A LEVEL OF DETAIL CONSISTENT WITH REGULATORY GUIDE 4.17, DURING PRE-LICENSING REVIEWS

- Drawings showing layout of ramps, drifts, and ESF test areas
- Description of the GROA design in sufficient detail to show interface with ESF
- Description of the interfaces between the ESF and the GROA
- Discussion of how the various Title II design packages are integrated with each other, and their relationship to the overall design
- Description of the design basis for the ESF including assumptions, their basis, and the logic behind decisions related to the design and design process
- Identify what study plans are on the critical path for completion of ESF design, and the sequencing of those studies with ESF design activities

A TECHNICAL EXCHANGE WAS HELD BETWEEN DOE AND NRC ON OCTOBER 4 & 5. NRC WAS BRIEFED ON THE FOLLOWING SUBJECTS:

- Management of the Project Baseline
- Scientific Investigation Control Process
- Design/Construction Process
- Design Control Improvement Plan
- Corrective Action Program
- ESF Design Strategy
- Proposed ESF Design Changes
- Phased Approach to ESF Design and Construction
- A/E and DOE Requirements Hierarchy
- * Determination of Importance Evaluations
- ESF Construction and Ventilation Impact
- Surface Based Testing
- Fire Suppression
- Underground Diesel Emissions in the ESF
- ESF Seismic Design Basis
- Roof Bolting and Ground Control Operations
- ESF Construction
- ESF/GROA Interfaces
- ESF Design Interfaces with Surface Based Testing and in-situ testing

NRC STATED THAT IT NEEDS TO GAIN CONFIDENCE THAT THE DESIGN PROCESS IS BEING CONDUCTED PROPERLY AND THAT THE DESIGN IS ADEQUATE:

- NRC needs to be better informed, and able to observe the design process without severely impacting DOE
- Bi-monthly Technical Exchange meetings are to be held
- Currently conducting informal weekly teleconferences between NRC and ESF Branch Chief
- DOE developing plans to improve process for exchange of information e.g., Design Packages
- DOE will provide for NRC observance of the DOE product acceptance process

TPO MEETING

OCTOBER 93 STATUS (FY94)

SITE CHARACTERIZATION PROGRAM

PRESENTED BY
SUSAN B. JONES, DEPUTY DIRECTOR
REGULATORY AND SITE EVALUATION DIVISION

October 29, 1993

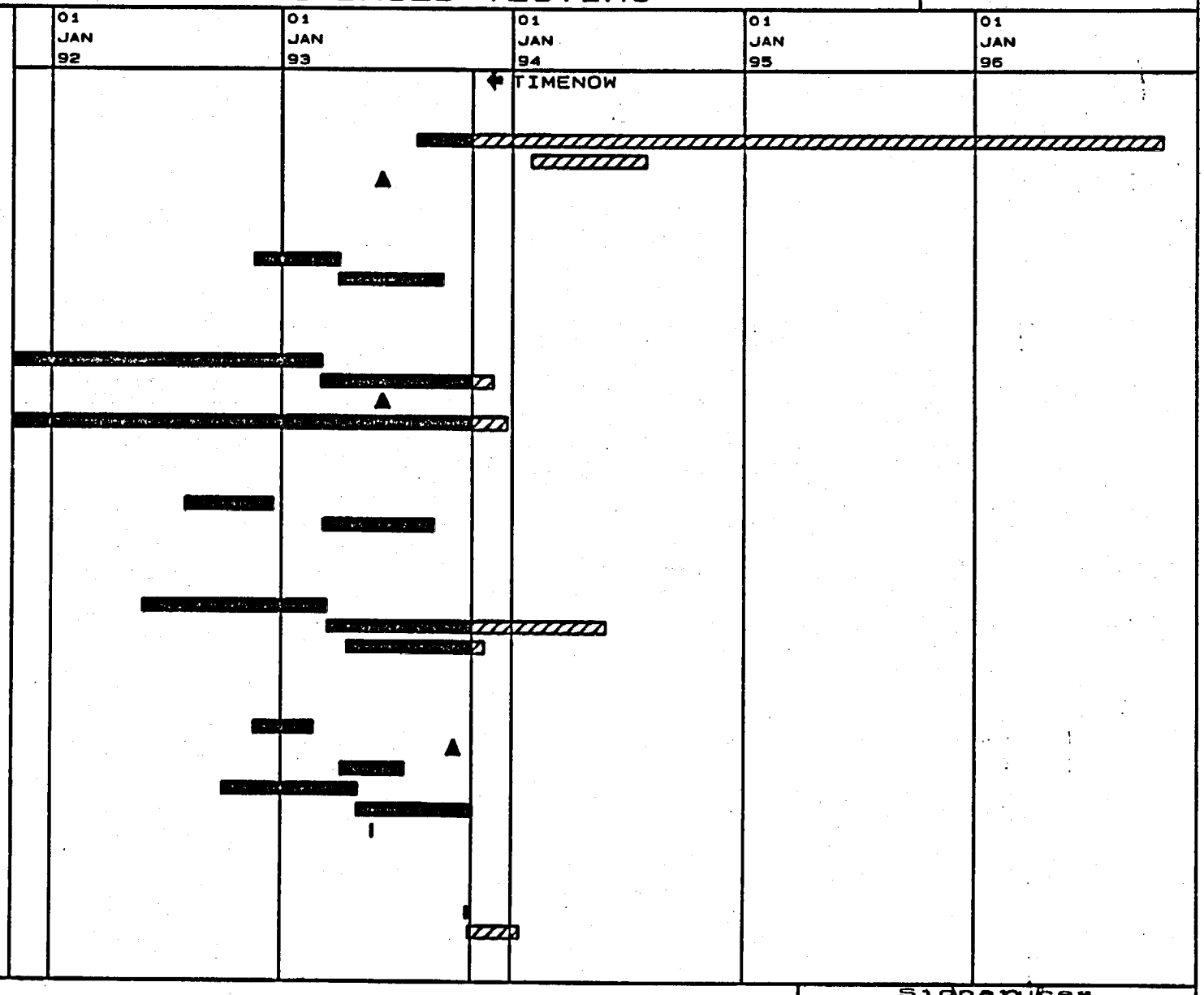
ENCLOSURE 2F

Report: SURFBAR
Project: ROBIN
Time Now: 29OCT93
Date: 28OCT93
Page: 1

YUCCA MOUNTAIN PROJECT
SURFACE BASED TESTING

OCRWM

TASKS	START	FINISH
NEW SITE INVESTIGATION ACTIVITIES		
SATURATED ZONE - C-WELLS	02AUG93	22OCT96
GEOPHYSICS-SEISMIC REFLEC	01FEB94	29JUL94
NRC TE GEOPHYSICS IN		08JUN93
WT2-UZ16 SHALLOW REFLECTI	30JUL93	28OCT93
PROVIDE GEOLOGIC DATA FOR ESF DESIGN		
MAPPING		
PORTAL AND BOX CUT	20NOV92	01APR93
ESF STARTER TUNNEL	01APR93	10SEP93
COMPLETE VOLCANISM STUDIES		
DRAFT TECHNICAL REPORT	01NOV91	04MAR93
FINAL TECHNICAL REPORT	04MAR93	30NOV93
NRC TE		09JUN93
TEST PITS	01NOV91	23DEC93
UNSATURATED ZONE INFILTRATION		
UNSATURATED ZONE INFILTRATION		
PHASE IIA	31JUL92	17DEC92
PHASE IIB	08MAR93	27AUG93
UNSATURATED ZONE PERCOLATION		
UNSATURATED ZONE PERCOLATION		
UZ-16 DRILLING	27MAY92	11MAR93
UZ-16 TESTING	15MAR93	27MAY94
UZ-14 DRILLING	15APR93	16NOV93
QUATERNARY FAULT STUDIES		
QUATERNARY FAULT STUDIES		
TRENCH MAPPING-MIDWAY VAL	20NOV92	19FEB93
COMPLETE MIDWAY VALL		30SEP93
REGIONAL TRENCH EXCA.& MA	05APR93	12JUL93
COMP.PHASE I-Q.FAULTING S	30SEP92	30APR93
PHASE II EXCAV.& MAPPING	01MAY93	29OCT93
NRC SITE VISIT	25MAY93	25MAY93
SOIL AND ROCK PROPERTIES		
TRG-7 (ABANDONED)	21OCT93	24OCT93
TRG-7A PHASE 1	25OCT93	12JAN94



Legend
- In progress
- Planned
- Critical

Russ Dyer, Division Director

Signatures
Prep: 10/28/93
Aprv: 10/28/93

Site Characterization Field Activities in Progress

SCP ACTIVITY	TITLE	ACTIVITY
8.3.1.2.1.1	Precipitation and Meteorological Monitoring for Regional Hydrology	On-going measurements
8.3.1.2.1.2	Runoff and Streamflow	On-going 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	Cl-36 measurements
8.3.1.2.2.3	Percolation in the Unsaturated Zone	UZ drilling/testing
New this month 8.3.1.2.2.4	Percolation in the Unsaturated Zone in the ESF (for Alcove #1)	ESF Radical Borehole Testing in Alcove #1
8.3.1.2.2.7	Unsaturated Zone Hydrochemistry	UZ drilling/testing
8.3.1.2.3.1	Site Saturated Zone Groundwater Flow System	On-going monitoring
8.3.1.2.3.2	Saturated Zone Hydrochemistry	On-going monitoring
8.3.1.2.6	Gaseous Phase Movement in the Unsaturated Zone	UZ drilling/testing

As of 10/29/93

Site Characterization Field Activities in Progress continued

SCP ACTIVITY	TITLE	ACTIVITY
8.3.1.3.2.1	Mineralogy, Petrology, and Rock Chemistry of Transport Pathways	Outcrop Sampling
8.3.1.3.2.2	Mineralogic and Geochemical Alteration	Outcrop Sampling
8.3.1.4.2.2	Structural Features Within Site Area	Surface & ESF Mapping
8.3.1.8.5.1	Characterization of Volcanic Features	Test pits, Trenching
8.3.1.14.2	Soil and Rock Properties of Potential Location of Surface Facilities	Test pits, trenching, ramp, exploration holes
8.3.1.15.1.8	In Situ Design Infiltration	Construction monitoring/
8.3.1.17.4.2	Location and Recency of Faulting Near Prospective Surface Facilities	Trench mapping testing
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 Mapping
8.3.1.17.4.10	Geodetic Leveling	Traversing

As of 10/29/93

C-WELL TESTING
Study Plan: 8.3.1.2.3.1

Status:

Remediation plan submitted to NDEP; verbal OK received to fill holes.

Holes near the rig backfilled. One area to be left open until completion of remediation testing.

Grading of pad prior to packer installations and open hole testing (Phase 1) underway.

Working to resolve electrical cable issue via DOE order exception process.

Concerns:

None

Planned Activities:

Drill Rig on site Monday (11/1/93) with USGS PI for Phase I work - packers, pump shroud installations.

Begin pipeline construction; move USGS equipment from Raymond Quarry to NTS.

As of 10/29/93

GEOPHYSICAL REFLECTION SURVEY
SP: 8.3.1.4.2.1

Planned start date:	FY 1994.
Status:	Activity scheduled for FY 1994.
Concerns:	Ability to develop RFP for FY 1994 contract as soon as possible; availability of funds in FY 1994.
Solutions:	Reduce number of RFP's (of 3 currently planned).
	Encourage USGS to expedite development of RFPs; identify additional FY 1994 funds for seismic line, address impacts of potential test delay.
	Plan for REECo to drill deep shotholes.

As of 10/29/93

ESF TESTING

Status: North Ramp completed to approximately Station 1+94 as of September 10, 1993.

Geologic mapping, photography, line surveys and sampling were completed September 10, 1993. Grouting of rockbolts completed.

Vertical instrumentation boreholes drilled at 1+88'.

Selection of Starter Tunnel Testing Alcove at Station 1+40.

Alcove construction underway. Depth now at 0+36'. Shotcrete, wire mesh, and split sets installed in alcove after geologic mapping.

Drilling water being re-circulated

Hydrochemistry testing underway

As of 10/29/93

ESF Testing Planning Prioritization

ESF TEST PLANNING--PHASE I

TCO Test Event Name	Test Name --(SCP Activity	WBS Number SCP Number	Column of Deferred	Start Date in Field
Geologic Mapping - North Portal Wall and Slot	Underground Geologic Mapping	1.2.3.2.2.1.2 8.3.1.4.2.2 R2	Construction	Ongoing (Feb 1993)

ESF TEST PLANNING--PHASE II

Geologic Mapping - Starter Tunnel	Underground Geologic Mapping	1.2.3.2.2.1.2 58.3.1.4.2.2 R2	Construction	April 2, 1993 (in progress)
Perched Water - Started Tunnel (contingency)	Perched Water Testing in the ESF	1.2.3.3.1.2.4 8.3.2.2. R1	Construction	Contingency April 2, 1993 (none identified)
Consolidated Sampling - Starter Tunnel	Matrix Hydrologic Properties Testing	1.2.3.3.1.2.3 8.3.1.2.2.3	Construction/ Deferred	May 3, 1993
	History of Mineralogic and Geochemical Alteration of YM	1.2.3.2.1.1.2 8.3.1.3.2.2	Construction/ Deferred	May 1993
	Chloride and Chlorine-36 Measurements of Percolation at Yucca Mountain	1.2.3.3.1.2.2 8.3.1.2.2.2 R1	Construction/ Deferred	May 1993
Construction Monitoring - Starter Tunnel	Evaluation of Mining Methods	1.2.4.2.1.1.4 8.3.1.15.1.8	Construction	April 2, 1993
	Monitoring of Ground Support Systems	1.2.4.2.1.1.4 8.3.1.15.1.8	Construction	April 22, 1993

As of 10/29/93

ESF Testing Planning Prioritization continued

ESF TEST PLANNING--PHASE IIA

TCO Test Event Name	Test Name--(SCP Activity	WBS Number SCP Number	Construction or Deferred	Start Date in Field
Radial Borehole Testing	Radial Borehole Tests in the ESF - Alcove #1	1.2.3.3.1.2.4 8.3.1.2.2.4	Deferred	Nov 1993
Hydrologic Testing	Hydrochemistry Tests in the ESF - Alcove #1	1.2.3.3.1.2.4 8.3.1.2.2.4	Deferred	Nov 1993
Hydrologic Properties of Major Faults	Hydrologic Properties of Major Faults Encountered in the ESF - Alcove #2	1.2.3.3.1.2.4 8.3.1.2.2.4	Construction/ Deferred	TBD

As of 10/29/93

VOLCANISM STUDIES
SP: 8.3.1.8.1.1 and 8.3.1.8.5.1

Status:

LANL Technical Report (draft) completed 3/4/93 -- final report due 12/17/93

Effects Studies underway

atheses volcanism issues only

Geophysics review underway: external consultant George Thompson--Stanford University

Expert elicitation on E_1 methodology probability calculations underway

Study Plan 8.3.1.8.1.2 submitted to NRC 10/4/93.

Concerns:

Geochronology Problems: $^{40}Ar/^{39}Ar$ data will soon be finalized for Lathrop Wells ;
Magma Chambers--Teleseismic Tomography

Solutions:

Continue Geochronology Program-- Completing Lathrop Wells Study,Starting Sleeping Butte/Crater Flat

As of 10/29/93

UNSATURATED ZONE PERCOLATION
USW UZ-16

Status: Completed Drilling March 11, 1993. TD 1686.16

Testing Underway:
-- CO_2, CH_4, SF_6 monitored during evacuation of Tracer gas (10/1-10/8) to achieve borehole conditions.
--CO_2 collection for C_{14} dating (10/5/93)
--Gas composition changes monitored from 4 intervals

Planned Activities: Continue Testing (Air Permeability) Next week
Planning continues for walk-away VSP, using grouted geophones; May, 1994 test date expected

As of 10/29/93

UNSATURATED ZONE PERCOLATION USW UZ-14

Status:	Drilling Started April 15, 1993
	Core Depth as of October 26, 1993 - 1422.14'; Ream Depth 1421.64'.
	Completed Phase III Concrete grouting of third fracture zone
	Phase IV concete grouting underway (10/29/93)
Planned Activities:	Complete borehole to ~2,000' TD (cased)
	Evaluate perched water/drilling fluid
	Borehole geophysical and hydrological logging is to be conducted after well reaches TD

As of 10/29/93

MIDWAY VALLEY
SP 8.3.1.17.4.2.

Status:	Field data collection is complete
Planned Activities:	Completed Midway Valley final report by December, 199~~4~~3

As of 10/29/93

QUATERNARY FAULTING - REGION
SP: 8.3.1.17.4.3

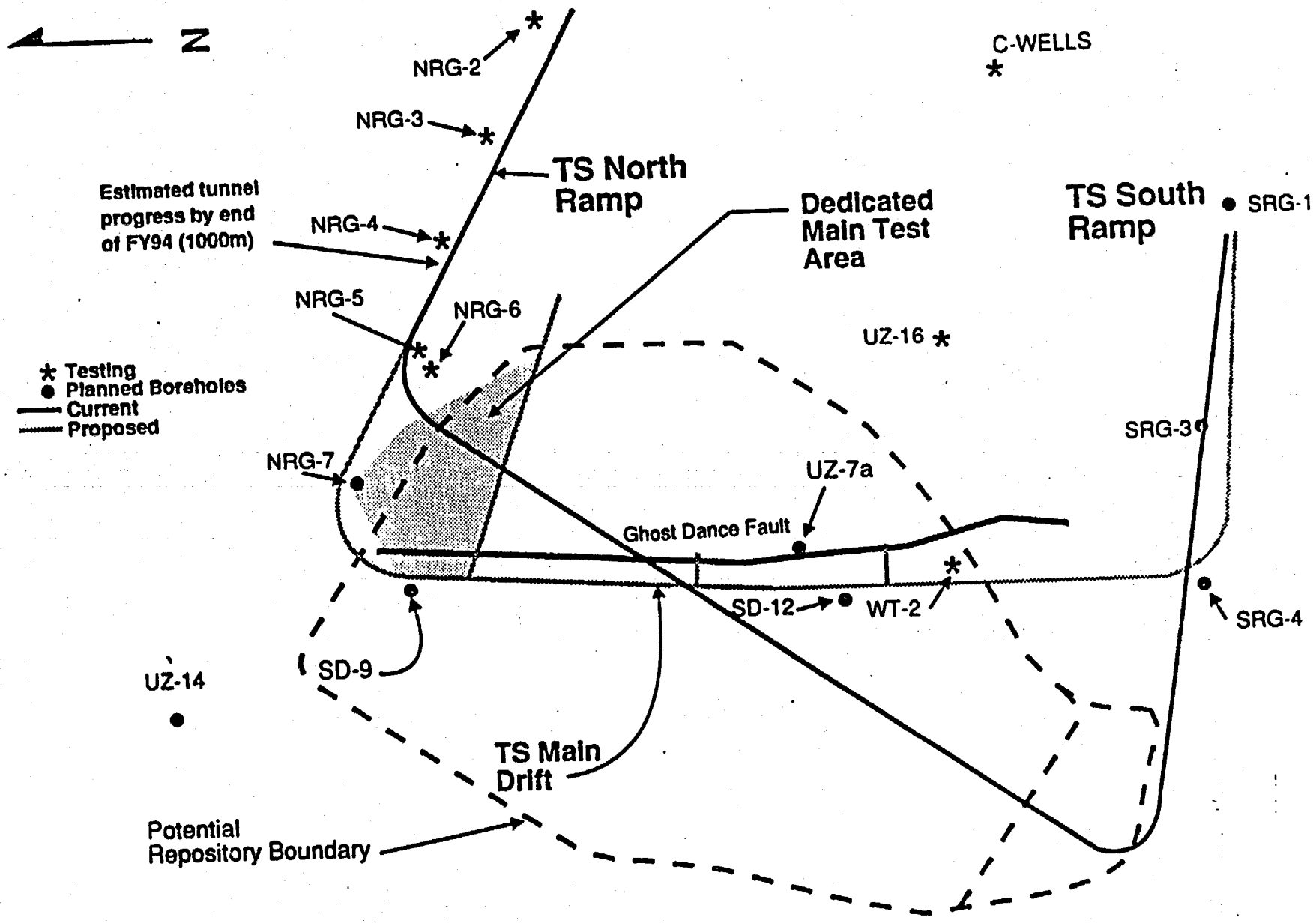
Status:	Preparation of strip map along Bare Mountain fault is underway. Mapping of Furnace Creek fault is in progress Bare Mountain Trench BMT-1 and Test Pits 8 and 9 were excavated late September, 1993- Mapping is underway
Planned Activities:	Excavate Test Pits at Bare Mt. TP-1 through -5 5 more

As of 10/29/93

QUATERNARY FAULTING - SITE AREA
SP: 8.3.1.17.4.6.2

Status:	Mapping of trenches and cleared exposures along Paintbrush Canyon fault, Stagecoach Road fault, and Solitario Canyon fault in progress
	Four excavations along Solitario Canyon fault and its southern splays were completed August 31, 1993; mapping is in progress
Planned Activities:	Finalize trench logs for FY 1993 excavations
	Plan excavations for FY 1994 Ghost Dance fault evaluation

As of 10/29/93



Current & Proposed ESF Alignment and FY 1994 Proposed Drilling and Testing Programs

LYOTRD CDR 124 8 23 93

SOIL AND ROCK PROPERTIES
RAMP BOREHOLES
SP: 8.3.1.14.2

Status:	NRG-2B completed September 14, 1993; penetration resistance tests performed in invert area of proposed tunnel
	Environmental surveys for NRG-2 complex are in progress.
	Geophysical logging in progress for North Ramp boreholes and USW-WT2, to be completed November, 1993
	NRG-7 Borehole started 10/21/93, but deviation problems were encountered and the hole was re-spudded as NRG-7a about 40' away (10/25/93)
	NRG-7a core depth 61.53'as of 10/27/93 (Ream depth 46.00')
Planned Activities:	SD-12 Borehole sited, pad planning complete, pad preparation in progress

As of 10/29/93

GEOLOGIC STUDIES
SP: 8.3.1.4.2.2

Ghost Dance Fault

Status:	Pavement clearing started September 13, 1993
	West pavement cleaned off 10/8/93. Water meters installed on hose lines 10/19/93. East pavement cleaning in progress.
Planned Activity:	Clear and prepare as pavements and conduct geologic mapping
Related New Activities:	Three shallow reflection seismic profiles completed (5,000' - 6,000' ea) for road extending from west of USW-WT2 to UE-25 UZ-16, along Yucca Crest, and near North Ramp alignment to define character of Ghost Dance fault at repository level depths. (10/28/93)
	VSP completed in WT2 and UZ-16; good velocity and stratigraphic control for interpretation of Ghost Dance Fault location.

As of 10/29/93

STUDY PLAN STATUS

	Initial Plans	Revisions
Not Submitted to YMPO	38	3
In Screening Review	0	0
In Project Office Review	0	1
Awaiting Comment Resolution	6	3
In Project Office Verification Audit	3	0
Awaiting Project Office Approval	1	0
Awaiting Submission to the NRC	1	0
NRC Phase 1 Review	9	7
NRC Acceptance	46	3
Total:	104	17

As of 10/08/93

STATUS OF

8.3.1.9.2.1 NATURAL RESOURCE ASSESSMENT OF YUCCA MOUNTAIN, NYE COUNTY, NEVADA

Zell E. Peterman
Yucca Mountain Project Branch
U.S. Geological Survey
Denver, Colorado

TPO Meeting, Las Vegas
October 29, 1993

ENCLOSURE 2G

8.3.1.9.2.1 NATURAL RESOURCE ASSESSMENT OF YUCCA MOUNTAIN, NYE COUNTY, NEVADA

Geologic Setting:

Yucca Mountain is located in a resource-rich geologic setting with major gold production, hydrocarbon exploration, and geothermal potential. The presence of favorable host rocks for both metals and hydrocarbons requires a thorough assessment of its natural resource potential.

8.3.1.9.2.1 NATURAL RESOURCE ASSESSMENT OF YUCCA MOUNTAIN, NYE COUNTY, NEVADA

Study Plan Activities:

- Geochemical Assessment of Yucca Mountain in Relation to the Potential for Mineralization
- Geophysical/Geologic Appraisal of the Site Relative to Mineral Resources
- Assessment for the Potential for Geothermal Energy
- Assessment of Hydrocarbon Resources at or near the Site

8.3.1.9.2.1 NATURAL RESOURCE ASSESSMENT OF YUCCA MOUNTAIN, NYE COUNTY, NEVADA

Accomplishments:

Bergquist, J.R., and McKee, E.H., 1991, Mines, Prospects, and Mineral Occurrences in Esmeralda and Nye Counties, Near Yucca Mountain: U.S. Geological Survey Administrative Report, 385 p. and 1 map.

McKee, E.H., and Bergquist, J.R., 1993, New Radiometric Ages Related to Alteration and Mineralization in the Vicinity of Yucca Mountain, Nye County, Nevada: U.S. Geological Survey Administrative Report, 26 p. and 1 map.

Grow, J., Barker, C.E., and Harris, A., 1993, Oil and Gas Exploration near Yucca Mountain, Southern Nevada (submitted for IHLW Symposium, May 1994)

Peterman, Z.E., Aleinikoff, J.N., Widmann, B., Futa, K., and Walters, M., Isotopic Tracers of Gold Mineralization in Paleozoic Limestones of Southern Nevada (submitted for IHLW Symposium, May 1994)

8.3.1.9.2.1 NATURAL RESOURCE ASSESSMENT OF YUCCA MOUNTAIN, NYE COUNTY, NEVADA

Approach in FY 94 and Outyears:

- Unique Work--Specific work that is unique to Geochemical Assessment (i.e. not conducted under other Activities)

- Integrated Work--Integration of data and interpretations obtained in other Activities for utilization in Natural Resource Assessment

8.3.1.9.2.1 NATURAL RESOURCE ASSESSMENT OF YUCCA MOUNTAIN, NYE COUNTY, NEVADA

Integration with other Studies:

- Stratigraphic studies (USGS)
- Geologic mapping of zonal features (USGS)
- Mineralogy, petrology, and chemistry of transport pathways (LANL)
- Studies of calcite/silica deposits (USGS and LANL)
- Geophysical Studies (USGS)--Surface and Borehole

8.3.1.9.2.1 NATURAL RESOURCE ASSESSMENT OF YUCCA MOUNTAIN, NYE COUNTY, NEVADA

Integration with other Studies (continued)

- Tectonics and Structural Studies (USGS)
- Volcanic Studies (LANL)
- Heat Flow Studies (USGS)
- Unsaturated Zone Studies (USGS)
- Saturated Zone Studies (USGS)

8.3.1.9.2.1.1 GEOCHEMICAL ASSESSMENT
(Main Activity in FY 94)

Conceptual Model for Possible Mineralization:

- Miocene or younger hydrothermal systems
- Structural controlled flow (faults and fractures)
- Potential host rocks
  - Paintbrush Group and younger units
  - Crater Flat Group and older volcanic units
  - Paleozoic and Late Proterozoic sedimentary rocks

8.3.1.9.2.1.1 GEOCHEMICAL ASSESSMENT

Focus in FY 94:

- Isotopic and geochemical studies aimed at identifying and delineating zones of water-rock interaction within the rock mass at Yucca Mountain that may have derived from the circulation of hydrothermal fluids. Circulating mineralizing fluids would have left diagnostic "isotopic and geochemical" trails through the rock mass.

8.3.1.9.2.1.1 GEOCHEMICAL ASSESSMENT

FY 94 TASKS:

(1) Conduct $\delta^{18}O$ analyses of the Tiva Canyon Tuff. Water-rock interaction will lower primary $\delta^{18}O$ values of approximately +8 ($\pm$2) to values of 0 or less. Such interaction commonly produces "bullseye" zones of ^{18}O depletion (numerous case histories in literature):

- Systematic sampling of the Tiva Canyon caprock in the central block (100 to 150 samples)
- Analyses of bulk rock samples for $\delta^{18}O$ values
- Geochemical analyses for selected trace metals

FY 94 Tasks (Continued)

(2) Conduct isotopic (Pb, Sr, Nd, and O), geochemical, and petrographic studies of fault zones and other zones of potential fluid flow to search for exotic isotopic compositions that would be evidence of passage of hydrothermal fluids:

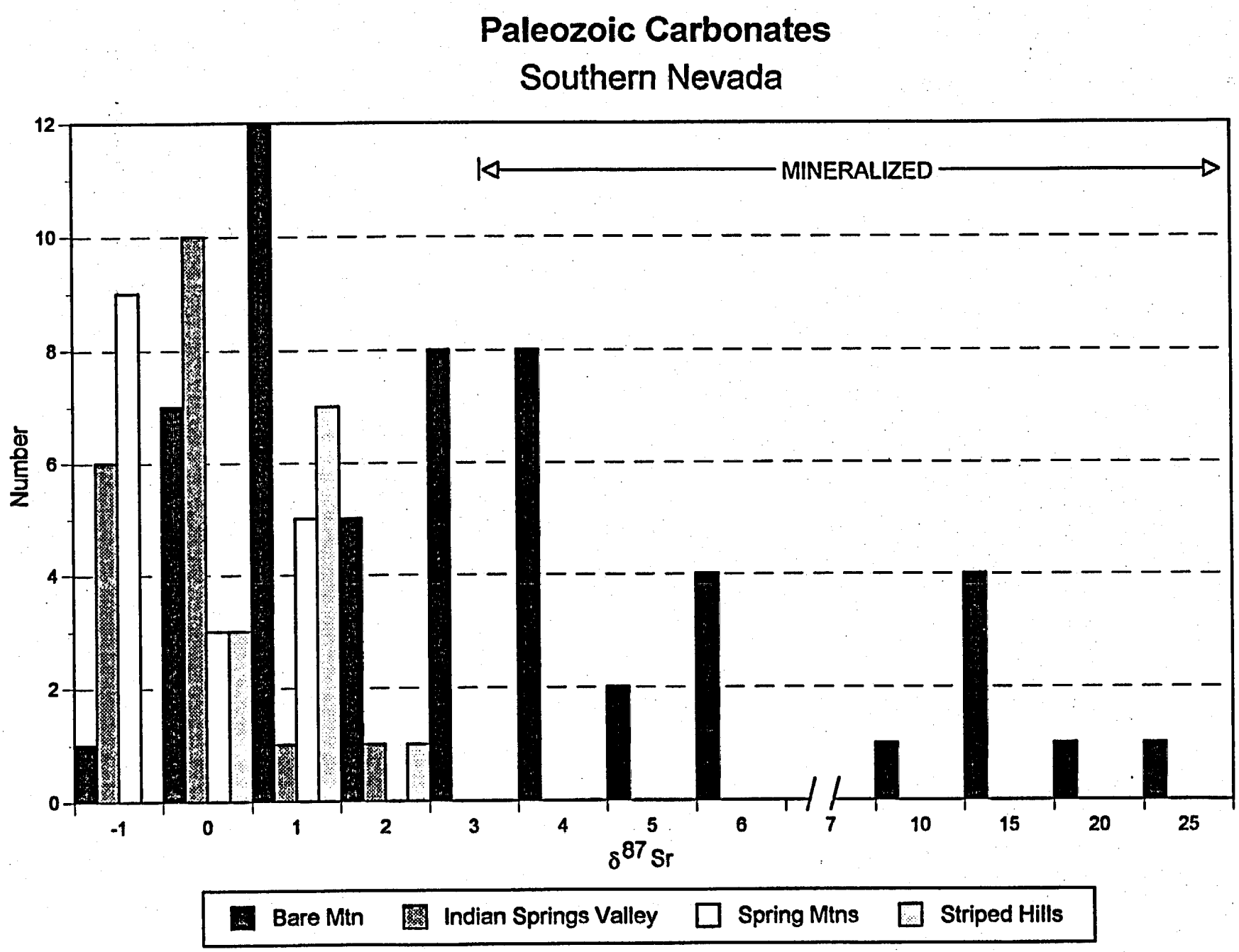
- Sample outcrops and drill cores for baseline data and for zones of possible hydrothermal fluid flow

- Possible sampling targets include the Bow Ridge fault (Trench 14 and Busted Butte) and the Ghost Dance fault (Antler and Whaleback Ridges), and sulfides in the Tram (drill core)

FY 94 Tasks (Continued)

(3) Conduct Sr and Pb isotopic study of mineralized and unmineralized Paleozoic and Late Proterozoic limestones. At Bare Mountain hydrothermal fluids responsible for gold mineralization caused major changes in primary Sr and Pb compositions of the host rocks. $^{87}Sr/^{86}Sr$ ratios were increased substantially and $^{206}Pb/^{204}Pb$ values were lowered.

- Collect and analyze samples from outcrops and from drill core (e.g. UE25 P#1)
- Field examination and collection of Calico Hills and Mine Mountain
- Develop conceptual model relevant to Yucca Mountain


Paleozoic Carbonates
Southern Nevada
MINERALIZED
Number
12
10
8
6
4
2
0
-1
0
1
2
3
4
5
6
7
10
15
20
25
δ87 Sr
Bare Mtn
Indian Springs Valley
Spring Mtns
Striped Hills

FY 94 Tasks (Continued)

(4) Conduct radiogenic isotope and trace metal study of ground water at Yucca Mountain. Ore bodies in the saturated zone impart distinctive isotopic and geochemical imprints on ground water which will be carried in a plume downgradient from the mineralized zone.

- Sample and analyze water from selected WT holes, J-12, J-13, VH-1, VH-2 and others.

- Analyze for Sr, Pb, and S. Emphasis on detectng anomalous compositions that might reflect interaction with buried mineral deposits.

FY 94 Tasks (Continued)

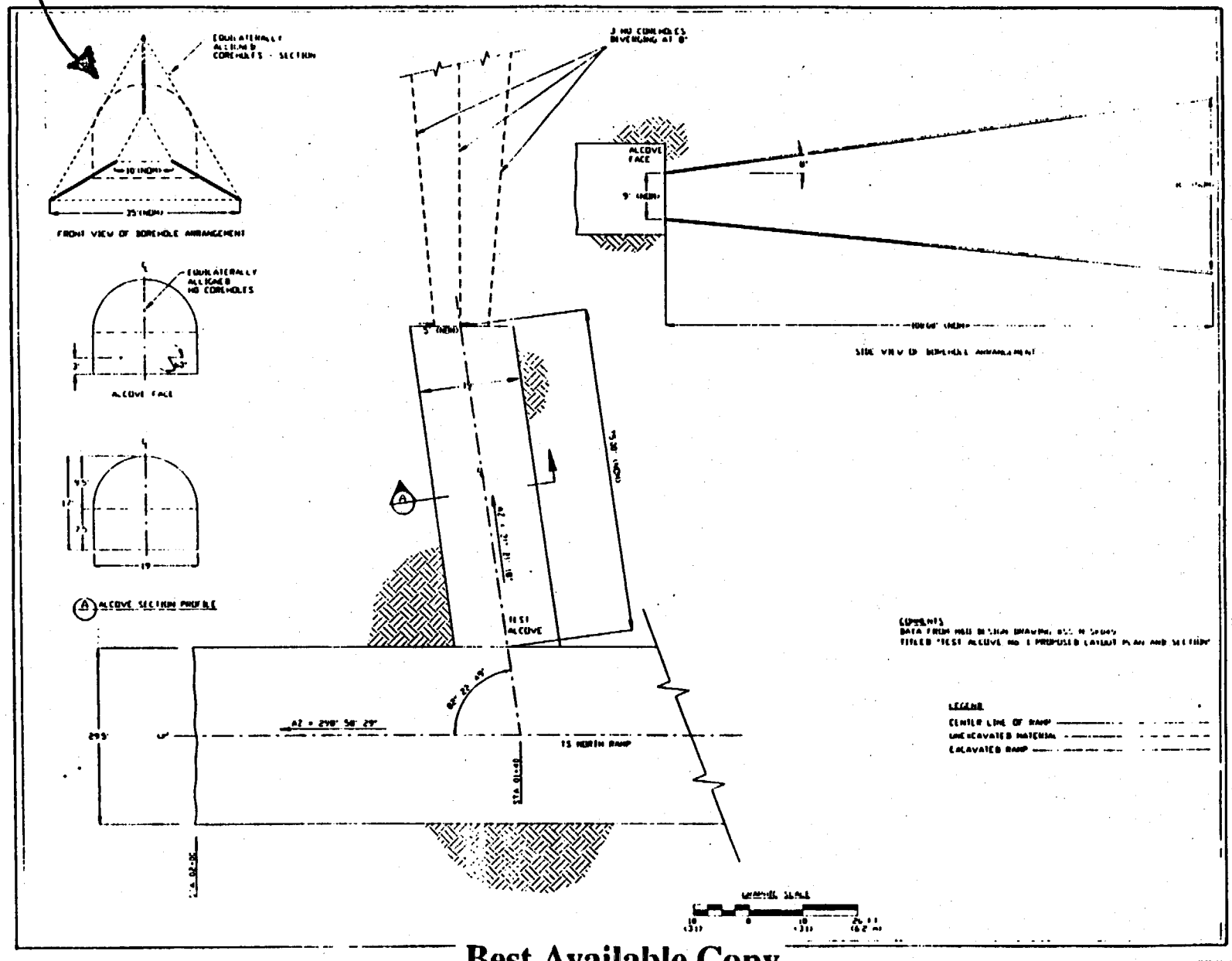
(5) Examine drill core with particular emphasis on detecting zones of alteration that could reflect the passage of mineralizing fluids. This task will supplement core logging currently being done within the Stratigraphic Studies Activity (8.3.1.4.2.1.1).

(6) Develop XRF techniques for transition metals such as Cu, Zn, Co, Sb, As etc) to supplement current suite of elements which are routinely analyzed (K, Ca, Ti, Rb, Sr, Y, Zr, Nb, Ba, La, Ce).

(7) Develop viable outyear program for Natural Resources Assessment.

BH arrangement subject to change.

Test Alcove #1
Proposed Layout Plan and Section



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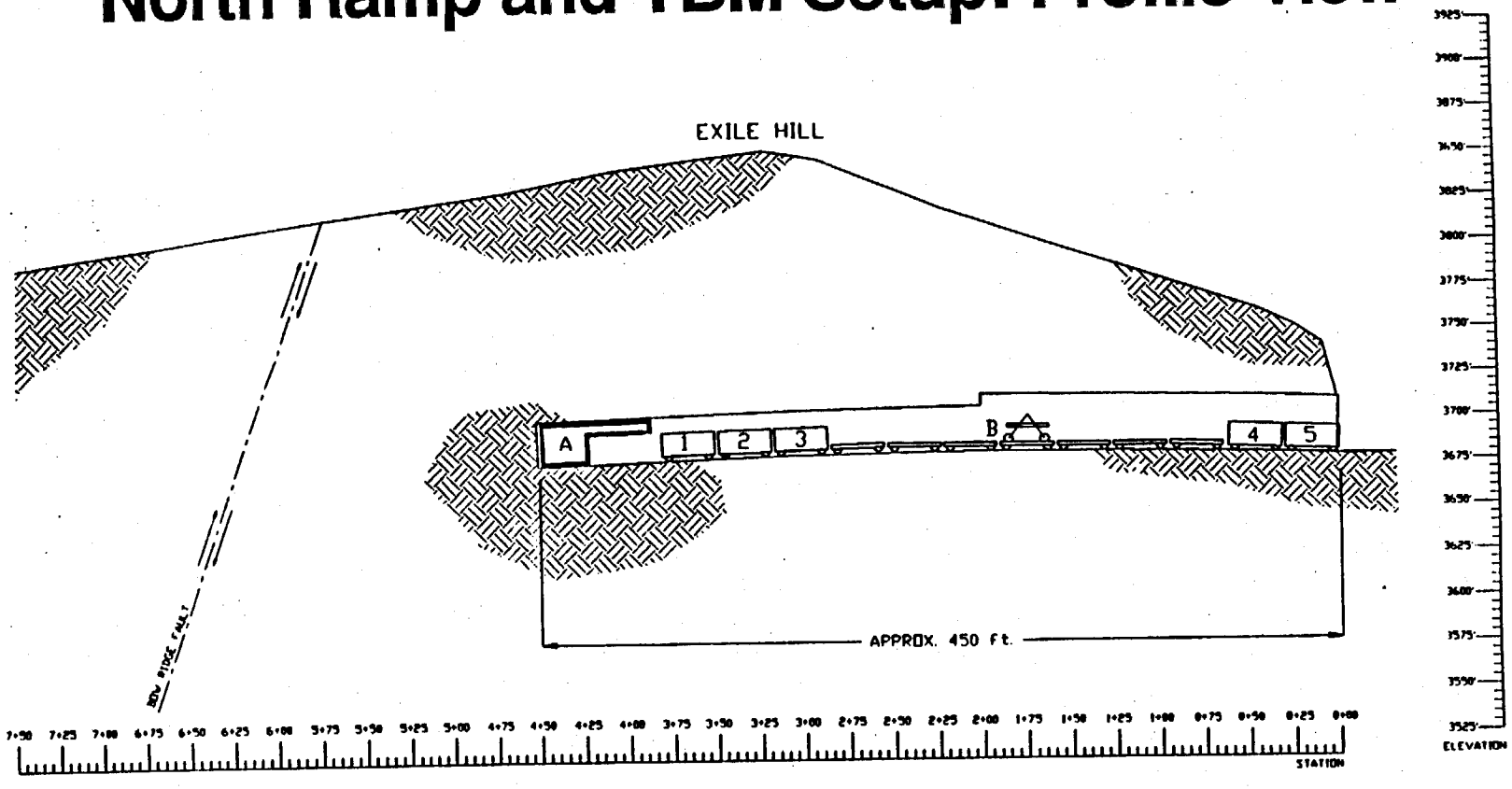
ENCLOSURE 3

North Ramp and TBM Setup: Profile View



LEGEND

FAULT ZONE
RAMP CONFIGURATION
EXISTING GROUND

COMMENTS

NORTH PORTAL BOX CUT FACE AT CS 0+00

ALCOVE 01 APPROXIMATELY LOCATED AT CS 1+40

TWO THOUSAND FEET GRID ENGLISH COORDINATES ARE BASED ON THE NEVADA STATE COORDINATE SYSTEM CENTRAL ZONE

DIMENSIONS AND ELEVATIONS ARE SHOWN IN FEET. FEET ARE ROUNDED TO ZERO DECIMAL PLACES. WHERE DISCREPANCIES BETWEEN ELEVATIONS AND GRADIENTS OCCUR DUE TO ROUNDING ELEVATIONS WILL GOVERN

STARTER TUNNEL CONFIGURATION AND AZIMUTH FOR THE FIRST 200 FT (60.960 m) IS BASED ON TITLE II PACKAGE 1A DESIGN DRAWINGS.

TOPOGRAPHY PROJECTION IS AN ESTIMATION CROSS SECTION TOPOGRAPHY TAKEN AT RAMP CENTER LINE

FAULT TRACE LOCATIONS, EXCEPT FOR THE BOW RIDGE FAULT, ARE APPROXIMATIONS BASED ON AT DEPTH PROJECTIONS OF INFORMATION FROM USGS OPEN FILE REPORT 84-494, PRELIMINARY GEOLOGIC MAP AND SECTIONS BY SCOTT AND BONK. THE BOW RIDGE FAULT TRACE IS AN AT-DEPTH PROJECTION BASED ON PRELIMINARY FIELD WORK FROM ON-GOING ROCK AND SOIL INVESTIGATIONS

TBM CONFIGURATION

A - CUTTER HEAD

CAR #	FUNCTION/CONTENTS
1	TRANSFORMERS, SPARE CUTTER RACK,
2	LUNCH ROOM, TOILET, FIRST AID ROOM
3	SHOP AREA

B - MAPPING PLATFORM ON TRAILING FLOOR SECTIONS

4	CABLE STORAGE, VENTLINE CARTRIDGE, CONVEYOR TAILPIECE,
5	ROCK BOLT, AND MISCELLANEADUS STORAGE

ESTIMATED TOTAL LENGTH = -450 ft.

GRAPHIC SCALE

40 (12.2) 0 40 (12.2) 80 ft. (24.4 m)

BEST AVAILABLE COPY

NZERPTPS9.125.NWTRB/10-19/20-93

ENCLOSURE 4

ENCLOSURE 5

UNITED STATES
NUCLEAR WASTE TECHNICAL REVIEW BOARD
1100 Wilson Boulevard, Suite 910
Arlington, VA 22209

Tentative Agenda

Full Board Meeting

Surface-Based Dry Drilling/Underground Testing Program

October 19-20, 1993

Plaza-Suite Hotel
4255 Paradise Road
Las Vegas, NV 89109
(702) 369-4400

Tuesday, October 19, 1993

8:30 A.M.	Welcome and Opening Remarks John Cantlon, Chairman Nuclear Waste Technical Review Board (NWTRB)
8:35 A.M.	Yucca Mountain Site Characterization Project Office (YMPO) Institutional Update Linda Smith, Acting Associate Director Office of Geologic Disposal
8:45 A.M.	YMPO Technical Progress Update Russel Dyer, Acting Project Manager
9:05 A.M.	Update on Fluid in UZ-14 Richard Luckey U.S. Geological Survey (USGS)
9:35 A.M.	BREAK (15 minutes)
9:50 A.M.	Update on the Exploratory Studies Facility (ESF) Program Daniel McKenzie Managment and Operating (M&O) Contractor — Morrison-Knudsen
10:10 A.M.	Nuclear Regulatory Commission (NRC) Concerns on ESF Design Control Joseph Holonich, NRC

Telephone: 703-235-4473 Fax: 703-235-4495

Tuesday, October 19, 1993 - continued

11:00 A.M.	State of Nevada Concerns on Pneumatic Testing Carl Johnson Nevada Nuclear Waste Project Office

DOE'S SITE CHARACTERIZATION TESTING PROGRAM: SURFACE AND UNDERGROUND

11:30 A.M.	Session Introduction Pat Domenico, NWTRB
11:35 A.M.	Framework of DOE's Site Characterization Testing Program Russell Dyer, YMPO
11:50 A.M.	Current Testing Program: Surface and Underground Dennis Williams, YMPO
12:05 P.M.	LUNCH

CURRENT SURFACE-BASED TESTING PROGRAM

1:00 P.M.	Nye County/DOE Cooperative Drilling Les Bradshaw, Nye County
1:15 P.M.	Status of Testing Activities in the Field Arch Girdley, DOE/YMPO
1:40 P.M.	Pneumatic Testing and ESF Construction Robert Craig, USGS
2:10 P.M.	BREAK (15 minutes)
2:25 P.M.	Systematic Drilling Program Update Christopher Rautman Sandia National Laboratories (SNL)
2:55 P.M.	Drilling Program Update Dennis Williams, YMPO
3:55 P.M.	Round-Table Discussion
5:00 P.M.	Recess Until Wednesday, October 20, 1993

Wednesday, October 20, 1993

CURRENT UNDERGROUND TESTING PROGRAM

8:30 A.M.	Session Introduction Ed Cording, NWTRB
8:40 A.M.	Review of Planned ESF Tests Ned Elkins Los Alamos National Laboratory (LANL)
9:15 A.M.	Characterization of the Yucca Mountain Unsaturated Zone in the ESF — SP 8.3.1.2.2.4 Michael Chornack, USGS
10:30 A.M.	BREAK (15 minutes)
10:45 A.M.	Thermal Testing Update Dale Wilder Lawrence Livermore National Laboratory
11:15 A.M.	ESF Testing & Test Locations Ned Elkins, LANL
11:45 A.M.	LUNCH
12:45 P.M.	Testing Program Coordination and Integration Thomas Statton M&O (Woodward Clyde Federal Systems)
1:30 P.M.	DOE Closing Remarks Russell Dyer, YMPO
1:40 P.M.	BREAK (15 min)
1:55 P.M.	Round-Table Discussion
3:55 P.M.	Final Comments and Adjournment John Cantlon, Chairman, NWTRB

LM-300 SAMPLING SYSTEM AT UZ-14

General Site Permits:

Air Quality Permit To Construct (Surface Disturbance) #2693

Water Appropriation Permits (Dust Control) #57373, #57374, #57375

#3 LM-300 DRILL RIG

SCP Study Plans:
8.3.1.2.2.1 Unsaturated Zone Infiltration
8.3.1.2.2.2 Water Movement Tracer Tests
8.3.1.2.2.3 Percolation In The Unsaturated Zone
8.3.1.2.2.6 Gas Phase Movement In The Unsaturated Zone
8.3.1.2.2.7 Unsaturated Zone Hydrochemistry
8.3.1.2.3.1 Saturated Zone Groundwater Flow System
8.3.1.2.3.2 Saturated Zone Hydrochemistry

Permits:
Waiver Request To Drill Into Water Table #MO-2263
Air Quality Permit To Construct (Cummins 600 HP) #2893
Air Quality Permit To Construct (Dust Collection) #3484

#6 CYCLONE/SAMPLE COLLECTOR

SCP Study Plans:
8.3.1.2.2.2, 8.3.1.2.2.3
8.3.1.2.2.7

Permit:
Air Quality Permit To Construct (Dust Collection) #3484

#4 CORE RODS

SCP Study Plans:
8.3.1.2.2.3
8.3.1.2.2.7
8.3.1.2.3.2

#2 AIR PROCESSING METER RUN

SCP Study Plans:
8.3.1.2.2.3
8.3.1.2.2.6
8.3.1.2.2.7

Permit:
Underground Injection Control (Tracer Injection) #NEV89031

#1 AIR COMPRESSORS

SCP Study Plans:
8.3.1.2.2.1, 8.3.1.2.2.2
8.3.1.2.2.3, 8.3.1.2.2.7

Permits:
Air Quality Permit To Constuct (2 Compressors Each) #3198 & #3199

#7 VACUUM SYSTEM

SCP Study Plans:
8.3.1.2.2.3
8.3.1.2.2.6

Permit:
Air Quality Permit To Construct (Dust Collection) #3484

#5 DUAL WALL DRILL PIPE

SCP Study Plans:
8.3.1.2.2.3
8.3.1.2.2.6

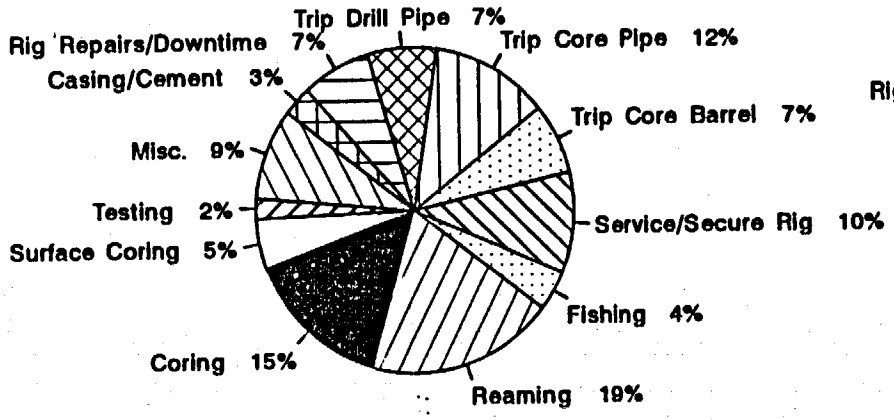
#8 SAMPLE MANAGEMENT TRAILER

SCP Study Plans:
8.3.1.2.2.1, 8.3.1.2.2.2,
8.3.1.2.2.3, 8.3.1.2.2.6,
8.3.1.2.2.7, 8.3.1.2.3.1,
8.3.1.2.3.2

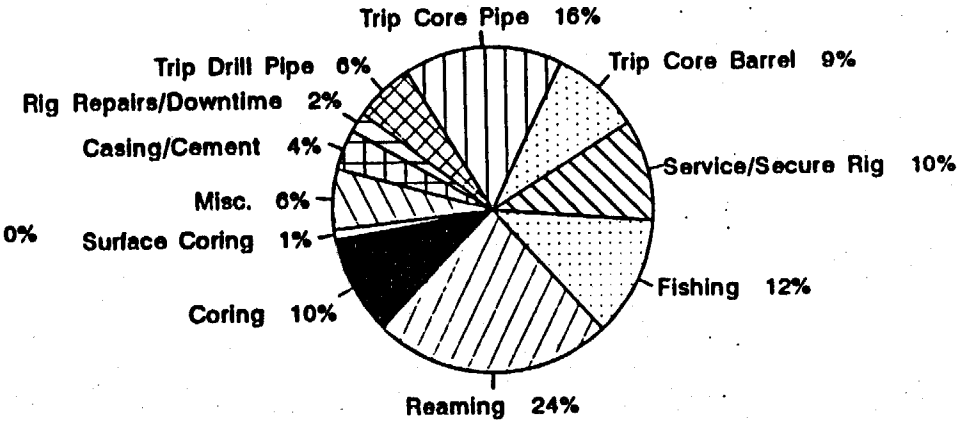
ENCLOSURE 6

UE-25 UZ-16 Versus USW UZ-14

Drill Rig = LM-300



UE-25 UZ-16
186 Shifts Total Rig Time
Total Footage = 1,686 Ft
Ft/8 Hr Shift = 9.1 Ft/Shift
Ft/Hr = 1.13 Ft/Hr



USW UZ-14
69 Shifts Total Rig Time
Total Footage = 1,182 Ft
Ft/8 Hr Shift = 17.1 Ft/Shift
Ft/Hr = 2.14 Ft/Hr

UZ-16 includes drilling through March 16, 1993 (Total Depth)
UZ-14 includes drilling through July 26, 1993 (1,182 Ft.)

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ENCLOSURE 7 ~

FY93 Geophysics Accomplishments at Yucca Mountain

- Geophysical Borehole Logging
  - UE-25 UZ-16 - Standard suite, seismic (Zero-offset) and VSP walkaway surveys, gravity and magnetics, neutron, prototype logs (RAAX, pulsed neutron, radar, geochemical), downhole video 7/22-8/12, 1993
  - USW NRG-6, UE-25 NRG-2 - slim-hole suite, seismic check-shot, Gyro, TV, (also, magnetics and VSP in NRG-6)
  - USW UZ-1 - Gyro survey (in preparation for drilling UZ-14 on same pad)
  - USW WT-2 - VSP profiling and zero-offset seismic, 8/23-8/25, 1993 (LBL)
  - Neutron logging on all N-holes and WT-2
  - Prototype crosshole seismic work at CSM in preparation for VSP in UZ-16

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ENCLOSURE 8

FY93 Geophysics Accomplishments at Yucca Mountain

(Continued)

- Seismic Refraction
  - Windy Wash fault (SW of proposed repository area)
- Gravity and Magnetics
  - Yucca Wash area (North of proposed repository area)
  - Midway Valley (East of proposed repository area)
- Geodetic Leveling
  - Completed re-survey of level lines (base station network); re-surveyed GPS base stations

FY93 Geophysics Accomplishments at Yucca Mountain

(Continued)

- **Seismic Monitoring**
  - Continuous 24-hour coverage in Southern Great Basin Seismic Monitoring Network
  - Seismic field experiment in Midway Valley (ground motion site response for ESF surface facilities design)
  - Mapping of precariously balanced rocks (from which is inferred past levels of ground-shaking)
  - Three new broad-band stations installed near Beatty to improve earthquake location parameters
  - Recording of non-proliferation experiment (NPE) on September 22, 1993, with numerous portable seismographs
- **Engineering Geophysical Tests on Rock Samples**
  - Determined for North Ramp core samples in surface facilities areas

FY94 Planned Geophysics at Yucca Mountain

(Continued)

- Geophysical Borehole Logging
  - UZ-14: 4- or 6-arm caliper, gravity, video, gyro, dual induction, sidewall neutron, NPLT; possibly dielectric log, magnetics, velocity check shot, neutron moisture, prototype logging 11/93-12/93
  - UE-25 UZ-16: VSP reconnaissance survey with grouted-in 96-geophone string
  - NRG-2, -2a, -2b, -3, -4, -5, -6, and -7: Resistivity, gamma, density, neutron, gyro, video, caliper 10/93-11/93
  - WT-2: Resistivity, gamma, density, neutron, caliper, video, gyro deviation 10/93; also, heat flow
  - WT- and G-holes: Heat-flow surveys in about 30 boreholes
  - SD-12: Phased logging possible above and below WT; similar logs to those at UZ-14

FY94 Planned Geophysics at Yucca Mountain

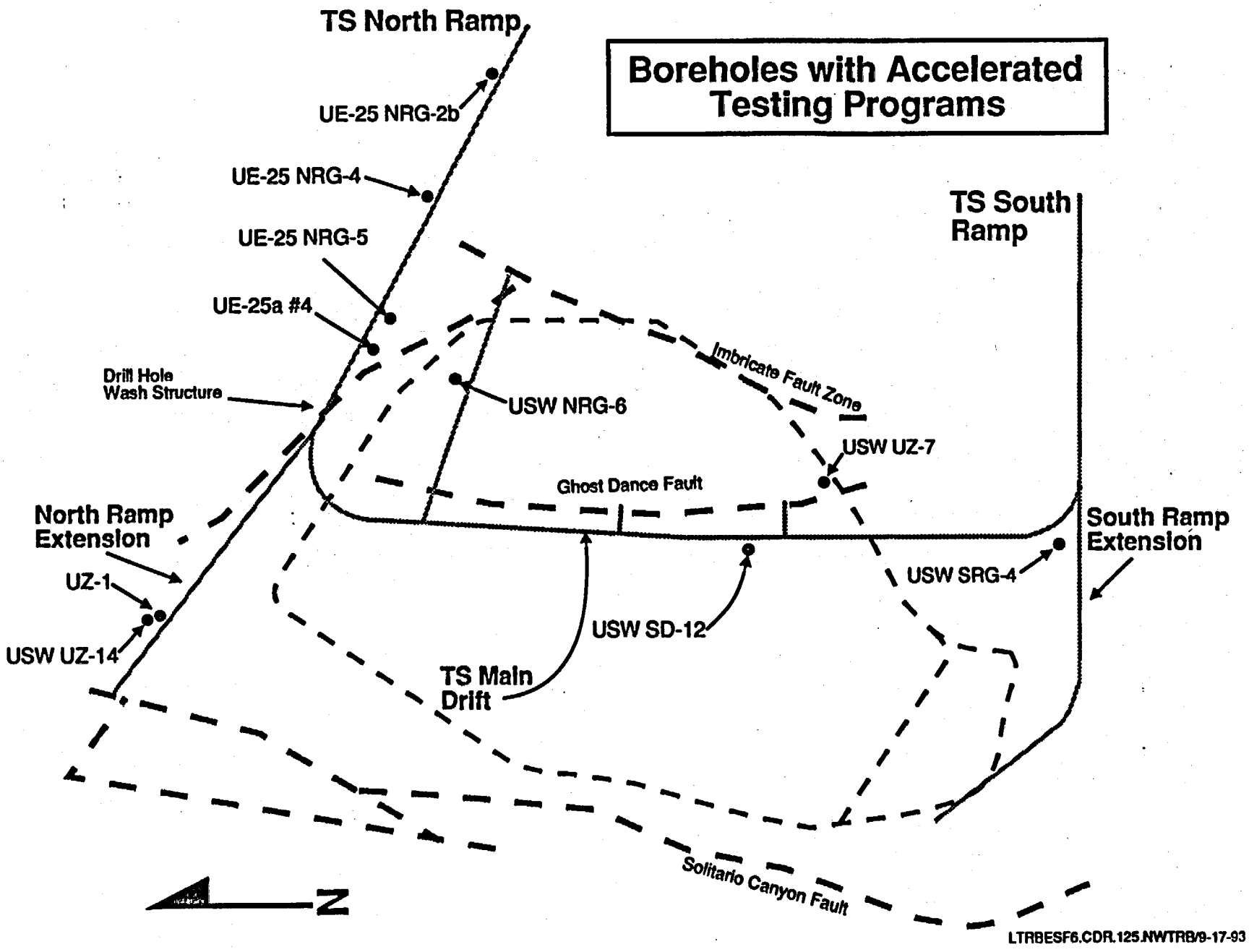
(Continued)

- **Seismic Reflection**
  - Between WT-2 and UZ-16, in support of ESF main drift design (LBL)
  - Possible NW-SE line through Drill Hole Wash, in support of ESF north ramp design (LBL)
  - Possible survey along Yucca Crest Road, in support of faulting studies (LBL)
- **Seismic Monitoring**
  - Continuous 24-hour coverage in Southern Great Basin seismic monitoring network
  - Mapping of precariously balanced rocks (from which is inferred past levels of ground-shaking)

FY94 Planned Geophysics at Yucca Mountain

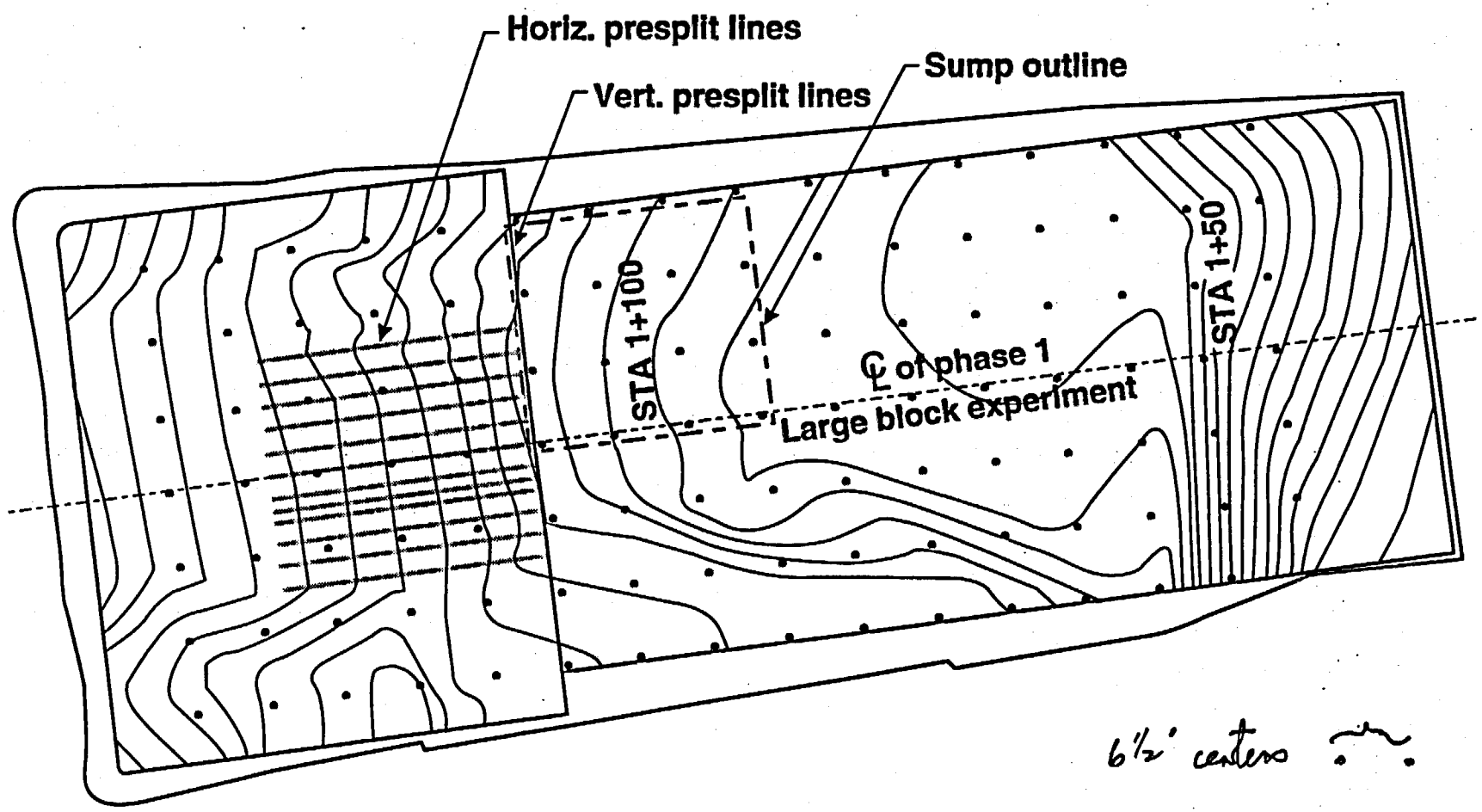
(Continued)

- Geodetic Leveling
  - Analyses of leveling data collected in FY93
- Engineering Geophysical Tests on Rock Samples
  - Determined for North and South Ramp core samples, surface facilities areas (SNL)
  - Unspecified geophysical tests in the North Ramp and alcoves (LANL; LLNL); possibly to include laser-induced breakdown spectroscopy


Boreholes with Accelerated Testing Programs
TS North Ramp
UE-25 NRG-2b
UE-25 NRG-4
UE-25 NRG-5
UE-25a #4
Drill Hole Wash Structure
USW NRG-6
Imbricate Fault Zone
USW UZ-7
Ghost Dance Fault
TS South Ramp
North Ramp Extension
UZ-1
USW UZ-14
USW SD-12
TS Main Drift
USW SRG-4
South Ramp Extension
Solitario Canyon Fault
N
LTRBESF6.CDR.125.NWTRB/9-17-93

ENCLOSURE 9

Excavation Plan Large Block Test



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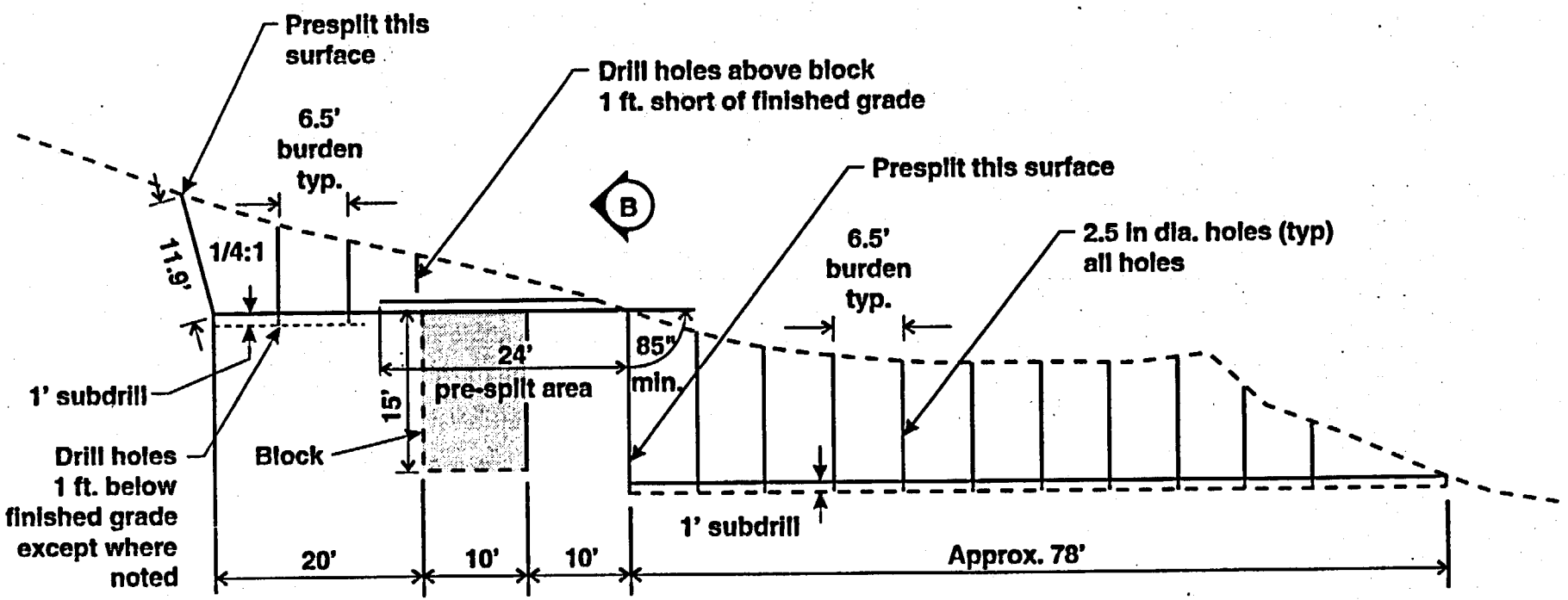
ENCLOSURE 10A

Cross Section of Excavation Plan



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ENCLOSURE 10B