

**U.S. DEPARTMENT OF ENERGY
OFFICE OF CIVILIAN RADIOACTIVE WASTE MANAGEMENT**

**NUCLEAR WASTE TECHNICAL REVIEW BOARD
FULL BOARD MEETING**

**SUBJECT: REVIEW OF PRELIMINARY TEST
PLANNING AND STATUS OF TESTING
IN THE EXPLORATORY STUDIES
FACILITY**

PRESENTER: NED Z. ELKINS

**PRESENTER'S TITLE
AND ORGANIZATION: DEPUTY TECHNICAL PROJECT OFFICER
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**LAS VEGAS, NEVADA
OCTOBER 19-20, 1993**

Principal Elements of Exploratory Studies Facility (ESF) Test Program Development

- 1. Initial (preliminary) definition of test program activities**
- 2. Consolidation and prioritization of tests**
- 3. Incorporation of high-level test criteria and requirements into facility designs and construction plans**
- 4. Detailed test planning, sequencing, and field preparation**
- 5. Field implementation and iteration**

Preliminary Definition of Exploratory Studies Facility (ESF) Testing Program

- **Following completion of ESF Alternatives Study (1989-1990), the Yucca Mountain Site Characterization Project Office developed preliminary ESF Test Planning Document, TPP 91-5, “Planned Exploratory Studies Facility Tests”**
 - **Lead coordination provided by ESF Test Coordination Office (TCO)**
 - **Input developed and verified by ESF test organizations**
 - **U. S. Geological Survey**
 - **Sandia National Laboratories**
 - **Lawrence Livermore National Laboratory**
 - **Los Alamos National Laboratory**
- **Initiation of various evaluations to streamline and sequence subsurface test program**
- **Complete revision of high-level facility design requirements (ESFDR, Appendix B)**

Review of Preliminary Planning

- **Initial test planning (TPP 91-5) defined 42 ESF test activities ranging from design verification and excavation monitoring, through sampling and small-scale test activities, to large-scale *in situ* testing**
- **Results of initial ESF test planning is fully consistent with and represented by current Site Characterization Program Baseline (SCPB)**
- **ESF test program objectives and scope were provided to the NRC in Semiannual Progress Report #4**

Current ESF Testing Status

Five test programs are currently fielded in the ESF (SCP Activities 8.3.1.4.2.2.4; 8.3.1.2.2.4.7; 8.3.1.3.2.1 and .2; 8.3.1.15.1.8.1 and .2; 8.3.4.2.4.4)

- **Geologic mapping**
- **Perched water (contingency)**
- **Consolidated sampling**
- **Construction monitoring**
- **Fran Ridge large block experiment**

Current ESF Testing Status

(Continued)

Two *in situ* test activities are fully planned and ready to implement in ESF North Ramp Alcove #1 (SCP Activities 8.3.1.2.2.4.4; 8.3.1.2.2.4.8)

- **Hydrochemistry testing**
- **Radial borehole testing (anisotropy)**

Three construction-phase tests first appearing in north ramp either at or beyond the Bow Ridge Fault are scheduled for planning completion by Fall 1993 (Package 2C) (SCP Activities 8.3.1.2.2.4.10; 8.3.1.15.1.1, .2, .3 and .4; 8.3.1.15.1.5.1)

- **Hydrologic properties of major faults**
- **Laboratory thermal properties**
- **Excavation investigations**

Prioritization and Sequencing of ESF Tests

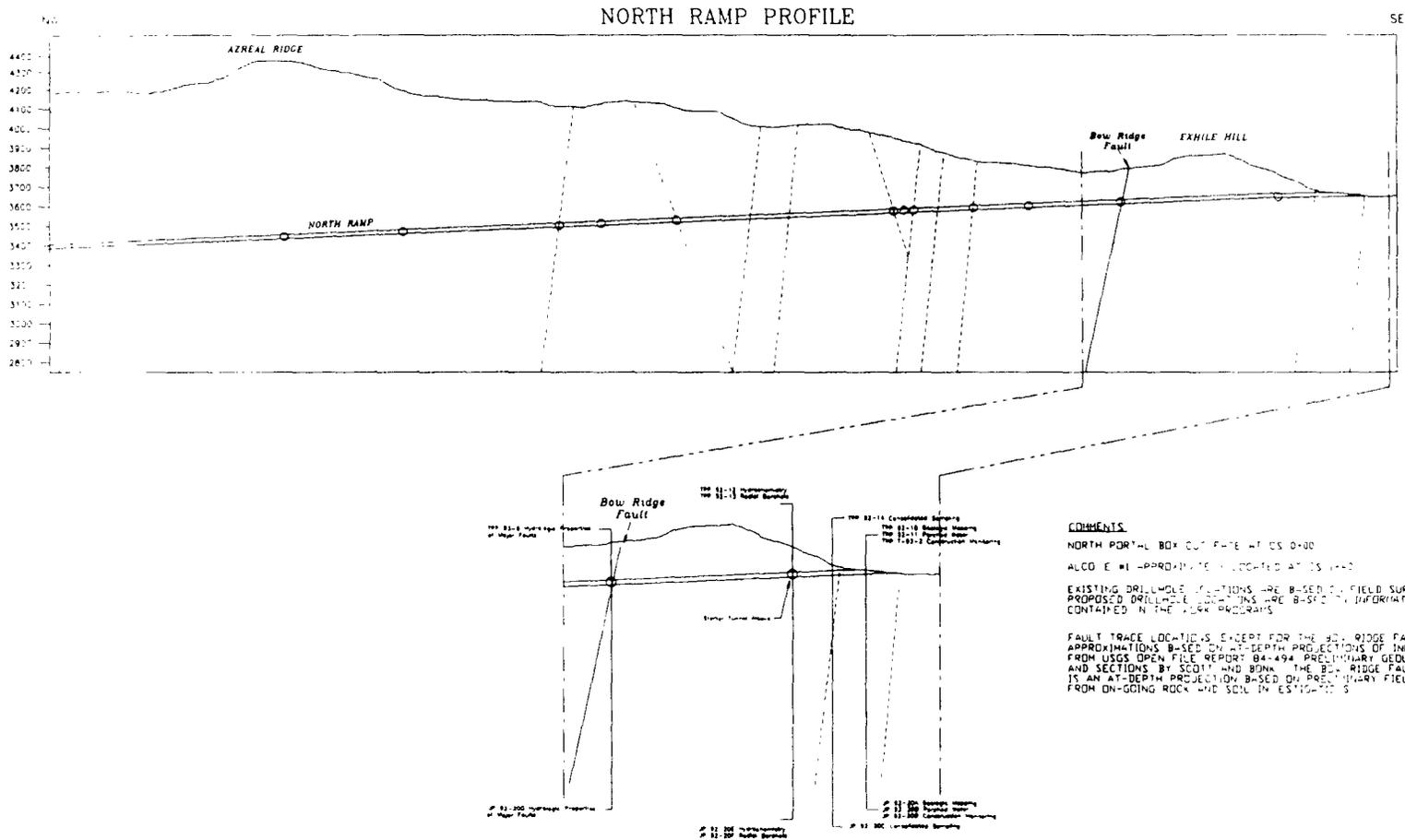
Tests are sequenced to support Yucca Mountain Site Characterization Project strategies for issue resolution and program prioritization

- **Integrated test evaluation (site) program**
- **Long-range characterization program planning**
- **YMP annual planning (near-term prioritization and resource planning)**

Final prioritization based on ability to defer tests

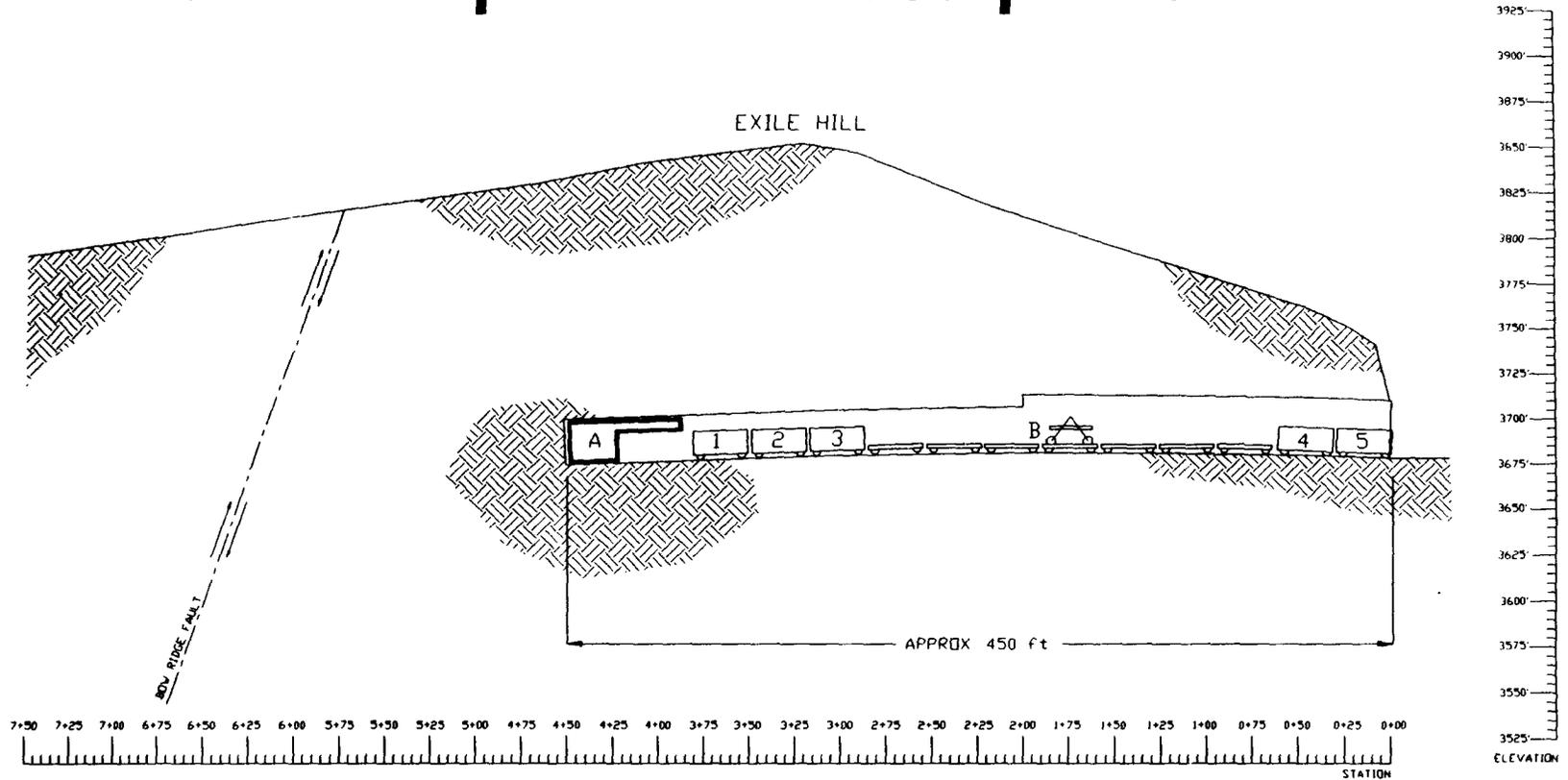
- **Irretrievable data**
- **Determination of site suitability**
- **Specific test and monitoring durations**

North Ramp Explosion and Package Implementation



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North Ramp and TBM Setup: Profile View



LEGEND

- FAULT ZONE -----
- RAMP CONFIGURATION -----
- EXISTING GROUND -----

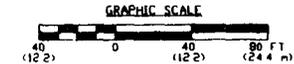
COMMENTS

NORTH PORTAL BOX CUT FACE AT CS 0+00
 ALCOVE #1 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 APPROXIMATELY BASED ON AT-DEPTH PROJECTIONS OF INFORMATION FROM USGS OPEN FILE REPORT 84-494, PRELIMINARY GEOLOGIC MAP AND SECTIONS BY SEDIT AND BOW. THE BOW RIDGE FAULT TRACE IS AN AT-DEPTH PROJECTION BASED ON PRELIMINARY FIELD WORK FROM ON-GOING ROCK AND SOIL INVESTIGATIONS

TBM CONFIGURATION

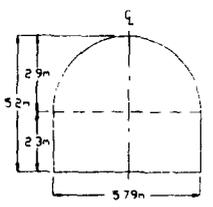
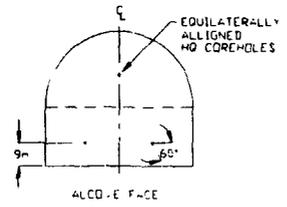
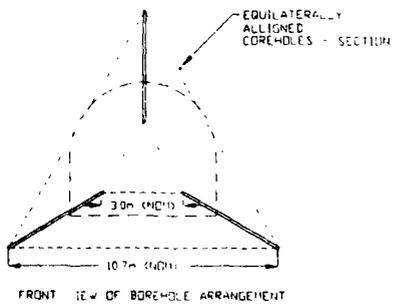
- A - CUTTER HEAD
- | CAR # | FUNCTION/CONTENTS |
|-------|------------------------------------|
| 1 | TRANSFORMERS, SPARE CUTTER RACK. |
| 2 | LUNCH ROOM, TOILET, FIRST AID ROOM |
| 3 | SHOP AREA |
- B - MAPPING PLATFORM ON TRAILING FLOOR SECTIONS
- | | |
|---|--|
| 4 | CABLE STORAGE, VENTLINE CARTRIDGE, CONVEYOR TAILPIECE. |
| 5 | ROCK BOLT, AND MISCELLANEOUS STORAGE |

ESTIMATED TOTAL LENGTH = -450 ft.

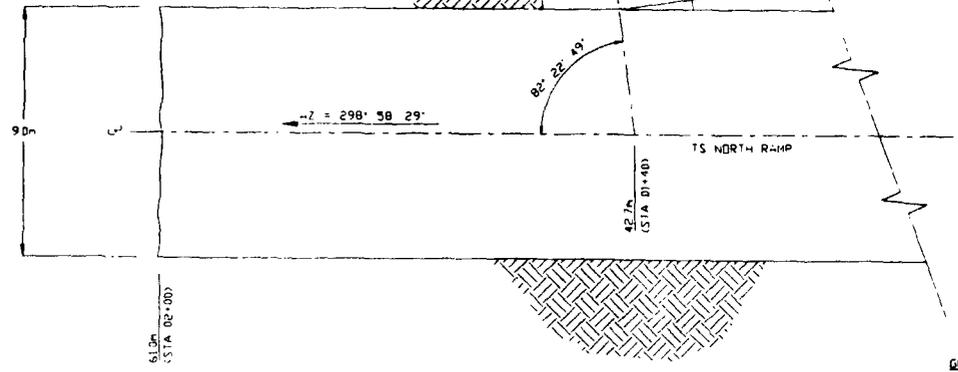
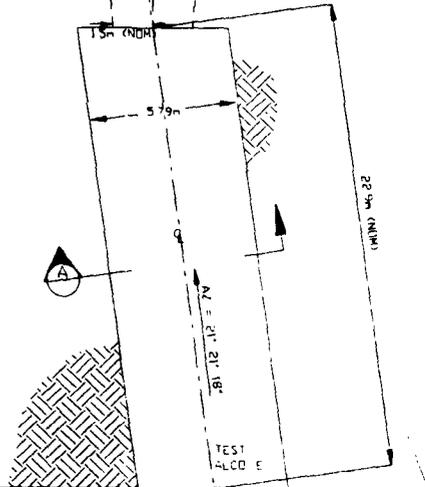
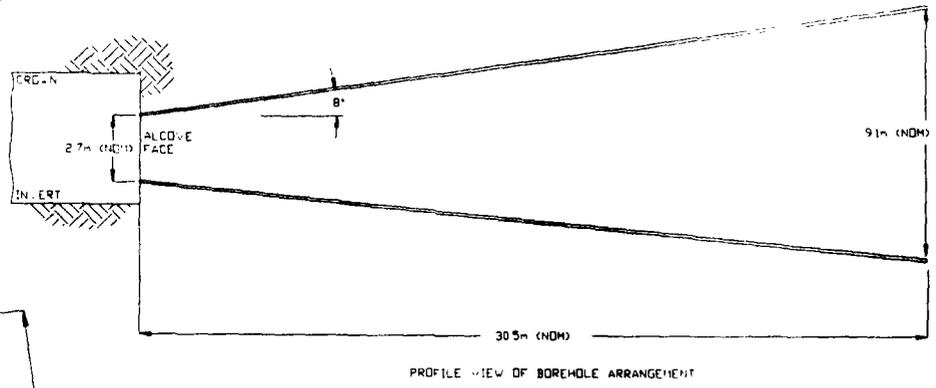
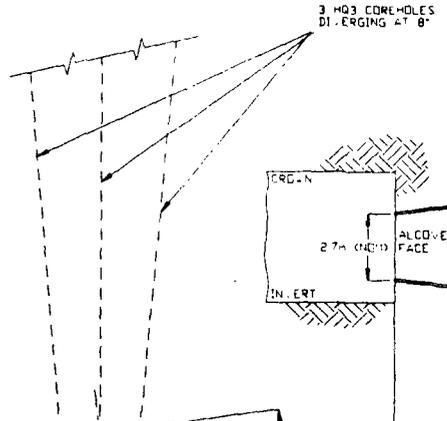


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Test Alcove #1: Proposed Layout Plan and Section



A - ALCOVE SECTION PROFILE



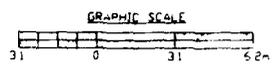
COMMENTS
DATA FROM MLD DESIGN DRAWING #55-11-54649
TITLED "TEST ALCOVE NO. 1 PROPOSED LAYOUT PLAN AND SECTION"

LEGEND

CENTER LINE OF RAMP

UNEXCAVATED MATERIAL

EXCAVATED RAMP



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