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"QA N/A"  
WBS 1.2.6.1.1

ESF TEST COORDINATION OFFICE WORK PLAN

GEOLOGIC MAPPING OF THE RAMPS, MTL  
DRIFTS, AND ALCOVES

Work Plan ID: WP 92-20A, Rev. 08/10/94  
(Administrative Only)

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**GEOLOGIC MAPPING OF THE RAMPS, MTL DRIFTS, AND ALCOVES**

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**GEOLOGIC MAPPING OF THE RAMPS, MTL DRIFTS, AND ALCOVES**

This work plan (WP) implements and operates within the constraints and requirements established in the current versions of Test Planning Package (TPP) 92-10, Job Package (JP) 92-20A and guides field interactions. This WP will be revised as necessary by the Test Coordination Office (TCO) and changes will be communicated to all participants identified herein.

This WP has been prepared to facilitate work to be conducted in the field. This plan has been reviewed (1) to ensure that it is fully consistent with the controlled requirements basis represented in TPP 92-10 and JP 92-20A, and (2) to ensure that it contains no quality affecting requirements. The WP does provide a planned method to meet requirements in the TPP and JP listed above. Any anticipated deviations from this plan should be brought to the immediate attention of the TCO. The TCO will ensure that proposed changes are evaluated to determine consistency with the requirements basis. Approved changes will be documented by the TCO prior to proceeding with the work. If changes are determined to be inconsistent with the requirements basis, work will not proceed until inconsistencies are resolved.

The following activities will be performed in support of the listed tests:

**1. PROJECT SCHEDULING AND COORDINATION**

- 1.1 The U.S. Department of Energy (DOE) Field Test Coordinator (FTC), the Exploratory Studies Facility (ESF) TCO, the Reynolds Electrical and Engineering Co., Inc. (REECo) Construction Department Manager (CDM), the Test Survey Coordinator (TSC), the Photo Support section leader (PS), the Civilian Radioactive Waste Management System Management & Operating (CRWMS M&O) Contractor Construction Manager (CM), and the Principal Investigator (PI), or designee, will mutually review and accept the WP and any subsequent LANL revision and will mutually agree upon a tentative schedule, implementation methods, and representative or approval authority for the work described below.

Organizational Participant Representative Signatures:

FTC	<u>W. A. Hirdley</u>	Date	<u>8/10/94</u>
TCO FTR	<u>McLard B. Kavan</u>	Date	<u>8/5/94</u>
CM	<u>Rand C. McDanel</u>	Date	<u>8/8/94</u>
CDM	<u>Tom Howard</u>	Date	<u>8/5/94</u>
TSC	<u>Joe E. Watson</u>	Date	<u>8/5/94</u>
PS	<u>Ronald E. Thompson</u>	Date	<u>8-7-94</u>
PI	<u>Jim C. Beane</u>	Date	<u>8-10-94</u>

The ESF TCO Field Test Representative (FTR) and the Project Engineer (PE) for this activity have been delegated by signature of the DOE FTC above to authorize the initiation of

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procurement or the initiation of tasks required by the planning package records as necessary to support the contractors' procedural requirements for the Yucca Mountain Site Characterization Office (YMSCO). Attachment 1 of this WP presents the recommended format to accomplish this communication. Attachment 3 of this WP provides the point of contact list for this activity.

### **2. GENERAL INSTRUCTIONS**

#### **2.1 GEOLOGIC MAPPING ADMINISTRATIVE PROCEDURES**

Attachment 2 of this work plan presents the recommended format to administratively document areas that have been mapped. This form will be made available to the CM to keep the CM informed of mapping activities and any special construction related instructions or restrictions that result from geologic mapping behind the Tunnel Boring Machine (TBM).

#### **2.2 ESTABLISH CONSTRUCTION EXCLUSION AREA**

The CM will provide effective means acceptable to the TCO FTR/PI or designee to ensure the safety, accessibility, and continued functioning of each completed test installation until notice of test completion. A construction exclusion area may be established around instrument locations.

### **3. GEOLOGIC MAPPING ACTIVITY**

#### **3.1 GEOLOGIC MAPPING SCENARIOS**

Four Geologic Mapping scenarios are currently being considered for mapping in the ESF, all of which shall be accomplished using the following administrative steps:

- 1) Mapping and sample collection activities on the TBM from and behind the tail shield in the ramps and main drift,
- 2) Mapping and sample collection activities behind the TBM from the mapping gantry (on the TBM Trailing Decks) in the ramps and main drift,
- 3) Mapping and sample collection in the ramps, mains and ramp extensions using a man-lift or other means of access, and
- 4) Mapping and sample collection in the alcoves, refuge chambers, and main drift will be carried out using a man-lift or other means of access. The Geologic Mapping Session form shall communicate and define the spatial limits of the mapping session or sessions. Mapping activities that directly support the collection of construction ground support criteria will be conducted concurrent with TBM operations. Attachment 2 of this WP presents the recommended format to accomplish and administratively document mapping sessions.

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**3.2 MAPPING SESSION REQUEST**

The TCO FTR and PI or designee will determine when the PI or designee is ready to start a mapping session.

**3.3 MAPPING SESSION AUTHORIZATION**

The geologic mapping activity will be conducted as a part of daily TBM operations and shall be coordinated with the TCO FTR, CDM, CM, and PI or designee. Mapping of rock surfaces will be done prior to the application of ground stabilization such as shotcrete or reinforcing fabric, or any other material which would adversely affect the mapping activity.

**3.4 SECTION CLEANING**

The Constructor will scale and blowdown the loose material and dust from the selected rock surfaces. The PI or designee will indicate to the Constructor when the surface is cleaned satisfactorily.

**3.5 GANTRY/MAN-LIFT OPERATION**

At the time and location for the mapping activity, the Constructor will have available a self-propelled man-lifting platform and operator approved for use by the PI or designee, suitable for the support of the mapping activity. The TCO will ensure that laser alignment and photography support are provided. The TCO will ensure that the survey control for mapping and laser alignment is equivalent to that specified in the TPP. The Constructor will supply utilities at the mapping site.

**3.6 LIMITED ACCESS CONSTRAINT**

At the direction of the PI or designee, the Constructor may have to remove nonessential personnel from the immediate mapping area.

**3.7 MAPPING ACTIVITY**

The PI or designee will direct, participate in, and witness the mapping and photography in accordance with approved procedures.

**3.8 SESSION COMPLETION NOTIFICATION**

The PI or designee will notify the TCO FTR when the daily mapping session is completed. The TCO FTR will provide a written summary of the area mapped and areas that are to remain open for future testing to the CM/CDM and FTC. Attachment 2 of this WP presents the recommended format for this communication.

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- 3.8.1 The TCO FTR will ensure that the mapping session activity is supported and completed to the satisfaction of the PI or designee.
- 3.8.2 The TCO FTR will advise the Constructor that support equipment can be removed.

**3.9 SESSION SUMMARY REPORT RECORD**

REECo will submit the following information to the Document Records Center (DRC) file (DRC-037):

- A) a report of underground spills of fuels, lubricants and coolants;
  - B) records of underground fuel use by class of equipment; and
  - C) a record of volume of water and tracers, fluids, and materials used underground.
- 3.9.1 REECo will notify the FTC and TCO FTR of any noncompliance or known problems during any mapping session.
  - 3.9.2 Geologic Mapping information has been requested by the ESF designer for Title II and Title III ESF designs. Mapping information will be transmitted to the CRWMS M&O Title II and Title III field engineers in accordance with the Test Planning and Job Packages. The format and frequency of submittals will be determined by the PI or designee, CRWMS M&O A/E, and the TCO FTR.

**3.10 TRANSMIT RELEASE TO CONSTRUCTION**

The TCO FTR in coordination with the PI or designee, will provide a written "Release to Construction" to the CM after mapping is complete.

**3.11 SESSION RECORD SUBMISSION**

The following organizations will make submissions to the DRC file (tracking number DRC-095):

- A) RSN will submit survey data, notes and plots;
- B) the Sample Management Facility (SMF) will submit sample transmittal forms; and
- C) Johnson Controls will submit photo mission forms and photo transmittal records.

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**3.12 ADMINISTRATIVE SUPPORT INFORMATION**

The TCO will submit a weekly activity report to the FTC. The report will include the identification of any conditions that affect data gathering.

**3.13 CONSTRUCTION SUPPORT INFORMATION**

The TCO will ensure that preliminary mapping information gathered by the PI or designee and requested by the CM for use in ground support detailing will be provided to the CM.

**4. SAFETY**

4.1 The DOE YMSCO Assistant Manager for Environment, Safety and Health, (AMESH) has assigned underground construction and mining safety to the Constructor (REECo). The TCO recognizes and endorses this action. The TCO will, as required, coordinate planned scientific activities to comply with the Constructors concerns for safety and perform/direct these scientific activities to proceed after full consultation with the Constructor as to safety status.

4.2 Safety responsibilities are identified in the "Work Plan Safety Analysis," Attachment 4.

**5. REPORTING RESPONSIBILITIES**

5.1 The TCO will submit a weekly activity report to the FTC. The report will include the identification of any conditions that affect data gathering.

5.2 The TCO will submit a monthly status report to the FTC and will submit a copy to DRC-095. Copies of construction exclusion area forms will be attached to the monthly report.

5.3 The Constructor will provide to the appropriate DRC file (tracking number DRC-037) and to the TCO the following information:

- A) report of underground spills of fuels, lubricants and coolants;
- B) records of underground fuel use by class of equipment; and
- C) a record of volume of water and tracers, fluids, and materials used underground.

REECo will notify the FTC and TCO FTR of any noncompliance or known problems during any mapping session.

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- 5.4 The following organizations will make submissions to the DRC file (tracking number DRC-095):
- A. RSN will submit survey data, notes and plots;
  - B. the SMF will submit sample transmittal forms; and
  - C. Johnson Controls will submit photo mission forms and photo transmittal records.
- 5.5 The PI or designee will notify the ESF FTR in writing that the field portion of the activity is complete and will provide status of associated milestones and commitments.

**6. VERIFICATION**

- 6.1 No independent verification is required for activities in this WP.

**7. WORK PLAN CLOSE OUT**

- 7.1 At the conclusion of the field activity, the TCO will submit a close out report under JP 92-20A.
- 7.2 Concurrence from Job Package Records Coordinator (JPRC) that record package turnover requirements have been met.

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

**8. CONCURRENCE OF THE COMPLETION OF THE WORK PLAN**

- 8.1 PI or Designee

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

- 8.2 ESF TCO Representative

Signature: \_\_\_\_\_ Date: \_\_\_\_\_

- 8.3 YMSCO-Assistant Manager for Site Programs (AMSP) FTC

Signature: \_\_\_\_\_ Date: \_\_\_\_\_



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**ATTACHMENT 1**

**REQUEST FOR WORK ORDER MODIFICATION  
2 Pages**



**Reynolds Electrical & Engineering Co., Inc.**  
**YUCCA MOUNTAIN PROJECT**  
**REQUEST FOR WORK ORDER MODIFICATION**

Date: \_\_\_\_\_ Station No.: \_\_\_\_\_

Work Order No.: \_\_\_\_\_ Work Order Modification No.: \_\_\_\_\_

To: REECo YMP Project Control Department

From: \_\_\_\_\_  
REQUESTOR \_\_\_\_\_ ORG. \_\_\_\_\_

Detail Scope of Work:

Attachment/Reference Documents:

Estimated By: \_\_\_\_\_ Date: \_\_\_\_\_

LABOR	MATERIAL	EQUIPMENT	OTHER	TOTAL

DOE Representative \_\_\_\_\_ Date \_\_\_\_\_ CLD Representative \_\_\_\_\_ Date \_\_\_\_\_

Check for Distribution:

☐ REECo YMP  
☐ REECo YMP Construction Department  
☐ REECo YMP Drilling Department  
☐ REECo YMP P.P. & B.

☐ DOE/YMSOO  
☐ DOE/YMP  
☐ ESF/TCO-SITE  
☐ ESF/TCO-LV  
☐ PI

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**GEOLOGIC MAPPING OF THE RAMPS, MTL DRIFTS, AND ALCOVES**

**ATTACHMENT 2**

**GEOLOGIC MAPPING SESSION NOTIFICATION**

**2 Pages**

## Geologic Mapping Session Notification (Administrative Form)

Geologic Mapping Session Request Reference

Request #

Test Planning Package	Job Package	WBS Element ID	Principal Investigator

Issued By \_\_\_\_\_ Organization/Date \_\_\_\_\_ / \_\_\_\_\_

Job Package Concurrence / Date \_\_\_\_\_ / \_\_\_\_\_

Spatial Extent of Session(s): \_\_\_\_\_

☐ Mapping Gantry    ☐ TBM Shield     Alcove ID    ☐ Drifts or Extension
From Construction  
Station Station

To Construction

Geologic Mapping Session DescriptionLayout / Location SketchLocation Survey Description

CS plus Offset: \_\_\_\_\_

Field Note ID's: \_\_\_\_\_

Survey Engineer: \_\_\_\_\_

Survey Organization: \_\_\_\_\_

Supplemental Data

Photo Set ID's: \_\_\_\_\_

Photographer: \_\_\_\_\_

Comments: \_\_\_\_\_

Other Photo's (List Reference): \_\_\_\_\_

Provide Sufficient Detail for Sketch of Major Features

Controlling Procedures and Records

Test Procedure ID and Title: \_\_\_\_\_

Scientific Notebook ID and Title: \_\_\_\_\_

Comments or Restrictions: \_\_\_\_\_

This form constitutes a preliminary administrative record of the Geologic Mapping activities. The form is to be completed by the responsible PI or designee and provided to the TCO Field Test Representative as a part of the Data collection process.

Distribution: ESF/TCO Project Engineer, EES-13/LV \_\_\_\_\_  
 ESF/TCO Field Test Representative, EES-13/FOC \_\_\_\_\_  
 ESF/TCO Records Coordinator, EES-13/LV \_\_\_\_\_  
 Field Test Coordinator, YMSCO \_\_\_\_\_

**GEOLOGIC MAPPING OF THE RAMPS, MTL DRIFTS, AND ALCOVES**

**ATTACHMENT 3**

**POINTS OF CONTACT**

1 Page

FOC Visitor Control	L. Camp	5-5915
PE/JPC	R. Oliver	4-7095
JPRC	A. Mitchell	4-7156
ESF TCO FTR	R. Kovach	5-6180
ESF TCO Manager	N. Elkins	4-7097
Construction Manager	M. Renegar	5-3699
ESF Designer (Title II)	J. Pye	4-5330
ESF Designer (Title III)	A. Watkins	5-4068
Photo Coordinator	D. Unglesbee	5-5921
T&MSS/SMF Contact	M. Mapa	5-4258
REECO Construction Dept. Manager	T. Leonard	5-5983
REECO Construction Superintendent	D. Hembree	5-5903
RSN Survey Engineer	L. Watson	5-5804
USGS/USBR PI	S. Beason	(303) 236-4177
USGS Field Testing Coordinator	D. Soeder	5-5996
USGS Testing Coordinator	D. Edwards	4-7088
USGS/USBR Regional Geologist	B. Augustine	5-5353
YMP-AMSP FTC	W. Girdley	5-7927
Kiewit/PB	J. Morris	5-5119

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**ATTACHMENT 4**

**GEOLOGIC MAPPING WORK PLAN SAFETY ANALYSIS**

**2 Pages**

## **GEOLOGIC MAPPING WORK PLAN SAFETY ANALYSIS**

The DOE YMSCO AMESH has assigned underground construction and mining safety to the Constructor (REECo.). The LANL TCO recognizes and endorses this action. The TCO will, as required, coordinate planned scientific activities to comply with the Constructors concerns for safety and perform/direct these scientific activities to proceed after full consultation with the Constructor as to safety status.

### **A. References**

- A.1 DOE Order 5481.1B, Paragraph 4.C.**
- A.2 Preliminary Safety Analysis Report (PSAR)  
YMP 91-37.**
- A.3 Project Training - General Employee Training, General Employee Radiological Training, General Underground Training, and First Aid (Red Cross).**
- A.4 OSHA. Hazard Communication 10 CFR 1910, Latest Rev.**
- A.5 Letter, Berry thru Elkins to Baumeister, "Yucca Mountain Site Characterization Project Laser Safety Requirements," (Paragraph II) TWS-EES-13-LV-10-93-18, Dated October 25, 1993.**
- A.6 Letter, Oliver to Wilson, "Use of Class II Laser Survey Instruments, Exploratory Studies Facility Testing Operations - Job Package 92-20A," TWS-EES-13-LV-04-93-29, Dated April 28, 1993.**

**B. All Field Personnel will be trained as cited in Reference A.3, and will remain current by attending appropriate refresher courses.**

**C. All work described in the WP can and will be accomplished using normal underground construction practices for which no safety analysis is required as cited in Reference A.1 (exclusion).**

**D. All field personnel will be equipped with personal safety gear. This includes but is not limited to; hard hat, safety glasses, hard toed shoes, hearing protection, safety belts and lanyards, and a self-rescuer. Training in their use will be per Reference A.3 and the safety standards of the appropriate participants.**

**E. Two participants, USGS/USBR and RSN will use Class II Survey Lasers. Both lasers have been approved under earlier activities, Reference A.5 and A.6.**

**F. Safe operations as described in this Work Plan Safety Analysis will be done from, on, and behind the TBM. When the mapping gantry is delivered and installed, a task specific safety analysis will be submitted/reviewed that will outline both safety and training requirements.**

**F.1 Every attempt will be made to do geologic mapping during TBM maintenance periods (non-operating time).**

**F.2 Work done for geologic mapping before arrival of the mapping gantry will be done by the "Buddy" system (i.e., a work team of at least two).**

**F.3 Installers must belt off before extending/reaching beyond TBM handrails when installing reference targets on tunnel walls from the cat walks of the TBM.**

**F.4 The use of ladders grounded on the TBM to extend reach will not be permitted, whether the TBM is in operating mode or not. Such work will be done behind the TBM trailing gear, after placing appropriate warning signs and stationing a "buddy" to provide warning of approaching muck cars/locis or other mobile equipment.**

**F.5 If unusual conditions occur, consult with TCO Safety Coordinator and REECO/PK.PB safety personnel for possible resolutions.**

**G. The basis for the field activity covered by this safety analysis is the administrative work plan WP 92-20A.**