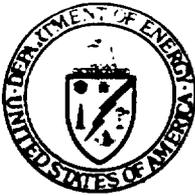


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# Department of Energy

Nevada Operations Office  
P. O. Box 98518  
Las Vegas, NV 89193-8518

WBS # 1.2.3.5  
"QA:N/A"

AUG 11 1989

Ralph Stein, Systems Integration and Regulations Division, HQ (RW-30) FORS

TRANSMITTAL OF YUCCA MOUNTAIN PROJECT SAMPLE MANAGEMENT FACILITY (SMF)  
PROCEDURES REQUESTED BY NUCLEAR REGULATORY COMMISSION (NRC) STAFF

Reference: Letter, Linehan to Stein, dtd 3/27/89

In response to the referenced letter, enclosed are final copies of all the listed Yucca Mountain Project SMF Administrative Procedures (APs) and Branch Technical Procedures (BTPs) that are related to core handling for transmittal to the NRC. The procedures are:

<u>Procedure</u>	<u>Title</u>	<u>Issue Date</u>
AP-6.2Q	Management and Operation of Sample Handling Activities at Borehole Sites, Rev. 0	6/21/89
AP-6.3Q	Interaction of Participants and Outside Interests with Yucca Mountain Project Sample Management, Rev. 0	6/21/89
AP-6.4Q	Procedure for the Submittal, Review, and Approval of Requests for Yucca Mountain Project Geologic Specimens, Rev. 0	7/28/89
AP-6.6Q	Field Collection, Documentation, and Specimen Removal of Exploratory Shaft and Drift Rock, Rev. 0	6/21/89
BTP-SMF-001	Sample Management for the Yucca Mountain Project Office, Rev. 0	7/7/89
BTP-SMF-002	Transport, Receipt, and Admittance for Curation to the Sample Management Facility of Borehole Samples, Rev. 0	7/7/89
BTP-SMF-003	Verification of Field Logging and Documentation of Core and Cuttings, Rev 0	7/7/89
BTP-SMF-004	Physical Processing and Storage of Core and Cuttings at the Sample Management Facility, Rev. 0	7/7/89

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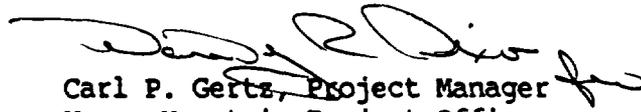
Ralph Stein

-2-

AUG 11 1989

BTP-SMF-005	Examination of Samples by Participants at the Sample Management Facility, Rev. 0	7/7/89
BTP-SMF-006	Removal of Whole Core and Other Specimens from Samples by the Sample Management Facility for Shipment and Remnant Return, Rev. 0	7/7/89
BTP-SMF-007	Acceptance for Curation by the Sample Management Facility of Selected Samples and Documentation, Rev. 0	7/7/89
BTP-SMF-008	Field Logging, Handling, and Documenting Borehole Samples, Rev. 0	7/14/89

If you have any questions concerning these procedures, please contact Uel S. Clanton of my staff at (702) 794-7943 or FTS 544-7943.

  
Carl P. Gertz, Project Manager  
Yucca Mountain Project Office

YMP:USC-5268

Enclosures:

1. Administrative Procedures
2. Branch Technical Procedures

cc w/encls:

N. K. Stablein, NRC, Washington, D.C.   
P. T. Prestholt, NRC, Las Vegas, NV

cc w/o encls:

K. J. Turner, HQ (GAO) FORS  
R. R. Loux, State of Nevada  
Mike Baughman, Lincoln County, NV  
S. T. Bradhurst, Nye County, NV  
Dennis Bechtel, Clark County, NV  
E. L. Spangler, SAIC, Las Vegas, NV, 517/T-38  
A. L. Temple, SAIC, Las Vegas, NV, 517/T-38

**YUCCA MOUNTAIN PROJECT OFFICE  
BRANCH TECHNICAL PROCEDURE**

N-QA-048  
11/88

Title **TRANSPORT, RECEIPT, AND ADMITTANCE  
FOR CURATION TO THE SAMPLE MANAGEMENT  
FACILITY OF BOREHOLE SAMPLES**

No. **BTP-SMF-002** Rev. **0**  
Effective Date **7/7/89**  
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**1.0 PURPOSE AND SCOPE**

This procedure describes the Yucca Mountain Project Office (Project Office) requirements and responsibilities for the transport of Yucca Mountain Project (Project) borehole samples from the field collection site to the Sample Management Facility (SMF), receipt from transport personnel, and admittance for curation.

**2.0 APPLICABILITY**

This procedure applies to the Sample Management (SM) staff and support personnel who perform activities related to transport, receipt, and admittance for curation of Project borehole samples from the field site to the SMF, including core, cuttings, fluids, and other geologic samples.

**3.0 DEFINITIONS**

**3.1 Sample Management**

SM of the Technical and Management Support Services (T&MSS) contractor is the organization responsible for the documentation, storage, and control of selected samples and sample remnants collected and dispersed for analysis and evaluation by participants. SM includes the SMF and Field Operations (FO). SM staff consists of management and operations personnel who ensure that SM operations and documentation satisfy applicable regulatory requirements.

**3.2 Sample Management Facility**

The SMF is the facility used for the documentation, storage, and control of samples and sample remnants collected and dispersed for analysis and evaluation by users. The SMF consists of a physical facility and equipment designed to effectively process and preserve collected samples. The SMF is operated by T&MSS contractor personnel for the Project.

**3.3 Sample**

A sample is part of a population whose properties are studied to gain information about the whole or group. Examples of samples covered by this procedure may include core, cuttings, fluids, and other geologic samples collected at Project borehole sites.

APPROVED BY

Assistant Project Manager	Date	YMP Branch Chief	Date	YMP Project Quality Manager	Date
<i>John E. Shaler</i>	<i>6/28/89</i>	<i>D. E. Livingston</i> <i>Mr. M. B. Blanchard</i>	<i>6/28/89</i>	<i>[Signature]</i>	<i>6/28/89</i>

**UNCONTROLLED**

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**YUCCA MOUNTAIN PROJECT OFFICE  
BRANCH TECHNICAL PROCEDURE**

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11/88**

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### 3.4 Core

A core is a cylindrical section of rock, or fragment thereof, taken as a sample of the interval penetrated by a core bit and brought to the surface for examination and/or analysis.

### 3.5 Cuttings

Cuttings are chips of rock produced during drilling that are removed from the borehole by circulation of drilling fluids (gas, foam, or liquid).

### 3.6 Curatorial Sample Inventory and Tracking System (CSITS)

The CSITS is a computer-based system designed to aid in the control and documentation of Project samples.

## 4.0 RESPONSIBILITIES

### 4.1 Field Operations Geologist

The FO Geologist shall supervise the activities applicable to the shipment of samples from the field collection site to the SMF and shall record information applicable to those shipments.

### 4.2 Sample Management Facility Geotechnician

The SMF Geotechnician shall inspect and accept custody of samples, sample containers, and associated field documentation for admittance for curation upon their arrival at the SMF.

### 4.3 Field Operations Administrative Assistant

The FO Administrative Assistant shall ensure that quality assurance (QA) records resulting from the implementation of this procedure are turned over to the T&MSS Local Records Center (LRC).

### 4.4 Reynolds Electrical & Engineering Company, Inc. (REECo)

REECo staff shall place samples in temporary storage if applicable, load the samples onto the transport vehicle, and operate all preparation and loading equipment, including banders and fork lifts.

### 4.5 Technical Staff Assistant (TS)

The TS Assistant shall sign applicable QA records attesting that the SMF records are correctly completed and conform to QA guidelines.

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**5.0 PROCEDURES**

**5.1 Introduction**

Borehole samples collected and subsequently stored at Project field sites will be transferred to the SMF for processing and storage. This procedure describes the methods necessary to ensure that samples are correctly packaged and shipped from Project borehole sites such that the samples, containers, and associated documentation arrive at the SMF in acceptable condition. However, clerical and handling errors and discrepancies may occur in the field and during transport preparation, including unsuitable packaging of samples, improper or missing documentation or improper annotation of samples or containers. This procedure is designed to minimize the occurrence of these discrepancies and errors and to recognize and correct these errors before they become part of the permanent record.

**5.2 Preparation of Samples and Documentation for Transmittal**

**5.2.1** All activities associated with transmittal of borehole samples and documentation from the drill site to the SMF will be recorded on the Field Container Summary and Transmittal Form ([transmittal form] Figure 1). Transmittal of borehole samples and documents from the site to the SMF will be performed at least once every 24 hours during borehole sample recovery periods. Any deviation from this schedule shall be approved by the FO Manager. All completed, original records will be photocopied on paper marked "COPY" prior to transmittal. The photocopy will be retained at the borehole site, and the original shall be transferred to the SMF. The transmittal form contains a header and information rows. The header includes:

**SHP Bar Code Label** - A shipment (SHP) bar code label will be affixed to the transmittal form. If the transmittal form consists of two or more pages, the shipment bar code label will be affixed to the first page, and the SHP bar code number will be written on the remaining pages.

**Sample Custody Changes** - Signatures, dates, and times of sample transfer from the field site to the transport and from the transport to the SMF will be entered here. At the field site, the FO Geologist will release custody and REECo staff will receive custody; at the SMF, REECo staff will release custody and SMF staff will accept custody.

**Checked By** - The TS Assistant shall sign here and enter the date and time after determining that the information on the transmittal form is completely and accurately entered.

**Borehole identification (ID)** - This is the unique alphanumeric designation assigned to each borehole.

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Pagination - The sequential number for each page will be placed in the first blank. The total number of pages for the entire borehole entry will be placed in the second blank after the borehole has been completely logged.

Shipment Container Total - This is the total number of containers being transported.

Field Forms - Checks will be used by the FO staff to indicate that original, applicable field forms necessary for confirmation verification were shipped, and SMF staff will similarly indicate that the forms were received.

The information rows include:

Sample Type - The type of sample is designated here; e.g., core, cuttings, water, etc.

FCT Bar Code Number - The field container (FCT) bar code number is copied from the bar code on the container label.

Rec'd - Upon receipt of the shipment at the SMF, SMF staff will indicate receipt of each individual container here.

Status Code - Status codes are:

NAT: Not Attempted - If the sample type in the container is core, this would represent cuttings as they would occur during spot coring.

REC: Recovered.

UNREC: Unrecovered - This represents an interval of samples that was drilled but never recovered from the borehole.

WCR: Whole core removed - Section 5.3.3 describes the steps associated with this activity.

LOST: Lost - This is sample that was recovered but was subsequently lost.

DEST: Destroyed - Though this refers primarily to the condition of specimens following laboratory analysis, it is possible that catastrophic events at the drill site might destroy samples.

CONS: Consumed - This is a code almost exclusively reserved for specimens.

Container or Sample Interval - The container interval will be entered here in the same row as the FCT bar code number.

5.2.2 Dunnage will consist of 4 in thick (minimum) foam rubber pads to protect the borehole samples from mechanical shock sustained during transport. A foam rubber pad will be laid on the floor against the front wall of the transport vehicle and the first row of containers laid on top of the pad. Another pad will be placed on top of this row and the second row of containers will be stacked on the second pad. Containers will be stacked a maximum of two rows high. The next two rows will be stacked in the same manner and immediately adjacent to the first two rows.

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5.2.3 Subsequent rows will be stacked immediately adjacent to the first two rows as described above; this will continue until all containers have been loaded or maximum vehicle capacity has been reached. If the load does not completely fill the length of the vehicle, a backing board will be secured against the load to create an integral package. In addition, tie-downs or other methods will be used to prevent upward displacement of containers during transport.

5.2.4 When an entire load has been placed on the vehicle and the total number of containers and the intervals of the samples within those containers have been agreed upon by the FO staff, the REECo staff, and the Teamster, the transmittal form will be signed and dated in the "Field Site to Transport" section by the responsible personnel. The FO Geologist shall then check on the transmittal form to indicate that the applicable field forms are being sent with the shipment. A bar code label representing the entire shipment will be placed on the transmittal form, as described in Section 5.2.1. If data communications are available at the drill site, information from the transmittal form may be entered into CSITS; otherwise, this will be done after arrival of the shipment at the SMF and prior to verification (Project Office Branch Technical Procedure [BTP] BTP-SMF-003).

### 5.3 Transport

All applicable Nevada Test Site transport restrictions described in the REECo Safety Manual shall be observed by transport personnel. Transport personnel shall be aware of emergency procedures.

### 5.4 Receipt of Samples and Documentation

5.4.1 Upon arrival at the SMF, the SMF Geotechnician shall check that field documents completed during field logging as described in BTP-SMF-008 and applicable to that shipment are present and will record receipt of the field documents on the transmittal form. The documents are the Field Photographic Log, the Structural Log, the Lithologic Log, and other applicable forms.

5.4.2 REECo staff will unload the vehicle and place the containers in an available receiving area at the SMF. As the containers are unloaded from the vehicle, the SMF Geotechnician will check that the sample type and FCT bar code numbers correspond to the transmittal form. If the information is correct, a check (✓) is placed in the column next to the FCT bar code number.

5.4.3 After all the containers have been unloaded, and if the total number of containers agrees with that on the transmittal form, the "Transport to SMF" section shall be signed. REECo staff shall sign the "Person Releasing Custody" and the SMF Geotechnician shall sign the "Person Accepting Custody." If the number of containers does not agree with that on the transmittal form, all persons signing custody release blocks shall be contacted and the problem resolved. The containers will then be stacked sequentially on pallets or placed directly on tables in the working area in preparation for admittance for curation.

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### 5.5 Admittance of Samples for Curation

5.5.1 The process followed for the admittance of samples for curation includes the review of field handling, loading, and transport documentation in order to verify that all records are complete and traceability has been maintained. Container labeling, photography, packaging, orientation, reconstruction of the core, depth notation, and marker notation will be checked.

5.5.2 After a sample shipment has been transferred to the SMF, information from the transmittal form will be entered into CSITS if it has not already been done in the field. The Borehole Sample Confirmation Checklist ([checklist] Figure 2) will be generated from this information. The checklist header contains the batch name and ID, the Project and SMF borehole IDs, and the sample type. The lower section of the checklist contains information from CSITS and spaces to check that information.

### 5.6 Confirmation Procedure

Sample containers will be placed in sequential order on the examination table with the container lids propped up behind the container bottoms. Using the checklist, the SMF Geotechnician will begin the sample admittance procedures for each box. If the information is correct, a check (✓) is entered in the appropriate columns, as described:

**Container** - Depth notations on the core or on the cuttings bags will be scrutinized to ensure that they are marked and sequential and that no depths have been skipped or miswritten (e.g., 109-110-112-113-141-115, etc.). Core will be measured with a steel tape to the nearest 0.1 ft; any differences greater than 0.1 ft will constitute a discrepancy. The FCT bar code numbers (specifier) and the uppermost and lowermost depths on the core or on the cuttings bags will be compared to the information from the checklist and to all container labeling locations.

**Labeling** - If the depth notations on the samples correspond to those on the checklist and if that information matches all the labels, checks will be placed in the appropriate columns.

**Orientation (core only)** - The general reconstruction of core and the alignment of the orientation stripes will be checked. If the reconstruction of a break is incorrect, the core will be rotated to fit properly. The orientation stripes will then be misaligned for a section of core. To correct this misalignment, the remaining core will be rotated from the reoriented section to the nearest nonorientation symbol (\*, ø), and the orientation stripes will be annotated. These new orientation stripes will be spaced differently to differentiate them from the original field markings.

**Packaging** - Determine if polystyrene foam cradles, cardboard liners, cardboard dividers, or other appropriate packaging materials are in place.

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**Photograph** (core only) - The instant print will be removed from the document cache affixed to the inside of the container lid (BTP-SMF-008) and compared to the interval of core in the container. The condition of the core should correspond to that in the photograph.

**Sample** - Determine if intervals of core or cuttings Not Attempted (NAT), Unrecovered (UNREC), or Whole Core Removed (WCR) are indicated on a marker placed appropriately in the container. Check that the SPC bar code number for the marker matches the SPC bar code number on the Whole Core Specimen Field Removal Checklist and Contract (BTP-SMF-008). Check that these status codes and their intervals match the information written on all container labels.

**Completed** - The SMF Geotechnician will initial and date admittance of the container after performing all the above steps.

#### 5.7 Resolution of Discrepancies

5.7.1 If a discrepancy in depth notation is discovered during completion of the checklist, the correct depth notations will be marked on the core with a green temporary marker, continuing as far downhole as necessary to correct the problem. If the error is such that the problem may be compounded downhole on undrilled core or cuttings, appropriate field personnel will immediately be notified. It may be necessary to follow the core or bags through several containers to entirely resolve a discrepancy. This change, and changes due to discrepancies in box labeling, will be made on all labels by marking through the incorrect interval with a single line, substituting the correct interval, and initialing this action. The core boxes will then indicate a different interval than on the original Borehole Sample Confirmation Checklist. The newly corrected box intervals will be entered into CSITS, and the information will be used to generate an updated Borehole Sample Confirmation Checklist. The modified entries will be checked, and this process will continue until all discrepancies are resolved.

5.7.2 If a discrepancy other than incorrect depth notation is identified subsequent to the completion of the checklist, the incorrect information shall be crossed through, corrected on the original document, and initialed and dated by the individual making the correction. If the correction is not self-explanatory, the individual shall assign a number to the correction and attach a sheet to the original that fully describes the correction.

#### 5.8 Temporary Storage

The containers will then be placed on pallets in the SMF until verification of field logging and documentation (Project Office Branch Technical Procedure BTP-SMF-003) commences.

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### **5.9 Nonconformance Reporting**

A nonconformance exists when there is a deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate. The intent of nonconformance reporting is to assure the resolution of the conditions not meeting the requirements or to assure that undefined conditions are defined. If there are any nonconformances to this procedure noted during or after associated activities, SMF staff shall report them to the Project Quality Manager or another individual in the Project Office QA organization. Segregation of a nonconforming item or termination of a nonconforming activity will be done according to Quality Management Procedure (QMP) QMP-15-01.

### **6.0 REFERENCES**

BTP-SMF-003, Verification of Field Logging and Documentation of Core and Cuttings.

BTP-SMF-008, Field Logging, Handling, and Documenting Borehole Samples.

QMP-15-01, Rev. 1, Control of Nonconformances.

REECo Safety Manual.

### **7.0 FIGURES**

Figure 1- Field Container Summary and Transmittal Form.

Figure 2- Example of CSITS-generated Borehole Sample Confirmation Checklist.

### **8.0 QA RECORDS**

The FO Administrative Assistant shall ensure that the following QA records resulting from implementation of this procedure are turned over to the T&MSS LRC at least every 10 business days. Copies of the QA records will be retained by the SMF and stored at the SMF Documents Center.

- 1. Field Container Summary and Transmittal Form.**
- 2. Borehole Sample Confirmation Checklist.**



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**BOREHOLE SAMPLE CONFIRMATION CHECKLIST**

Batch: WOFAT : BAT10019                      Borehole: YMP-AC-1 : BHL10005                      Sample Type: CORE

Container Specifier	Container		Labeling		Orient.	Pkg.	Photo	Sample			
	Top	Bottom	Lid	Body				Top	Bot	Status	SMF Geotech.
200	0.0	105.2	<input checked="" type="checkbox"/>	0.0	100.0	NAT	<input checked="" type="checkbox"/>				
			100.0	105.2				REC	<input checked="" type="checkbox"/>		
201	105.2	110.8	<input checked="" type="checkbox"/>	105.2	109.8	REC	<input checked="" type="checkbox"/>				
			109.8	110.0				UNREC	<input checked="" type="checkbox"/>		
			110.0	110.8				REC	<input checked="" type="checkbox"/>		
202	110.8	116.3	<input checked="" type="checkbox"/>	110.8	111.3	REC	<input checked="" type="checkbox"/>				
			111.3	111.7				WCR	<input checked="" type="checkbox"/>		
			111.7	116.3				REC	<input checked="" type="checkbox"/>		
203	116.3	120.0	<input checked="" type="checkbox"/>	116.3	119.7	REC	<input checked="" type="checkbox"/>				
			119.7	120.0				UNREC	<input checked="" type="checkbox"/>		

SMF Geotechnician: *Sergio Donaldson* Date: 6/20/89                      TS Assistant *Chris Lewis* Date: 6/20/89

Figure 2. Example of CSITS-generated Borehole Sample Confirmation Checklist.

# YUCCA MOUNTAIN PROJECT ADMINISTRATIVE PROCEDURE

N-AD-001  
10/88

**Title** AP-6.6Q FIELD COLLECTION, DOCUMENTATION, AND SPECIMEN REMOVAL  
OF EXPLORATORY SHAFT AND DRIFT ROCK

## 1.0 PURPOSE AND SCOPE

This procedure describes the Yucca Mountain Project Office (Project Office) requirements and responsibilities for the collection, documentation, and specimen removal and distribution of bulk mined samples from the Yucca Mountain Project (Project) exploratory shafts and drifts during sinking and mining activities.

## 2.0 APPLICABILITY

This procedure applies to all bulk samples collected during excavation of the shafts and drifts of the Project Exploratory Shaft Facility (ESF). It does not include core or sidewall samples collected directly from the shafts, drift walls, or breakout rooms.

## 3.0 DEFINITIONS

### 3.1 SAMPLE MANAGEMENT (SM)

SM of the Technical and Management Support Services (T&MSS) contractor is the organization responsible for the collection, documentation, storage, and control of selected samples and sample remnants collected and dispersed for analysis and evaluation by participants. SM includes Field Operations (FO) and the Sample Management Facility (SMF). SM staff consists of management and operations personnel who ensure that SM operations and documentation satisfy applicable regulatory and quality requirements.

### 3.2 SAMPLE MANAGEMENT FACILITY

The SMF is the facility used for the documentation, storage, and control of samples and sample remnants collected and dispersed for analysis and evaluation by Users. The SMF consists of a physical facility and equipment designed to effectively process and preserve collected samples.

### 3.3. SAMPLE OVERVIEW COMMITTEE (SOC)

The SOC is comprised of representatives from Lawrence Livermore National Laboratory, Los Alamos National Laboratory, Sandia National Laboratories, the U.S. Geological Survey, SM, T&MSS, and the Project Office. It was formed to ensure a balance between Project sample needs, acquisition, and use, and the need to curate samples for posterity.

UNCONTROLLED

**APPROVALS**

Effective Date <b>6/21/89</b>	Revision <b>0</b>	Project Manager <i>[Signature]</i> 6/1/89	Page <b>1 of 10</b>	No. <b>AP-6.6Q</b>
	Supersedes	QA Manager <i>[Signature]</i> 6/3/89		

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Title AP-6.6Q FIELD COLLECTION, DOCUMENTATION, AND SPECIMEN REMOVAL  
OF EXPLORATORY SHAFT AND DRIFT ROCK

3.4 EXPLORATORY-SHAFT (ES)

The two ESs are each 12-ft in diameter shafts and vertically mined to the approximate depth of the repository horizon. They provide access to the repository horizon for scientific investigations. Construction of the ESs shall be in accordance with Project Administrative Procedure (AP) AP-5.10Q.

3.5 EXPLORATORY SHAFT FACILITY

The ESF includes the surface facilities, shafts, and subsurface excavations directed by the Project to allow detailed study of the host rock under in situ conditions.

3.6 DRIFT

A drift is a horizontally mined excavation in the ESF. A series of drifts will be mined in the ESF.

3.7 DRIFT INTERVAL

A drift interval is a cross-sectional area of a drift from which samples will be routinely collected.

3.8 BREAKOUT ROOM

A breakout room is a lateral opening mined from an ESF shaft from which selected tests will be performed.

3.9 BREAKOUT HORIZON

A breakout horizon is an area or zone from which a lateral drift or station is mined away from the shaft. It may also be a mine drift, pump station, or other area off a vertical shaft.

3.10 SCIENTIFIC SHAFT (ES-1)

The ES-1 will be mined for the purpose of satisfying the scientific needs of the Project site characterization effort.

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**Title** AP-6.6Q FIELD COLLECTION, DOCUMENTATION, AND SPECIMEN REMOVAL  
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3.11 FAST SHAFT (ES-2)

The ES-21 will be mined primarily for safety egress, ventilation, and various operational functions, but will also be used for some scientific investigations.

3.12 MUCK

Muck is broken rock that results from excavation during ESF mining operations.

3.13 BULK SAMPLE

A bulk sample is a rock sample of irregular size and shape obtained by excavation. This definition excludes core from drillholes. Bulk samples collected according to this procedure will be representative portions of the muck from each blasting round during excavation of the ESF.

3.14 CURATORIAL SAMPLE INVENTORY AND TRACKING SYSTEM (CSITS)

The CSITS is a computer-based system designed to aid in the control and documentation of Project samples.

4.0 RESPONSIBILITIES

4.1 SAMPLE MANAGEMENT

SM staff shall direct the collection of muck at the headframe, provide sample collection documentation forms, mark and record sample information to ensure traceability, transport samples to the SMF, provide support facilities for specimen storage and distribution, and archive material from each round.

4.2 PROJECT OFFICE SITE REPRESENTATIVE

The Project Office Site Representative or other Project Office Division level personnel shall comply with requirements in Project Office Quality Management Procedure (QMP) QMP-01-02, Stop Work, should conflicts arise during collection of samples at Project sample collection sites.

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**4.3 PRINCIPAL INVESTIGATOR (PI)**

The PI from the responsible Project participant is responsible for designing and directing all testing in the ESF and for directing the SM staff to ensure that samples collected meet requirements.

**4.4 SAMPLE OVERVIEW COMMITTEE**

Prior to excavation of the shafts, the SOC shall review requests from PIs for muck samples and make recommendations to the Director of the Regulatory and Site Evaluation Division (RSED) according to AP-6.4Q. The RSED Director shall approve or disapprove the requests, and the SOC shall notify participants of Project Office authorization.

**4.5 ESF TEST MANAGER**

The ESF Test Manager will notify PIs who have requested information concerning any unusual or unexpected features encountered during excavation and mapping of the shafts and drifts.

**4.6 MINER**

The miner shall assist with collection activities by operating equipment, loading muck buckets at the shaft bottom, and assisting with other activities required by the ESF Test Manager or SM staff. Miners will notify the ESF Test Manager or designee of any unusual or unexpected geologic conditions during excavation.

**5.0 PROCEDURE**

**5.1 INTRODUCTION**

5.1.1 To obtain representative samples from the ESF, it is important that this procedure be implemented to (1) provide opportunities for all interested parties to obtain samples from the complete geologic section; (2) obtain samples from the vertical section rubblized by each round; (3) obtain well-documented, traceable samples; (4) perform activities in a safe manner; and (5) allow minimal disruption to the regular mining activity. Any deviation from this procedure or from the Drilling Program Package requires prior consultation and agreement between FO personnel and the FO Manager and is subject to the requirements of Section 6 in the Project Quality Assurance Plan (QAP), NNWSI/88-9, Rev. 2. The size of each shaft limits sample

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collection at the bottom of the shaft. It is therefore necessary to obtain bulk samples at the headframe and not at the bottom after each shot.

5.1.2 The ESF Test Manager will notify PIs who have requested information concerning any unusual or unexpected features encountered during excavation and mapping of ESF. Miners will also notify the ESF Test Manager of any unusual features. If it is necessary to collect additional samples when these features are encountered, the ESF Test Manager shall direct SM staff in these instances.

### 5.2 SHAFT SAMPLE COLLECTION

5.2.1 A muck haul truck of sufficient quantity (minimum 10 ton) will be used for collecting and transporting samples from ES-1 and ES-2. Three buckets of muck (approximately two tons each) will be collected as samples during each muck cycle.

5.2.2 After the round is shot and the shaft is readied for mucking, the first shaft sinking bucket will be loaded 3/4 full from the top 4 ft of muck. This first load will be mostly larger pieces. As this first bucket is hoisted to the surface, the miner assisting the cryderman operator at the bottom will signal above this bucket is for sampling. Before the bucket is dumped in the main dump chute, a suitable container (such as a muck truck designated for sample transport) will be positioned under the dump chute and will catch this first bucket or rock. Mucking can then continue until the 4 ft of muck is exposed. At this point a 1/2 - 3/4 bucketful will be loaded, hoisted to the surface, and dumped into the truck. Mucking can then continue until the last 4 ft of the blasting round is exposed. At this time another 1/2 - 3/4 bucketful will be dumped into the truck. The truck will then be driven to Area 25 where it will be emptied into a clean, covered, concrete bin located in a secured area at the SMF.

### 5.3 DRIFT AND BREAKOUT ROOM SAMPLE COLLECTION

Samples will also be collected from the drifts and breakout rooms that are mined as part of the ESF. SM staff will attempt to sample the muck to represent the lateral distance excavated by the blast. One 55 gal barrel per round will be loaded with muck, transported from the drift by a loader, and carried to the surface on the mancache. It will then be transported to the SMF.

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5.4 UNUSUAL SAMPLING REQUIREMENTS

5.4.1 For those predetermined blasting rounds from which dry samples have been requested, samples will be collected prior to water misting or wet-down. The sample will come from the first bucket load and must be kept dry and uncontaminated. The sample will be dumped in an area close to the headframe, leveled to a depth of about 2 ft, and marked with an identifier indicating round and depth in the shaft. The area shall be covered for sorting and sealing. SM staff, the PI, or designated representative will select pieces to be sealed and labeled, transported in a refrigerated truck to the SMF, and placed in a cooler. SM staff shall honor any special handling and/or packaging needs, as specified by the PI and directed by the ESF Test Manager.

5.4.2 Another modification of this procedure may occur when a PI requires collection of all the muck generated from a specified round. It is anticipated that such requests will be limited in number (approximately five) and will be made only for intervals below the breakout horizon. In those cases, the muck will be removed from the shaft according to normal mining procedures and removed to the access-controlled yard at the SMF. It will be leveled to a depth of about 2 ft and marked with an identifier indicating round and depth in the shaft. The PI shall be responsible for providing transportation of the muck to the SMF and for removing the muck when no longer needed. SM shall provide the necessary documentation to record the transfer to and from the SMF.

5.4.3 Access to the muck from some drift intervals (for instance, those intervals actually crossing fault zones) may be requested by PIs. In this case, muck from those intervals will be specifically collected by SM staff as directed by the ESF Test Manager and made available to the PI.

5.5 TRANSFER OF SAMPLES FROM THE ESF TO THE SMF

The transfer of the samples to the SMF will be documented on the Sample Collection Report (Exhibit 1). SM staff will issue a unique designator in the form of a machine scannable bar code label affixed to the report and to the truck load. The staff delivering the sample load will present the Sample Collection Report to SMF staff upon placing the load into a bin. If all required information is present on the Sample Collection Report, the staff delivering the sample load and the SMF staff member completing the custody change will sign and date the Sample Collection Report. Information from the Sample Collection Report will be entered into CSITS. Information

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from CSITS will be used to generate shaft sample bin labels for the sample load and will contain the sample identification bar code, storage bin location, collection location, date of collection, date of receipt at the SMF, and date placed in storage. These labels will be affixed to label holders on the sample bin.

#### 5.6 SAMPLE EXAMINATION

After the samples are placed in the bin, PIs or their designated representatives can examine and select the samples they require from the collected material. Samples will generally be available at the SMF for examination for approximately seven days; however, availability may be determined by the excavation rate in the ESF. Procedures describing the process required to gain authorization to examine samples are found in Project Administrative Procedure (AP) AP-6.3Q.

#### 5.7 SAMPLE DISTRIBUTION

5.7.1 The removal of bulk specimens shall be authorized by the RSED Director who may at his discretion call upon the SOC for recommendations for or against specimen removal. The RSED Director shall normally grant a blanket authorization to a PI for examination and specimen removal for shaft and drift specimens. This allows the PI access to all muck materials while they are laid out for examination and specimen selection. SMF staff will then distribute samples to PIs as described in AP-6.3Q. When PIs or their representatives collect the samples from the muck, SM will provide documentation and packing materials.

5.7.2 After all interested parties have selected the samples they require, two 55 gal barrels of archival material will be taken from the truck load for storage at the SMF. These barrels will be documented, labeled, sealed, and then stored in a designated barrel storage area. If archival samples of hydrochemical muck samples are required, they will be sealed and refrigerated. Authorization to secure samples from the archive barrels shall be secured from the RSED Director.

#### 5.8 IDENTIFICATION AND RESOLUTION OF DISCREPANCIES

5.8.1 A discrepancy exists when there is incorrect information that significantly affects documentation or notation that is beyond the scope of the immediate activity or form being completed. Any discrepancies shall be resolved upon discovery.

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5.8.2 If the incorrect information is identified by the originator or other person subsequent to the completion of the document or activity (i.e., becomes a record), the individual is responsible for documenting the corrections to the erroneous information. The incorrect information shall be crossed through, corrected on the original document, and initialed and dated by the individual making the corrections. If the correction is not self-explanatory, the individual shall assign a number to the correction and attach a sheet to the original that fully describes the correction that has been performed.

5.8.3 If a discrepancy is found on a form or document, and the same discrepant information appears on previous documents already verified (entered into a baselined data system), then corrections will be made on a copy of the field record. This corrected copy will be placed with the uncorrected file copy of the record.

**5.9 NONCONFORMANCE REPORTING**

A nonconformance exists when there is a deficiency in characteristic, documentation, or procedure that renders the quality of an item or activity unacceptable or indeterminate. The intent of nonconformance reporting is to assure the resolution of the conditions not meeting the requirements or to assure that undefined conditions are defined. If there are any nonconformances to this procedure noted during or after associated activities, SMF staff members shall report them to the Project Office Project Quality Manager or another individual in the Project Office QA organization. Reporting and segregation of a nonconforming item or termination of a nonconforming activity will be done according to QMP-15-01.

**6.0 REFERENCES**

AP-6.3Q, Interaction of Participants and Outside Interests with Project Office Sample Management.

AP-6.4Q, Approval Procedure for Requests for YMP Geologic Specimens.

QMP-01-02, Stop Work.

QMP-15-01, Control of Nonconformances.

QMP-17-01, Record Source and Record User Responsibilities.

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7.0 APPLICABLE FORMS

Exhibit 1. Sample Collection Report.

8.0 RECORDS

The PI shall ensure that the following quality assurance records resulting from implementation of this procedure are processed according to QMP-17-01 and turned over to the T&MSS Local Records Center at least every 10 working days. Copies of these records will be retained by SM and stored at the SMF Documents Center.

1. Sample Collection Report.

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<b>YUCCA MOUNTAIN PROJECT SAMPLE MANAGEMENT FACILITY</b>			
SAMPLE COLLECTION REPORT		BTPSMF7-1 5/89	
Date Sample Collected			Page ____ of ____
Sample Collector			
Organization			
Collector's Sample ID			
PLACE SMP BAR CODE LABEL HERE			
Type of sample (circle): rock    muck    soil    liquid    gas other (specify): _____			
Type of site    (Circle all appropriate entries)			
SURFACE:		ESF: Shaft    Drift	
trench    outcrop    borehole    other	borehole	muck pile	in place    other
Collection Location:			
SAMPLE: weight _____, volume _____, dimensions _____			
FIELD PHOTOS (circle): prints    slides    instant prints    video    photogrammetry    NA			
STORAGE REQUIREMENTS:			
REMARKS:			
SAMPLE TRANSFER TO SMF (Check one) <input type="checkbox"/> Yes <input type="checkbox"/> No			
Person Releasing Custody	Date	Person Accepting Custody	Date
SMF USE	STORAGE LOCATION: Area _____ Unit _____		
	Date Stored _____		Time Stored _____
	Verified By: _____ Date _____		

Exhibit 1. Sample Collection Report.

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