

YMP-054-R0 YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT OFFICE  
7/12/91 DOCUMENT APPROVAL SHEET

Title STAGING, PACKAGING, AND DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES  
NO. BTP-SMF-013  
[X] Q  
[ ] Non Q

APPROVAL

PROJECT MANAGER: [Signature] 9/19/91  
Signature Date

DIRECTOR OF QUALITY ASSURANCE: [Signature] 9-18-91  
Signature Date

YMP SIB Chief (OTHER, AS REQUIRED): [Signature] 9-19-91  
Signature Date

REVISION 0 EFFECTIVE DATE: 9/20/91

REVISIONS

	INITIAL AND DATE			
	REVISION 1	REVISION 2	REVISION 3	REVISION 4
PROJECT MANAGER:	_____	_____	_____	_____
DIRECTOR, QA:	_____	_____	_____	_____
(OTHER, AS REQUIRED)	_____	_____	_____	_____
EFFECTIVE DATE:	_____	_____	_____	_____



TRAINING REQUIRED  YES  N/A NUMBER OF DAYS REQUIRED FOR TRAINING N/A

COMMENTS:  
**NO PERSONNEL BASELINED TRAINING WILL BE AFFORDED UPON REQUEST.**

[Signature] 9/19/91  
TRAINING OFFICER/TRAINING MANAGER DATE

## 1.0 PURPOSE AND SCOPE

### 1.1 PURPOSE

The purpose of this procedure is to define the requirements and responsibilities for photographing, staging, selecting, packaging, and documenting geologic samples and specimens acquired from Yucca Mountain Site Characterization Project (YMP) neutron-access boreholes.

### 1.2 SCOPE

The scope of this procedure includes (1) initial sample handling at the neutron-access borehole, (2) videotaping of neutron-access borehole core, (3) removing neutron-access borehole specimens, (4) determining depth intervals of core, (5) boxing specimens, (6) handling cuttings, (7) sample and specimen storage, (8) summary reporting, (9) records, and (10) monitoring of site activities.

## 2.0 APPLICABILITY

This procedure applies to those Field Test Control Department (FTCD) Field Operations (FO) staff who photograph, stage, select, package, and document geologic samples and specimens acquired at YMP neutron-access boreholes.

## 3.0 DEFINITIONS

NOTE: Terms in this procedure are used as defined in the Project Glossary. The following additional definitions are adopted for the purposes of this procedure.

### 3.1 CORE

Core consists of 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.

### 3.2 CORE RUN

A core run is an attempt to drill and recover a length of core. It is also the core recovered from the core barrel after the core run.

### 3.3 CUTTINGS

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

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 3 of 23

## 3.4 DAILY ACTIVITIES LOG (DAL)

The DAL is a daily, chronological record of activities (using a 24-hour timeclock [0000-2400 hours]) that occur during drill site operations. It is kept in a paginated, hardbound notebook.

## 3.5 DISCREPANCY

A discrepancy exists when incorrect documentation or notation is discovered after completion of the immediate activity or form.

## 3.6 NEUTRON-ACCESS BOREHOLE

A neutron-access borehole is a borehole drilled under Site Characterization Plan (SCP) Section 8.3.1.2.2.1, Characterization of Unsaturated-Zone Infiltration. These boreholes have a prefix of N- (neutron), LPRS- (large plot rainfall simulation), or SPRS- (small plot rainfall simulation).

## 3.7 RUBBLE

Rubble consists of fragments of core from a single interval, the individual diameters of which average less than one-half the diameter of the whole core. They are broken in such a manner that reconstruction between individual pieces is impossible.

## 3.8 SAMPLE

A sample is part of a population whose properties are studied to gain information about the whole or group. Examples of samples include core, cuttings, and fluids collected at YMP borehole sites.

## 3.9 SAMPLE OVERVIEW COMMITTEE (SOC)

The SOC is comprised of representatives from Los Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories, United States Geological Survey, the Technical and Management Support Services contractor, Yucca Mountain Site Characterization Project Office (YMPO), and Quality Assurance (QA). The SOC was formed to ensure a balance between YMP sample needs, acquisition, and use, and the need to curate samples for posterity.

## 3.10 SPECIMEN

A specimen is a subsection or portion that has been removed from a sample or remnant and tracked individually.

**YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
PROCEDURE**

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 4 of 23

**3.11 UNIQUE IDENTIFIER (ID)**

An ID is a designation that sets a documentable object or event apart from similar entities. It may consist of an assigned number, a name, an alphanumeric designation, or a set of data items that collectively serve to specify the entity. Examples of IDs used in this procedure include borehole ID, container ID, sample ID, or specimen ID.

**4.0 RESPONSIBLE PARTIES**

The following YMP individuals or organizations are responsible for activities described in Section 5.0 of this procedure:

1. FO Staff (FO Staff may consist of the FO Manager, FO Shift Supervisor, FO Lead Geologist, and/or FO Geologist)
2. FO Senior Geologist
3. FO Shift Supervisor

**5.0 PROCEDURE**

NOTE: A flowchart of the following processes described in this procedure is attached as Figure 1. All forms in this procedure shall be filled out as the information becomes available.

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
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**INITIAL SAMPLE HANDLING**

- |          |    |  |
|----------|----|--|
| FO Staff | 1. | Maintain controlled access to logging trailer by maintaining visual contact, locking, or other means, as necessary. Maintain Field Facility Access Log (Attachment 1), according to instructions on back of log. |
|          | 2. | Determine sample type.   |
|          | a. | If cuttings, go to Step 24.  |
|          | b. | If core, continue with next step.  |

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 5 of 23

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
FO Staff	3.	Take custody of inner barrel and core at drill rig. Obtain run number and interval from driller or designee. Mark barrel at uphole end. Cap ends of barrel.
	NOTE:	To preserve moisture content of samples, Steps 4-14 must be performed as quickly as possible. If any of these steps are delayed, the ends of the barrel shall be recapped.
	4.	Transport inner barrel to logging trailer. Extrude barrel if necessary. Open barrel to expose core. Fill out polystyrene foam (foam) Run Marker with run number and interval, and place it at top of core run.
	5.	Fit pieces of core together to reconstruct longer sections of core. Fit rubble zones to represent as nearly as possible their in situ intervals.
	6.	Measure length of core to nearest 0.1 ft (+/- 0.2 ft). Record borehole ID, run number, and amount of recovered core on Specimen Log (Attachment 2).
	7.	Use red and blue permanent markers to place parallel orientation stripes on core, red on right, from top to bottom.

### VIDEOTAPING OF CORE

8. Place scale marked in 0.1-ft intervals and annotated with the borehole ID beside the core. Ensure that:
  - a. Proper cassette is identified and in video camera
  - b. Markers are visible and legible
  - c. Core is well-lighted

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 6 of 23

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
FO Staff		d. Camera is set on "Record" mode e. Track speed is set correctly 9. Videotape the core run with high-resolution video camera. Complete Field Photographic Log (Attachment 3) according to instructions on back of log. 10. Write following information on videotape cassette: borehole ID, run number(s), dates, tape number, and total footage interval documented by the cassette. Lock tape in a cool, dark location until transfer to the Sample Management Facility (SMF).

### REMOVING SPECIMENS

11. Select specimens to be removed according to SOC instructions and approval.
12. Remove specimen. Mark all artificial breaks sustained during handling with parallel heavy black lines on both sides of break. Assign specimen a temporary ID and place borehole ID and temporary specimen ID on packaging material. Record temporary specimen ID on Specimen Log.
13. Measure length of specimen to nearest 0.1 ft (+/- 0.2 ft). Record specimen length on Specimen Log.
14. Package specimen according to specifications of principal investigator (PI).

### DETERMINING DEPTH INTERVALS

15. Determine if length of core recovered equals length of core cut.
  - a. If yes, go to Step 17.
  - b. If no, continue with next step.

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 7 of 23

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
FO Staff	16.	Determine if length of core recovered is greater than length of core cut.  a. If yes, reconcile interval with last unrecovered core interval. Then go to Step 17.  b. If no, place unrecovered core interval at bottom of run.  NOTE: At the discretion of FO Staff, unrecovered core intervals may be placed elsewhere in the run, based on communication with driller, information from rig floor, previous drilling experience in similar rock, etc.
	17.	Determine specimen intervals and unrecovered core interval(s). Complete scale on Specimen Log.
	18.	Place specimen interval on packaging material containing specimen. Record specimen interval on Specimen Log. Record run number, run interval, and amount of core drilled, recovered, and unrecovered on Shift Drilling Summary (Attachment 4), according to instructions on back of summary.
	19.	Complete Field Specimen Removal Checklist and Contract (Specimen Contract; Attachment 5), according to instructions on back of contract. Record permanent specimen ID number on contract, on packaging material containing specimen, and on Specimen Log. Complete Specimen Log Summary, according to instructions on back of log.
	20.	Ship specimen, and copies of Specimen Log and Specimen Contract to PI/designee, release them directly to PI/designee, or temporarily store at field trailer before shipment to SMF.

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 8 of 23

RESPONSIBLE PARTY

STEPS

PROCEDURE

### BOXING SPECIMENS

FO Staff

21. Place similarly packaged specimens into specimen containers.
22. Affix labels listing borehole ID, sample type, container ID, and interval(s) of specimen(s) in container to downhole end of base and lid of container.
23. Seal each container with nylon filament tape.

### CUTTINGS HANDLING

NOTE: Cuttings shall be collected and packaged for (1) curation at the SMF, and (2) PI use, as necessary.

24. Collect and package cuttings according to instructions from SOC and specifications of PI.

NOTE: SOC instructions are included on the SOC Specimen Removal Request. PI specifications are included in or with the Criteria Letter. These documents will be filed at the logging trailer, per QMP-17-01, Records Management: Record Source Implementation.

25. Mark each sample container with borehole ID, date, and depth interval. If a sample was not collected, place a marker (with uncollected sample information) in place of uncollected sample.
26. Prepare cuttings for shipment, according to specifications of PI. Complete Specimen Contract for PI specimens, according to instructions on back of contract.

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 9 of 23

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
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### TEMPORARY STORAGE OF SAMPLES, SPECIMENS, AND FIELD RECORDS

FO Staff	27.	Temporarily store borehole samples, specimens, and records in access-restricted facility, protected from inclement weather.
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### SUMMARY REPORTING

	28.	Maintain DAL. Entries will be legible, concise, in indelible black ink, and initialled. Incoming FO Staff shall read the day's entries and shall be briefed by outgoing FO Staff, as necessary.
FO Senior Geologist	29.	Complete Shift Drilling Summary, according to instructions on back of summary.
FO Shift Supervisor	30.	Report shift activities to the FO Manager.

### RECORDS

NOTE: Records will be stored in the logging trailer, per QMP-17-01.

FO Staff	31.	Duplicate all original field records prior to transmittal to the SMF.
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### MONITORING OF SITE ACTIVITIES

	32.	Identify discrepancies. Cross through discrepancies, correct original document, and initial and date correction. If correction is not self-explanatory, attach sheet to original describing correction made.
	33.	Identify any nonconformances to this procedure and process in accordance with QMP-15-01, Control of Nonconformances.

## 6.0 REFERENCES

NOTE: Refer to the latest version of the documents listed below unless otherwise stated.

### 6.1 REQUIREMENTS DOCUMENTS

Office of Civilian Radioactive Waste Management (OCRWM) Quality Assurance Requirements Document, DOE/RW-0214

OCRWM Quality Assurance Program Description Document, DOE/RW-0215

### 6.2 INTERFACE DOCUMENTS

Project Glossary, YMP/89-15

QMP-15-01, Control of Nonconformances

QMP-17-01, Records Management: Record Source Implementation

## 7.0 FIGURES AND ATTACHMENTS

Figure 1, BTP-SMF-013 Flowchart

Attachment 1, Field Facility Access Log (YMP-013-R0)

Attachment 2, Specimen Log (YMP-065-R0)

Attachment 3, Field Photographic Log (YMP-014-R0)

Attachment 4, Shift Drilling Summary (YMP-012-R0)

Attachment 5, Field Specimen Removal Checklist and Contract (YMP-010-R0)

## 8.0 RECORDS

Records packages of documentation generated as a result of this procedure shall be assembled and submitted to the appropriate Local Records Center in accordance with requirements specified in approved procedures. Quality Assurance (QA) Records shall be those records so designated by the Yucca Mountain Site Characterization Project Office during the processes described in this procedure.

The following QA Records are generated by this procedure:

1. Specimen Log

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 11 of 23

2. Field Photographic Log
3. Shift Drilling Summary
4. Field Specimen Removal Checklist and Contract
5. DAL
6. Core videotape

The following non-QA Records are generated by this procedure:

1. Field Facility Access Log

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 12 of 23

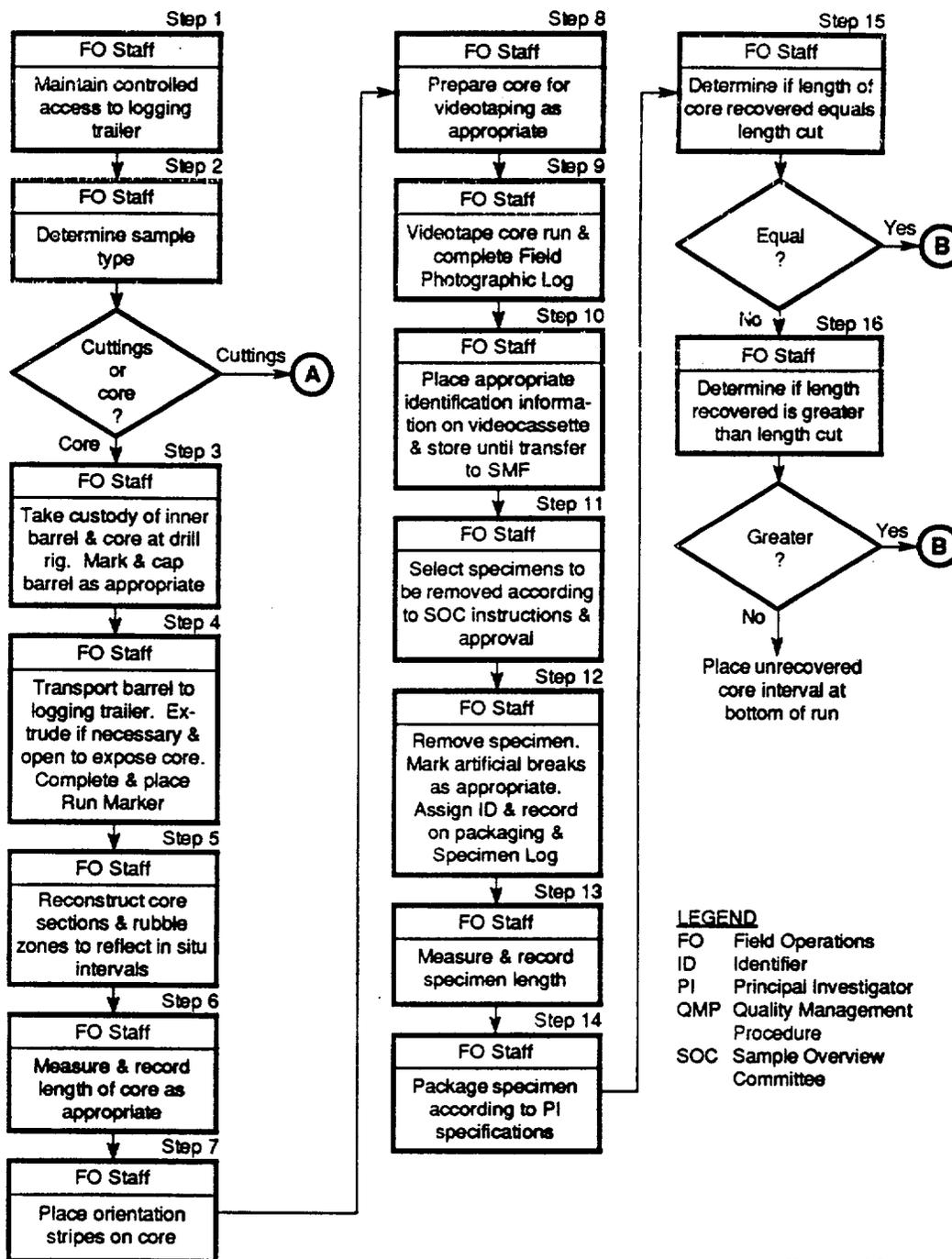


Figure 1. BTP-SMF-013 Flowchart

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES	Revision: 0	Page 13 of 23
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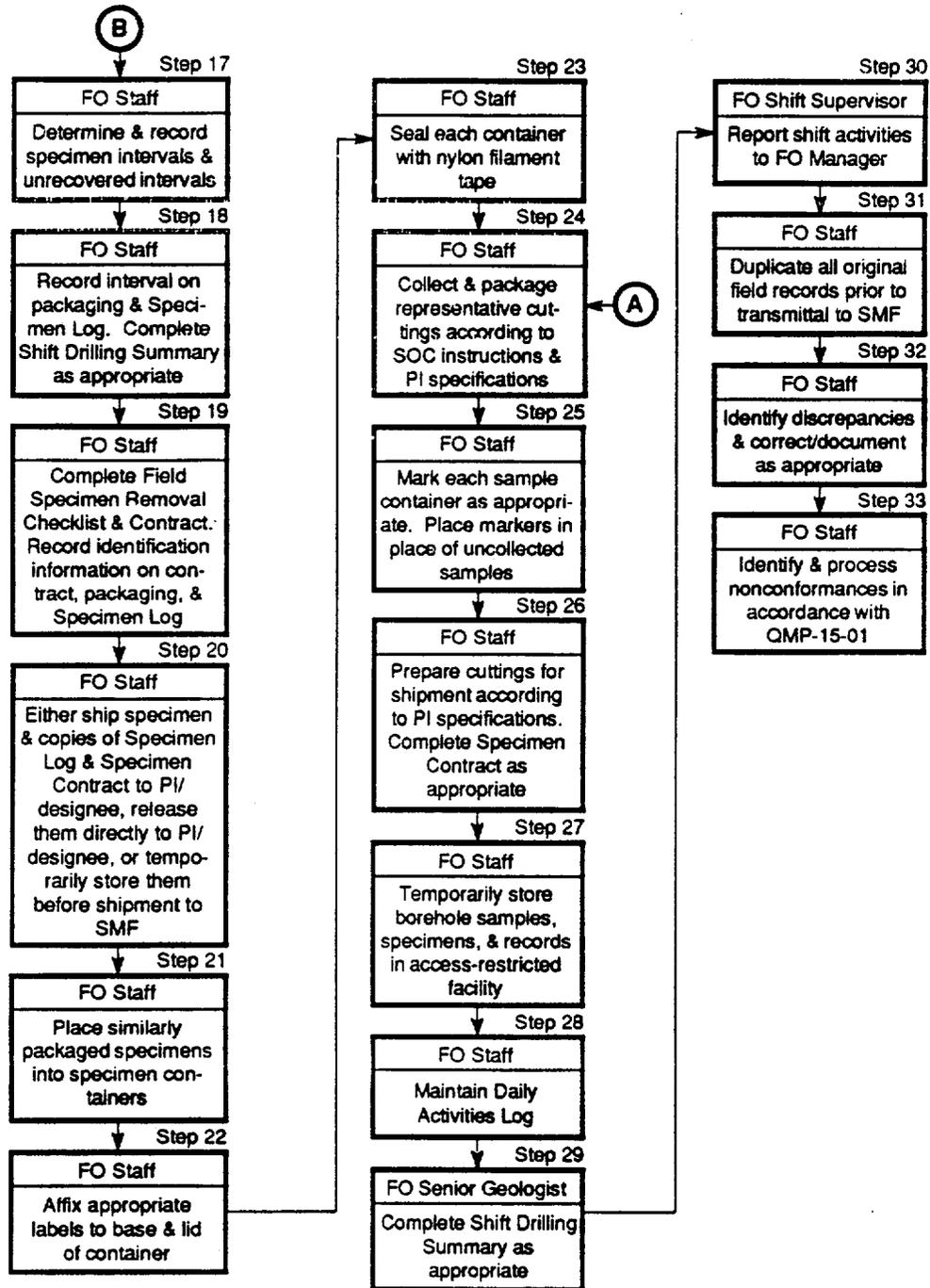


Figure 1. BTP-SMF-013 Flowchart (continued)

YMP-053-R0  
7/12/91

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 14 of 23

YMP-013-R0  
4/19/91  
WBS: \_\_\_\_\_  
QA: \_\_\_\_\_

## YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY FIELD FACILITY ACCESS LOG

Borehole ID # \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_

Shift Start Date \_\_\_\_\_ Shift Time \_\_\_\_\_ (0000 - 2400 clock)

	Name	Organization	Purpose of Visit
Print			
Sign			
Print			
Sign			
Print			
Sign			
Print			
Sign			
Print			
Sign			
Print			
Sign			
Print			
Sign			
Print			
Sign			

BTP-SMF-008

Attachment 1. Field Facility Access Log (YMP-013-R0)

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 15 of 23

## INSTRUCTIONS FOR PREPARATION OF YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY FIELD FACILITY ACCESS LOG YMP-013

### HEADER INFORMATION

Borehole ID # Unique alphanumeric designation assigned to borehole

Pagination Numbers sequentially assigned to sheets; first blank contains number of that particular sheet; second blank contains total number of sheets completed for the shift

Shift Start Date Date shift starts

Shift Time From / to; using a 24-hour timeclock (0000 - 2400 hrs)

### COLUMN INFORMATION

Name Name and signature of individual entering the facility; not applicable to FO Staff

Organization Organization of individual

Purpose of Visit Brief description of purpose of visit

NOTE: Individuals only need to sign in the first time they enter the facility during the shift.



# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 17 of 23

## INSTRUCTIONS FOR PREPARATION OF YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY SPECIMEN LOG YMP-065

Borehole ID	Unique alphanumeric designation assigned to each borehole
Run No.	Core run number
Pagination	Number sequentially assigned to sheets; first blank contains number of that particular sheet; second blank contains total number of sheets for the form
Geologist(s)/Date	Name(s) of geologist(s) completing the form, and date
Checked By/Date	FO Staff not directly responsible for completion of form, and date
Time on Floor	Time (by 2400-hour timeclock, 0000-2400 hrs) the core barrel is laid on rig floor
Time Open	Time (by 2400-hour timeclock, 0000-2400 hrs) the core barrel is opened at the logging trailer
Run Interval/Amount	Depth interval of the run and amount of footage cut during the run, as reported by driller
Amount Recovered Core	Amount of core recovered from run
Amount Unrecovered Core	Amount of core unrecovered from run
Unrecovered Interval	Depth interval(s) of each unrecovered core interval from run (if applicable)
Specimen ID/Permanent	Bar code label or unique specimen ID number
Specimen ID/Temporary	Two-digit ID number; first digit is run number and second digit is sequential order of removed specimens. Example: the first specimen removed from Run 1 would be designated "1-1"; the fourth specimen removed from Run 10 would be designated "10-4"
Package Type	"L" if packaged in lexan liner, "C" if packaged in can
Specimen Length	Measured length of removed specimen
Specimen Interval	Interval of removed specimen
Comments	Note weather conditions, extended length of time to process specimens, hydrologic conditions, etc.
Scale	Used to determine specimen and unrecovered core intervals



**INSTRUCTIONS FOR PREPARATION OF  
YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT  
SAMPLE MANAGEMENT FACILITY  
FIELD PHOTOGRAPHIC LOG  
YMP-014**

**HEADER INFORMATION**

- Borehole ID # Unique alphanumeric designation for borehole
- Cassette # Number sequentially assigned to each cassette; begin new log when starting new cassette
- Pagination Numbers sequentially assigned to sheets; first blank contains number of that particular sheet; second blank contains total number of sheets completed for the cassette
- Checked by/Date FO Staff's signature and date verifying that information on record is correct; cannot have taken videotape if signing here

**COLUMN INFORMATION**

- Run Number Number of run being videotaped
- Run Interval Interval of run being videotaped
- Counter Interval Counter interval (from/to) on video camera
- Remarks Documentation of any other feature being videotaped, including interesting item in core, drilling activity, etc.
- Photographer Photographer's initials and date



# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 21 of 23

## INSTRUCTIONS FOR PREPARATION OF YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY SHIFT DRILLING SUMMARY YMP-012

### HEADER INFORMATION

Borehole ID # Unique alphanumeric designation assigned to each borehole

Drilled Interval Total interval drilled during shift

Pagination Number sequentially assigned to sheets; first blank contains number of that particular sheet; second blank contains total number of sheets for the shift

Shift Start Date Date of beginning of shift

Shift Time Expressed in 24-hour timeclock (0000 - 2400 hrs)

Completed by/Date FO Geologist's signature and date

Checked by/Date FO Staff not directly responsible for completion of form

### SUMMARY OF ACTIVITIES

Summary of shift activities may include: drilling, testing, logging, or standby activities; equipment breakdown; unusual features or occurrences encountered; rig changeouts; inspections.

### GEOLOGIC INFORMATION

Provide gross lithologic description and structural information.

### RUN INFORMATION (Note: Record all amounts to nearest 0.1 ft)

# Run number

Interval Depth interval of run

Cut Amount of footage cut during run, as reported by driller

Recovered Amount of core recovered from run

Unrecovered Amount of core unrecovered from run

Unrecovered Interval Depth interval(s) of each unrecovered interval of core from run (if applicable)

% Recovered Total percent of core unrecovered from run

Verified By FO Staff not directly responsible for completion of this form; verify for each run; verify "Totals" in lower right-hand block

Total Totals of "cut", "recovered", and "unrecovered" columns; calculate % recovery

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 22 of 23

YMP-010-R0 4/17/91 WBS: _____ QA: _____		<b>YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY FIELD SPECIMEN REMOVAL CHECKLIST AND CONTRACT</b>			
Recipient _____ Address _____ Organization _____ Telephone (    ) _____ (FTS) _____ Courier _____					
By _____ Date _____ Borehole ID _____ RSED Director Authorization _____ Page ____ of ____					
SPECIMEN INFORMATION		CHECKLIST			
Specimen Number	Affixed?	Interval Removed	Foam Mkr?	Mkd/ Tag?	Pkgd? Desc.
		Date Created			
<b>SPECIMEN TRANSFER</b>					
Person Releasing Custody: _____		Person Accepting Custody: _____			
Date/Time _____		Date/Time _____			
SMF Use Only	Checked By _____ Date _____				

INSTRUCTIONS ATTACHED

BTP-SMF-008

# YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-013 STAGING, PACKAGING, AND  
DOCUMENTING NEUTRON-ACCESS BOREHOLE SAMPLES

Revision:  
0

Page 23 of 23

## INSTRUCTIONS FOR PREPARATION OF YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY FIELD SPECIMEN REMOVAL CHECKLIST AND CONTRACT YMP-010

### HEADER INFORMATION

Recipient Person accepting final custody of field specimens  
Address Recipient's address  
Organization Recipient's organization  
Telephone Recipient's telephone number; also FTS  
Courier Person accepting specimen in field or transporting specimen  
By/Date FO Staff determining authorization for removing specimens  
Borehole ID Unique alphanumeric designation assigned to borehole  
RSED Director  
Authorization Describe briefly  
Pagination Numbers sequentially assigned to sheets; first blank contains number of that  
sheet; second blank contains total number of sheets in that set of contracts

### SPECIMEN/CHECKLIST INFORMATION:

Specimen Number Write number in space; check "Affixed?" column when label with duplicate  
number affixed to specimen and/or container  
Interval Removed/  
Date Created Record interval removed and date created  
Foam Marker? Check when a labeled Field Specimen Removed marker has been placed in  
inner sleeve  
Marked/Tag? Check when specimen has been properly identified  
Packaged?  
Description Place orientation stripes and footages on packaging; include description of  
packaging material

### SPECIMEN TRANSFER

Person Releasing  
Custody FO Staff's signature/date/time of release of specimens  
Person Accepting  
Custody Person's signature/date/time of receipt of specimens

# YUCCA MOUNTAIN PROJECT ADMINISTRATIVE PROCEDURE



Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

## 1.0 PURPOSE AND SCOPE

This procedure defines requirements and responsibilities of selected Yucca Mountain Project (Project) participants for the management and disposition of Project borehole samples. Site activities affected by this procedure include handling and staging, field logging, core photography, documentation, packaging, and temporary storage of Project borehole samples.

## 2.0 APPLICABILITY

This procedure applies to Project participants and support contractors who handle, stage, photograph, field log, document, package, and store core, cuttings, fluids, and other borehole samples acquired at Project surface-based and subsurface-based drill sites. This procedure does not apply to those samples requiring alternative handling as directed by the Sample Overview Committee (SOC).

## 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 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). The staff consists of management and operations personnel who ensure that SM operations and documentation satisfy applicable regulatory and quality requirements.

### 3.2 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 include core, cuttings, fluids, and other geologic samples collected at Project borehole sites. The responsibility for the ultimate curation of samples is assigned to those Project entities whose functions include collecting samples and maintaining custody of those samples. This responsibility is subject to the transfer of custody requirements in the Project Office Branch Technical Procedures (BTPs) related to SM.

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#### APPROVALS

Effective Date 6/21/89	Revision 0	Project Manager <i>[Signature]</i>	Page 1 of 13	No. AP-6.2Q
	Supersedes	QA Manager <i>[Signature]</i>		

**YUCCA MOUNTAIN PROJECT**  
**ADMINISTRATIVE PROCEDURE**  
CONTINUATION PAGE

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

3.3 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.

3.4 CUTTINGS

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

3.5 SPECIMEN

A specimen is a subsection or portion that has been removed from a sample.

3.6 WHOLE CORE SPECIMEN

A whole core specimen is a subsection of whole core that constitutes the entire core sample recovered for the depth interval represented.

3.7 CORE RUN

A core run is an attempt to drill and recover a length of core. It is also core recovered from a core barrel after the attempted core run.

3.8 DRILLING PROGRAM PACKAGE

A Drilling Program Package, prepared for each borehole, is a set of plans describing the scope of work to be performed, the general and detailed requirements for performing the work, and the parameters to be used while drilling or performing work on Project boreholes. The Drilling Program Package consists of a work order, a Criteria Letter, a Drilling Program, and a Cost Estimate, and is prepared by the various participants responsible for those elements.

3.9 SAMPLE OVERVIEW COMMITTEE

The SOC is comprised of representatives from Los Alamos National Laboratory, Lawrence Livermore 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.

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		2 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT**  
**ADMINISTRATIVE PROCEDURE**  
CONTINUATION PAGE

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

4.0 RESPONSIBILITIES

4.1 PROJECT OFFICE SITE REPRESENTATIVE

The Project Office Site Representative (Site Representative) shall coordinate activities at Project borehole sites. The Site Representative or other Project Office Division level designee shall comply with requirements in Project Office Quality Management Procedure (QMP) QMP-01-02, Stop Work, should conflicts arise during work at Project borehole sites.

4.2 PRINCIPAL INVESTIGATOR (PI)

The PI or representative from a Participating Organization designated by the Project Office as having primary responsibility for a borehole shall provide lead technical support for the design, implementation, and completion of the borehole. The PI shall recommend suspension of activities at the borehole site when concerns about the technical quality of samples or borehole construction arise that would affect the useability of the samples or the borehole for scientific testing. Direct suspension of work will be discussed with the Site Representative.

4.3 NEVADA TEST SITE (NTS) SUPPORT CONTRACTORS

NTS Support Contractors affected by this procedure include Reynolds Electrical & Engineering Company, Inc. (REECO) and Pan Am World Services, Inc. (Pan Am). REECO drilling personnel will be responsible for general drilling services according to Project Administrative Procedure (AP) AP-5.10Q. Teamsters and Laborers assigned to SM will be responsible for sample handling activities. Pan Am will be responsible for photographing borehole samples on an as-needed basis.

4.4 PROJECT PARTICIPANTS

Project Participants (or designees) are responsible for preparing and submitting the appropriate documentation as required to remove selected borehole specimens from the drill site. The participant shall then sign a receipt for the specimens.

4.5 FIELD OPERATIONS MANAGER OF SAMPLE MANAGEMENT

The FO Manager of SM shall coordinate and administer basic borehole sample logging, sample documentation, sample marking and packaging,

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		3 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT**  
**ADMINISTRATIVE PROCEDURE**  
CONTINUATION PAGE

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

photography, and transfer of borehole samples to the SMF. Primary responsibilities will include interaction with the PI and the Site Representative to ensure acceptability of samples and documentation for curation at the SMF. The FO Manager will recommend suspension of any drill site activity that jeopardizes sample acquisition, quality, or documentation, if such suspension does not affect the useability of the sample or the borehole for scientific testing, as indicated by the PI.

4.6 FIELD OPERATIONS SHIFT SUPERVISOR OF SAMPLE MANAGEMENT

The FO Shift Supervisor of SM shall interact daily with participants to monitor drill site activities having an impact on the collection and documentation of quality borehole samples. The FO Shift Supervisor shall report shift activities to the FO Manager and shall ensure that all borehole sites are adequately staffed at all times.

4.7 FIELD OPERATIONS GEOLOGIST OF SAMPLE MANAGEMENT

The FO Geologist of SM shall perform geologic logging and sample handling activities at the drill site. These activities include depth validation, sample marking, packaging, and completion of required geologic field data logs and daily logs.

4.8 SAMPLE OVERVIEW COMMITTEE

The SOC shall be responsible for evaluating requests for samples relative to (1) Project goals, (2) participant sample needs, and (3) assurance of preservation of representative samples, as applicable.

5.0 PROCEDURE

5.1 INTRODUCTION

5.1.1 Sample management operations must ensure that Project samples and related documents and records will support a U.S. Department of Energy license application to the U.S. Nuclear Regulatory Commission to construct a geologic high-level nuclear waste repository. The initial staging and geologic logging of core at the drill site is the point at which depth assignments are made that become the reference points on which all future measurements for sample examinations and specimen removal are based. If these depth assignments are incorrect or indeterminate, the useability of analytical data derived from whole core and other specimens may be compro-

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		4 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT**  
**ADMINISTRATIVE PROCEDURE**  
CONTINUATION PAGE

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

mised. These initial activities significantly impact the entire sample management process.

5.1.2 This procedure describes interfaces of participant personnel at the drill site, methods to be followed and documentation to be prepared during handling and field logging of all borehole samples, and records control. A copy of this procedure with supporting documents and forms will be available at the drill site at all times. The Drilling Program Package that controls drill site activities for the specific borehole will also be available at the drill site. During the course of activities described by this procedure, all borehole samples and sample containers will either be in constant visual contact by field personnel or will be in access-restricted storage.

## 5.2 INTERFACES

5.2.1 Organizational interfaces at Project borehole sites are shown in Exhibit 1. The Site Representative shall direct activities at Project borehole sites with direct supervision over T&MSS staff and shall interface with the NTS Office.

5.2.2 The PI assigned to a particular hole shall interface with the Site Representative, the FO Shift Supervisor, and the FO Geologist.

5.2.3 The FO Shift Supervisor shall direct daily shift activities by FO staff. The FO Shift Supervisor shall direct the SM-assigned Teamster and Laborer and Pan Am personnel, if required. The FO Manager will interact with the PI and the Site Representative to monitor the implementation of the drilling plan (formalized in the Drilling Program Package) as it relates to sample collection and sample quality.

## 5.3 FACILITIES AND EQUIPMENT

Portable logging facilities will be erected at the drill site. Necessary supplies and documentation forms will be available.

## 5.4 DOCUMENTATION

Accurate and complete documentation of field operation activities is critical for a successful license application. The geologist, or other responsible participants as affected, will maintain a log at all times at the drill site, documenting activities affecting the daily scope of drill

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		5 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT**  
**ADMINISTRATIVE PROCEDURE**  
CONTINUATION PAGE

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

site operations. All entries in this log will be written in black ink, initialed, and dated.

#### 5.5 CORE HANDLING

Core handling procedures shall be performed in the following sequential order according to procedures described in BTP-SMF-008, Field Logging, Handling, and Documenting Borehole Samples. 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.

##### 5.5.1 Staging

5.5.1.1 REECo staff will remove the core run from the core barrel and carry it to the logging facility. REECo drilling staff shall supply proper documentation indicating the depth interval and the top of the run. This shall include, but is not limited to, adequately annotated documentation from a calibrated depth-recording device.

5.5.1.2 The core length will be cleaned if necessary, then fitted together to reconstruct in situ conditions. Marks will be made on the core to ensure that all unnatural breaks (those inadvertently or purposely caused by site personnel) are recognized.

5.5.1.3 The core will be measured to the nearest one tenth of a foot (0.1 ft). Subtracting the amount recovered from the amount cut determines whether a core loss exists. The amount of core cut, recovered, and lost will be documented. Core losses will be assigned depths as accurately as possible using relevant information from the drilling operations and core observation. Standard drilling industry procedures shall be used to ensure that all of the core is recovered from the hole, i.e., that none of the core is left at the bottom of the hole as a stub.

5.5.1.4 Permanent markers will be used to place a pair of colored (two different colors) orientation stripes lengthwise on all core to ensure that a piece of core cannot be inadvertently switched end-for-end. Footage marks will be written directly on the core at one-foot intervals.

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		6 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT**  
**ADMINISTRATIVE PROCEDURE**  
CONTINUATION PAGE

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

5.5.2 Photodocumentation of Core

Pan Am or SM personnel with proper clearance shall take initial photographs of the core immediately after it has been staged, as described above. The borehole number, film roll number, exposure number, and the interval of core photographed by that exposure will be documented on a suitable photographic log by the photographer. After photodocumentation of the core run, the core is ready to be geologically logged unless the removal of whole core specimens from the drill site is required.

5.5.3 Removal of Whole Core Specimens From the Drill Site

5.5.3.1 It may be occasionally be necessary to immediately remove and seal intervals of whole core directly from the drill site and release them to a participant. Release of whole core from the drill site to a participant shall be approved according to AP-6.4Q and prepared for release according to AP-6.3Q and BTP-SMF-008. These instances shall be directed by the Director of the Regulatory and Site Evaluation Division (RSED), Project Office. No core will be removed from the field before it has been staged and photographed as described above. Whenever possible, the core will be logged as described in Section 5.5.4 before removal from the field.

5.5.3.2 The Whole Core Specimen Field Removal Checklist and Contract (contract [Exhibit 2]) will be completed as whole core specimens are removed from the drill site. The following steps shall be followed:

1. Prior to field operations, the SOC will recommend to the RSED Director requests from participants for whole core specimen removal (AP-6.4Q). The RSED Director may then approve the recommendations.
2. The approved request will be compared to the participant's interval pick, unit, or feature of interest (as applicable) at the drill site. Conflicts will be resolved by the RSED Director.
3. The whole core interval will be removed and documented by FO personnel.
4. The whole core specimen will be photographed and the information entered on an appropriate photographic log.

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		7 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT**  
**ADMINISTRATIVE PROCEDURE**  
CONTINUATION PAGE

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

5. The segregated specimen will be packaged to the participant's specifications.
6. The participant or designee and the wellsite geologist will sign and date the contract.
7. The specimen and a copy of the contract will then be released directly to the participant.

#### 5.5.4 Core Logging

Geological core logging by FO staff will occur in two distinct phases: recording structural information and recording lithologic information. These field logs are preliminary only and will not necessarily represent the final interpretation of geologic conditions; rather, they will primarily serve as traceability documentation.

##### 5.5.4.1 Structural Logging

Features of structural significance will be logged on a structure log. These include natural breaks, as well as coring and handling induced breaks. Fracture zones, lithophysal void zones, and rubble zones are also recognized and described, as are piece lengths, core losses, and fracture mineralization.

##### 5.5.4.2 Lithologic Logging

All lithologic information derived from core and cuttings observation will be entered on a lithologic log by the wellsite geologist. A standard logging format will be utilized to ensure that important comparative features of a lithologic unit are noted.

#### 5.5.5 Loading and Labeling of Core Boxes

Core will be cut by FO staff as necessary and loaded into boxes in the same order as it was staged. Boxes will be labeled with borehole information and the interval of the core contained within the box.

#### 5.5.6 Photodocumentation and Sealing of Boxed Core

Boxed core will also be photographed, as described in Section 5.5.2, prior to sealing. An instant print photograph of the core will be made and

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		8 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT**  
**ADMINISTRATIVE PROCEDURE**  
CONTINUATION PAGE

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

placed in the box. The core boxes will then be sealed and, if necessary, placed in secure, temporary storage at the drill site.

#### 5.6 CUTTINGS HANDLING

Cuttings that represent the targeted interval will be collected and logged by FO staff or the PI and placed in a location suitable for geologic logging (BTP-SMF-008). A sufficient quantity of representative cuttings will be collected, unless otherwise specified by the SOC or the RSED Director.

##### 5.6.1 Logging

Cuttings will be laid out in rows suitable for logging. Lithologic descriptions shall be similar to core descriptions as described in Section 5.5.4.2 and recorded on a lithologic log.

##### 5.6.2 Bagging

Cuttings samples will be placed in bags. The bags will be labeled with borehole and depth information.

##### 5.6.3 Boxing, Labeling, and Sealing

After cuttings have been bagged and labeled, they will be boxed in a manner similar to core boxing. The boxes will be labeled with borehole and depth information and sealed in preparation for secure, temporary storage at the drill site.

#### 5.7 OTHER BOREHOLE SAMPLES

The same standards for handling, labeling, and sealing of core and cuttings as described in this procedure shall apply to any other borehole samples collected and logged at the drill site by FO staff or participant personnel (BTP-SMF-008).

#### 5.8 TEMPORARY STORAGE OF BOREHOLE SAMPLES

Provisions for temporary storage of borehole samples will include a lockable facility protected from moisture, wind, and freezing temperatures. It will also have sufficient space to accommodate other drill site samples.

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		9 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT**  
**ADMINISTRATIVE PROCEDURE**  
CONTINUATION PAGE

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

Borehole samples designated for curation by the SMF shall be transmitted from the site to the SMF at least every 24 hours during borehole sample recovery periods.

5.9 IDENTIFICATION AND RESOLUTION OF DISCREPANCIES

5.9.1 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.

5.9.2 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.

5.9.3 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.

5.10 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 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. Segregation of a nonconforming item or termination of a nonconforming activity will be done according to QMP-15-01.

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		10 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT**  
**ADMINISTRATIVE PROCEDURE**  
CONTINUATION PAGE

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

6.0 REFERENCES

- AP-5.10Q, Use of NTS Contractors on the NNWSI Project.
- AP-6.3Q, Interaction of Participants and Outside Interests with Yucca Mountain Project Sample Management.
- AP-6.4Q, Approval Procedure for Requests for Yucca Mountain Project Geologic Specimens.
- BTP-SMF-008, Field Logging, Handling, and Documenting Borehole Samples.
- QMP-01-02, Stop Work.
- QMP-15-01, Control of Nonconformances.
- QMP-17-01, Record Source and Record User Responsibilities.
- Yucca Mountain Project QAP, NNWSI/88-9, Rev. 2.

7.0 APPLICABLE FORMS

- Exhibit 1. Field Operations Organizational Interfaces and Key Personnel.
- Exhibit 2. Whole Core Specimen Field Removal Checklist and Contract.

8.0 RECORDS

The SM Manager 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 every 10 business days. Copies of these records will be retained by the SMF and stored at the SMF Documents Center.

- 1. Whole Core Specimen Field Removal Checklist and Contract.

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		11 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT  
ADMINISTRATIVE PROCEDURE  
CONTINUATION PAGE**

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

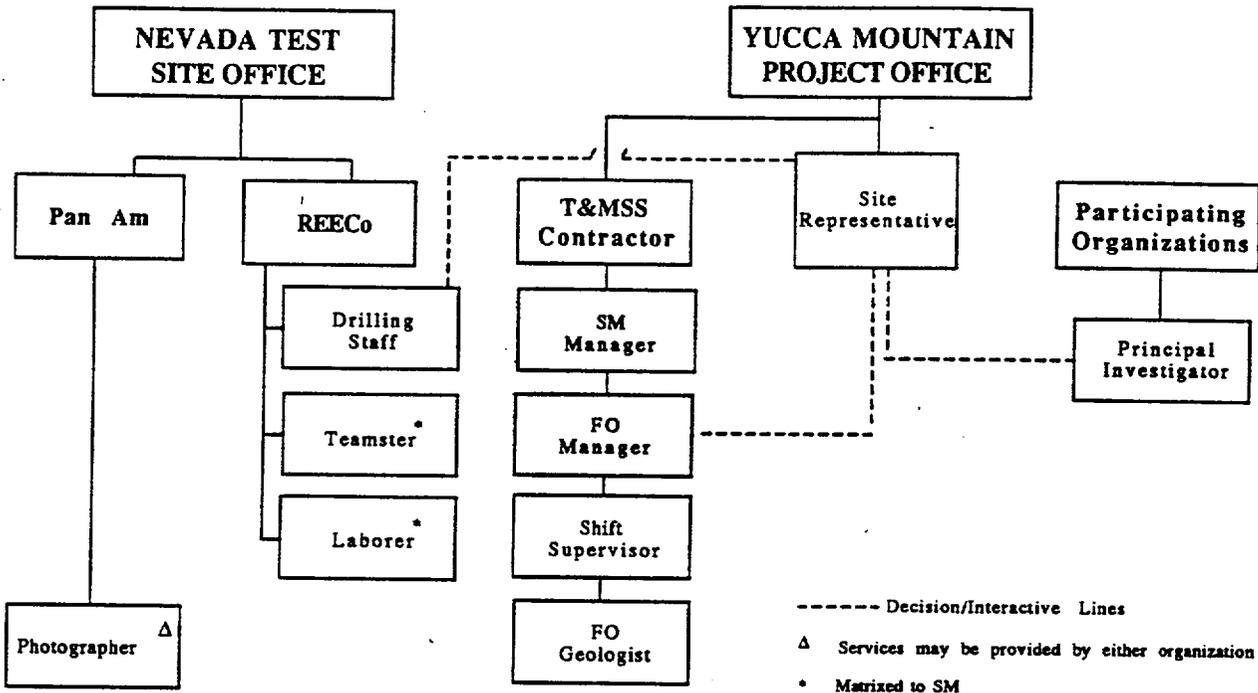


Exhibit 1. Field Operations Organizational Interfaces and Key Personnel.

Effective Date	Revision	Supersedes	Page	No.
6/21/89	0		12 of 13	AP-6.2Q

**YUCCA MOUNTAIN PROJECT  
ADMINISTRATIVE PROCEDURE  
CONTINUATION PAGE**

N-AD-001  
10/88

Title AP-6.2Q MANAGEMENT AND OPERATION OF SAMPLE HANDLING ACTIVITIES AT BOREHOLE SITES

YUCCA MOUNTAIN PROJECT SAMPLE MANAGEMENT FACILITY						
WHOLE CORE SPECIMEN FIELD REMOVAL CHECKLIST AND CONTRACT					BTPSMF8-2 5/89	
Recipient _____		Address _____				
Organization _____						
Telephone ( ) _____ (FTS) _____						
Courier _____						
Completed By _____		Date _____		PLACE SHP BAR CODE LABEL HERE		
RSED Director Authorization _____						
Borehole ID _____		Page _____ of _____				
SPECIMEN INFORMATION				CHECKLIST		
SPC Bar Code Label	Affixed?	Interval Removed Date Created	Foam Mkr?	Mkd/ Tag?	Pkgd? Desc.	Photo?
PLACE SPC BAR CODE LABEL HERE						
PLACE SPC BAR CODE LABEL HERE						
PLACE SPC BAR CODE LABEL HERE						
PLACE SPC BAR CODE LABEL HERE						
I hereby acknowledge receipt of the specimens listed above. Please return all remnant material to the Sample Management Facility when no longer needed.						
Recipient _____ Date _____ Time _____ am pm						
SMF Use Only	Checked By _____					Date _____

Exhibit 2. Whole Core Specimen Field Removal Checklist and Contract.

Effective Date 6/21/89	Revision 0	Supersedes	Page 13 of 13	No. AP-6.2Q
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