



Department of Energy

Washington, DC 20585

April 10, 1992

Mr. Joseph J. Holonich, Director
Repository Licensing and Quality Assurance
Project Directorate
Division of High-Level Waste Management
Office of Nuclear Material Safety
and Safeguards
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Holonich:

The U.S. Nuclear Regulatory Commission's (NRC) letter of February 20, 1992, closed Open Item Number 3-90 that pertained to NRC's receipt of DOE's core handling procedures for their information. In this letter NRC identified some inconsistencies relevant to these procedures. Enclosure 1 provides a response to the concerns listed in Attachment 2 of the above letter. Many of the inconsistencies noted by NRC have already been identified by the Yucca Mountain Site Characterization Project Office and field personnel responsible for implementing the procedures as a result of experience accumulated after drilling began on September 23, 1991. Revision and replacement of some procedures have been completed or initiated. Enclosure 3 provides a listing of the core sample handling procedures currently in effect and their status. Uncontrolled copies of these procedures are provided as Enclosures 4-12.

The NRC's letter made other general inquiries. Questions that pertain to the curation and temperature for core sample curation are inquiries that can be satisfied through interactions with the NRC's Onsite Representative (OR). A LM-300 drilling schedule, work (sic) packages, and drilling procedures will be supplied to the OR upon request.

As a point of information, there are no "work packages" related to drilling. There are test planning packages that describe the scientific scope for drilling and testing. Also, there are job packages to control the field activity and work programs to provide details of the drilling\testing sequence. An approved test planning package exists for the UZ-16 hole, and a job package for drill pad construction is approved. The job package and work program for drilling and testing will be approved by the time NRC receives this letter. The drilling procedures used by Reynolds Electrical and Engineering Co., Inc. are also available to the OR.

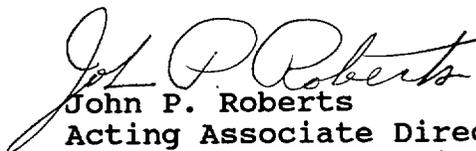
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UZ-16 drilling will commence as soon as the tracer permit is received or an exemption provided and the LM-300 rig crew is ready to begin drilling operations.

If you have any questions regarding these procedures, please contact Linda Desell at (202) 586-1462.

Sincerely,



John P. Roberts
Acting Associate Director for
Systems and Compliance
Office of Civilian Radioactive
Waste Management

Enclosures:

- on this self*
1. NRC-Identified Procedural Inconsistencies
 2. DOE Response to Inconsistencies
 3. YMPO Core Sample Handling Procedure Status
 4. BTP-SMF-002, Revision 2
 5. BTP-SMF-005, Revision 2
 6. BTP-SMF-006, Revision 2
 7. BTP-SMF-007, Revision 0, ICN 2
 8. BTP-SMF-008, Revision 0, ICN 1
 9. BTP-SMF-010, Revision 0
 10. BTP-SMF-013, Revision 0, ICN 2
 11. AP-6.3Q, Revision 0, ICN 2
 12. AP-6.4Q, Revision 1

cc: w/o enclosure:

C. Gertz, YMPO
K. Hooks, NRC
R. Loux, State of Nevada
M. Baughman, Lincoln County, NV
J. Bingham, Clark County, NV
B. Raper, Nye County, NV
P. Niedzielski-Eichner, Nye County, NV
G. Derby, Lander County, NV
P. Goicoechea, Eureka, NV
C. Schank, Churchill County, NV
F. Mariani, White Pine County, NV
V. Poe, Mineral County, NV
E. Wright, Lincoln County, NV
J. Pitts, Lincoln County, NV
R. Williams, Lander County, NV
J. Hayes, Esmeralda County, NV
M. Hayes, Esmeralda County, NV
B. Mettam, Inyo County, CA



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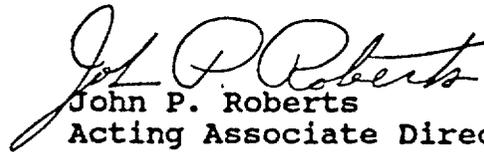
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UZ-16 drilling will commence as soon as the tracer permit is received or an exemption provided and the LM-300 rig crew is ready to begin drilling operations.

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4. BTP-SMF-002, Revision 2
5. BTP-SMF-005, Revision 2
6. BTP-SMF-006, Revision 2
7. BTP-SMF-007, Revision 0, ICN 2
8. BTP-SMF-008, Revision 0, ICN 1
9. BTP-SMF-010, Revision 0
10. BTP-SMF-013, Revision 0, ICN 2
11. AP-6.3Q, Revision 0, ICN 2
12. AP-6.4Q, Revision 1

*read with letter
dated 12/8/92*

CORE SAMPLE HANDLING PROCEDURES

AP-6.2Q, Rev. 0, effective 6/21/89.

AP-6.3Q, Rev. 0, effective 6/21/89 + ICN 1 effective 4/24/90.

AP-6.4Q, Rev. 0, effective 7/28/89 + ICN 1 effective 4/24/90
and ICN 2 effective 10/17/90.

AP-6.6Q, Rev 0, effective 6/21/89 + ICN 2 effective 4/24/90.

BTP-SMF-001, Rev. 1, effective 10/26/90.

~~BTP-SMF-002, Rev. 2, effective 8/19/91.~~

BTP-SMF-005, Rev. 2, effective 6/18/91.

BTP-SMF-006, Rev. 2, effective 3/14/91.

BTP-SMF-007, Rev. 0, effective 7/7/89 + ICN 1 effective 6/13/90
and ICN 2 effective 7/1/91.

BTP-SMF-008, Rev. 2, effective 7/15/91.

BTP-SMF-010, Rev. 0, effective 3/14/91.

BTP-SMF-013, Rev. 0, effective 9/20/91.

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PROCEDURAL INCONSISTENCIES WITH CORE SAMPLE HANDLING PROCEDURES

- o AP-6.2Q, BTP-SMF-001, BTP-SMF-007 and BTP-SMF-010 still identify the Sample Management organization as part of the Technical and Management Support Services organization, rather than as part of the Yucca Mountain Site Characterization Project Office.
- o AP-6.6Q describes the Exploratory Studies Facility as having vertical access shafts excavated by drill and blast methods, rather than ramps excavated by tunnel boring machines.
- o AP-6.2Q does not require USGS personnel to be present during drilling and core sample processing operations, although the USGS is still responsible for establishing requirements for the processes and developing the final core log.
- o AP-6.2Q, Section 5.5 calls for the core to be photographed after the core staging process is complete. The NRC staff suggested that the core be photographed immediately after the inner core barrel containing the core is opened in the May 8, 1990 letter. BTP-SMF-008 requires videotaping core before taking samples.
- o Although AP-6.2Q, Section 5.5 references BTP-SMF-008 and requires compliance with such, the two procedures are internally inconsistent with regard to core handling procedures.
- o BTP-SMF-010 references BTP-SMF-004, which Shelor's letter to Linehan dated March 25, 1991, says was incorporated into BTP-SMF-002.

Enclosure 1

PROCEDURAL INCONSISTENCIES WITH CORE SAMPLE HANDLING PROCEDURES

- o AP-6.20, BTP-SMF-001, BTP-SMF-007 and BTP-SMF-010 still identify the Sample Management organization as part of the Technical and Management Support Services organization, rather than as part of the Yucca Mountain Site Characterization Project Office.
- o AP-6.60 describes the Exploratory Studies Facility as having vertical access shafts excavated by drill and blast methods, rather than ramps excavated by tunnel boring machines.
- o AP-6.20 does not require USGS personnel to be present during drilling and core sample processing operations, although the USGS is still responsible for establishing requirements for the processes and developing the final core log.
- o AP-6.20, Section 5.5 calls for the core to be photographed after the core staging process is complete. The NRC staff suggested that the core be photographed immediately after the inner core barrel containing the core is opened in the May 8, 1990 letter. BTP-SMF-008 requires videotaping core before taking samples.
- o Although AP-6.20, Section 5.5 references BTP-SMF-008 and requires compliance with such, the two procedures are internally inconsistent with regard to core handling procedures.
- o BTP-SMF-010 references BTP-SMF-004, which Shelor's letter to Linehan dated March 25, 1991, says was incorporated into BTP-SMF-002.

Enclosure 2

Response to Procedural Inconsistencies

Comment #1 - Identification of sample management organization as part of Technical and Management Support Services (TMSS) rather than Yucca Mountain Project Office.

Response: The Drilling Support and Sample Management Department of TMSS provides support to the Yucca Mountain Project Office in the area of sample management. All related quality affecting activities are performed and controlled under the Office of Civilian Radioactive Waste Management (OCRWM) Quality Assurance Program.

Comment #2 - AP-6.6Q describes Exploratory Studies Facility (ESF) vertical access shafts excavated by drill and blast methods rather than excavated ramps through use of tunnel boring machines (TBMs).

Response: AP-6.6Q is in the process of being reviewed for cancellation. Changes will be made to all procedures, as necessary, to reflect the current plans for ESF ramp excavation by TBMs.

Comment #3 - USGS personnel are not required to be present during drilling and sampling operations, although they are responsible for establishing requirements for processes and developing the final core log.

Response: Job Packages, as described in AP-5.21Q, "Field Work Activation," are now the mechanism for defining USGS and other Participant responsibilities with regard to personnel on site during drilling and core sampling processing operations. Special sample handling requirements are incorporated into appropriate sampling procedures or sampling instructions prior to the start of work. Special sampling instructions (e.g., sampling requests from a particular interval) are identified in sample requests presented to the Sample Overview Committee (SOC) (AP-6.4Q). Approval of the requests may result in development of instructions for sampling, special handling, or packaging. The Drilling Support and Sample Management Department of TMSS is responsible for core sampling and processing operations which are performed under approved procedures. They are also responsible for development of a preliminary field composite borehole log. Development of the final core log is a USGS responsibility.

Response to Procedural Inconsistencies
(continued)

Comment #4 - AP-6.2Q and BTF-SMF-008 are inconsistent as to when core is photographed. NRC suggests that core be photographed immediately after the inner core barrel has been opened.

Response: Agree. BTF-SMF-008 has been revised to reflect this comment. Cancellation of AP-6.2Q was approved by the Yucca Mountain Project Office on March 19, 1992, after a determination was made that all requirements contained in AP-6.2Q were satisfied in other existing procedures.

Comment #5 - Procedures AP-6.2Q and BTF-SMF-008 are internally inconsistent with regard to core handling.

Response: Agree. Disconnects between AP-6.2Q and BTF-SMF-008 were also noted by the Project Office during several informal reviews. As a result, AP-6.2Q was cancelled (see Comment #4 response) and BTF-SMF-008 is now the primary core handling procedure used.

Comment #6 - BTF-SMF-010 references a nonexistent procedure (BTF-SMF-904).

Response: BTF-SMF-010, Gamma-Ray Logging of Yucca Mountain Project Core, has never been implemented with regard to quality affecting activities as part of site characterization. The procedure, however, is currently being revised to reflect TMSB organizational changes and cancellation of BTF-SMF-004.

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and acceptance procedures regarding sample submissions requirements set forth in this level. 42-6.30 contains the instructions for a consultation. Status procedure is expected to be

selected samples and documentation acceptance for duration by the sample management facility of

BIR-SMR-007, Rev. 0, ICM 2

07/01/91

interface documents. changes in level organization and approval. Review for defect was submitted in February for review. Status: Minor revisions to procedure were submitted in February for review and approval. Revisions reflect changes in level organization and interface documents.

Removal of title and other specimens for testing by the SME

BIR-SMR-006, Rev. 2

03/14/91

interface documents. changes in level organization and approval. Review for defect was submitted in February for review. Status: Minor revisions to procedure were submitted in February for review and approval. Revisions reflect changes in level organization and interface documents.

Management facility. Revisions to the sample management facility.

BIR-SMR-005, Rev. 2

05/23/91

documents. organization and interface. reflect changes in level review and approval. Revisions were submitted in February for review and approval. Revisions reflect changes in level organization and interface documents.

for SME. and processing of boronide samples. Transport, receipt, acceptance,

BIR-SMR-002, Rev. 2

08/19/91

Document title and status

Document ID

core sample handling procedures

Enclosure 3

Core Sample Handling Procedures
(continued)

<u>Document ID</u>	<u>Document Title and Status</u>	<u>Effective Date</u>
BTP-SMF-008, Rev. 2, ICN 1	Field Logging, Handling, and Documenting Borehole Samples	02/05/92
	Status: Minor revisions to procedure were submitted in February for review and approval. Revisions reflect changes in Texas organization and will aid in ease of implementation.	
BTP-SMF-010, Rev. 0	Gamma-Ray Logging of Yucca Mountain Project Core	03/14/92
	Status: Minor revisions to procedure were submitted in March for review and approval. Revisions reflect changes in Texas organization and will delete reference to non-existent procedure.	
BTP-SMF-013, Rev. 0, ICN 2	Staging, Packaging, and Documenting Neutron-Access Borehole Samples	01/13/92
	Status: Minor revisions to procedure were submitted in February for review and approval. Revisions reflect changes in Texas organization, Management and Operation of Services, and Training Activities at Southwestern.	
	Status: Approved for cancellation on 05/19/92.	
AP-6.3Q, Rev. 0, ICN 2	Interaction of Participants and Outside Interests with Yucca Mountain Project Sample Management	03/11/92
	Status: Procedure is currently being revised to reflect changes in Texas organization and to modify documentation of access to and control of Yucca Mountain geologic samples and specimens. Information from the current revision of the procedure will be extracted and used to create a new procedure to cover requirements for documentation of non-borehole samples (ex., trench samples).	

Core Sample Handling Procedures
(continued)

<u>Document ID</u>	<u>Document Title and Status</u>	<u>Effective Date</u>
AP-6.40, Rev. 1	Procedure for the Submittal, Review, and Approval of Requests for Yucca Mountain Project Specimens	03/11/92
	<u>Status:</u> Procedure is currently being revised to update the forms and include additional requirements on core traceability. It will also reflect TAMSS organizational changes.	
AP-6.60, Rev. 0, ICN 1	Field Collection, Documentation, and Specimen Removal of Exploratory Shaft and Drift Rock	04/24/90
	<u>Status:</u> Submitted in February for cancellation review.	

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PHYSICAL PROCESSING AND STORAGE OF CORE AND CUTTINGS AT THE SAMPLE MANAGEMENT FACILITY	BTP-SMF-004	0
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1.0 PURPOSE AND SCOPE

This procedure describes the Yucca Mountain Project Office (Project Office) requirements and responsibilities for the physical processing and storage of Yucca Mountain Project (Project) core and cuttings at the Sample Management Facility (SMF).

2.0 APPLICABILITY

This procedure applies to Technical and Management Support Services (T&MSS) contractor personnel and support staff performing physical processing and storage of Project core and cuttings at the SMF.

3.0 DEFINITIONS

3.1 Sample Management (SM)

SM of the T&MSS contractor is the organization responsible for the collection, documentation, storage, and control of selected samples, remnants and records. SM includes the SMF and Field Operations. 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 requesters. 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. Samples covered by this procedure include core and cuttings collected at Project field sites.

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.

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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 Archival-Research Borehole Sample Processing System

The archival-research borehole sample processing system of sample preservation is based upon splitting a representative sample of core or cuttings from the total collected sample, one of which is preserved as an archive (archival split), the other of which is available for research and analysis (research split). A critical factor in the application of this system is the availability of core of a certain minimum diameter (approximately 3.0"). The system in place at the SMF requires that the core be split longitudinally off-center, resulting in an approximately 1/3 archival split and 2/3 research split.

3.7 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.

3.8 Curatorial Sample Inventory and Tracking System (CSITS)

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

4.0 RESPONSIBILITIES

4.1 Curator

The Curator shall supervise SMF staff members performing physical processing and storage activities on borehole and other geologic samples. If authorized by the Curator after consultation with the SOC, the core will be moistened with a water spray to enhance the colors for photographic purposes.

4.2 Technical Staff Assistant (TS)

The TS Assistant shall ensure that activities performed during this procedure conform to quality assurance (QA) guidelines.

4.3 Sample Management Facility Geotechnician

The SMF Geotechnician will perform the following core processing and storage activities: sample splitting, placing in containers, labeling, subsampling, and storing. The SMF Geotechnician will conduct the following cuttings processing and

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storage activities: cleaning of samples, bagging, placing in containers, labeling, subsampling, and storing.

4.4 Sample Management Facility Administrative Assistant

The SMF Administrative Assistant shall submit original QA records resulting from the implementation of this procedure to the T&MSS Local Records Center (LRC).

4.5 Reynolds Electrical & Engineering Company, Inc. (REECO)

REECO Teamsters and Laborers shall assist in handling and shelving of sample containers and will operate trucks and other material-handling equipment.

4.6 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.

5.0 PROCEDURES

5.1 Introduction

Core and cuttings acquired from Project field sites shall be processed after arrival at the SMF. The purposes of processing these samples are: (1) to photograph core, and (2) to achieve and maintain traceability on these samples acquired during Project site characterization activities. In addition to the purposes for processing, core greater than 3" diameter and cuttings will be divided (1) to prepare an archival split for future reference, and (2) to prepare a research split for scientific data-gathering activities. Samples will undergo different phases of processing, depending upon the condition of the sample and the analytical data to be derived. At the discretion of the Director of the Regulatory and Site Evaluation Division (RSED), Project Office, some core greater than 3" diameter will be left whole for analytical purposes or because it is too unconsolidated for slabbing. An archival split shall be cut from whole core or separated from cuttings (approximately 50 grams). The research split of core shall be photographed and placed in the appropriate storage location. At the discretion of the Curator, the archival split may be photographed in addition to or instead of the research split.

5.2 Core Processing

Requested whole core larger than 3" diameter that is selected by participants during a Core Examination Meeting (Project Office Branch Technical Procedure [BTP] BTP-SMF-005) shall be segregated from the rest of the core prior to slabbing. The

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reserved whole core specimens held out from processing (BTP-SMF-006) shall have the approval of the RSED Director. Following verification of sample documentation (BTP-SMF-003) and selection and removal of whole core specimens, the remaining whole core will be slabbed, marked, packaged, and stored. Core less than 3" diameter will be verified, permanently marked, packaged, and stored.

5.2.1 Facilities

The core processing room will be equipped with electrical service, compressed air, running water, and drain lines with sediment traps.

5.2.2 Equipment

Core processing equipment will include, but is not limited to:

Self-feeding core slabbing saws	Ear and eye protection
Work tables equipped with casters	Core marking supplies
Measuring rules marked in tenths of a foot	Polystyrene core cradles
Dust collection system for dry slabbing	Pneumatic staple guns
Polyvinyl chloride (PVC) half-tubes	Core boxes
Polyethylene lay-flat tubing	

5.2.3 Core Slabbing Documentation

Information from CSITS will be used to generate one Core Slabbing/Boxing Checklist (Figure 1) per box to document the various steps in the slabbing process of whole core. The top portion of the checklist will include the borehole identification (ID) and other information specific to the core in that box (i.e., container interval, sample status). The lower portion of the Core Slabbing/Boxing Checklist will be divided into pre-slabbing and post-slabbing sections and provides space for each activity in the process to be documented by the SMF Geotechnician performing it. During slabbing, the Core Slabbing/Boxing Checklist will be stored in a document cache mounted inside the lid of each box. Core that measures less than 3" diameter (small bore core) will not be slabbed. Individual steps in the Core Slabbing/Boxing Checklist that do not apply to small bore core will be marked "N/A" during core processing.

5.2.4 Core Box Preparation

5.2.4.1 Prior to the removal of the whole core from the field box in preparation for slabbing, another box of the same size will be constructed and include polystyrene cradles sized to fit the archival split of core. Polystyrene core status and whole core specimen markers will be placed in the research split box at the appropriate positions, and duplicates will be made and placed in the archival split box. Labels for these markers will be generated using information in CSITS. After the core from a field box has been slabbed, the field box will be used to hold the research split of core, and the newly constructed box will hold the archival split of core. Information from

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CSITS will be used to generate five labels for each box, including borehole ID, box interval, and an index of sample interval statuses as they will exist immediately after slabbing (Figures 2 and 3). Labels will be affixed to both ends and one side of the core box lid and to both ends of the body of each archival or research split box. After all the core (excluding whole core specimens) from a borehole has been slabbed and boxed, a sequential box number will be laminated to the box (i.e., Box 3 of 246). Core less than 3" diameter will remain in the same box in which it was received from the field. Permanent labels for boxes containing 3" or less diameter core will contain the same information as the research core box labels.

5.2.4.2 The whole core (3" diameter or larger) will be removed from the field core box and placed one row at a time in PVC half-tubes fastened to a work table. Both the archival and research core box interiors will be marked at the top and bottom of each row to indicate the total depth interval represented in that row (i.e., core, missing core, whole core specimens removed, etc.).

5.2.5 Orientation Stripes and Depth Mark Finalization and Duplication

On core larger than 3" diameter, a second set of permanent orientation stripes will be placed 180° from the existing orientation stripes on the core. The blue footage indicator will be extended with a permanent marker to completely circumscribe the core. Depth indicators will be permanently marked in blue and appropriately located on both sides of the core (Figure 4). Core less than 3" diameter will have the temporary field markings replaced by permanent markings. These markings will not be duplicated as on core 3" diameter or larger.

5.2.6 Slabbing of Core

5.2.6.1 Approximately 3 ft of whole core (3" diameter or larger) from the work table will be placed in the core sawing jig with the top end to the operator's left and the original field orientation stripes facing outward toward the saw operator. The core shall be slabbed longitudinally into the approximately 1/3 archival split and 2/3 research split, each portion containing identical markings. The core will be slabbed with a diamond saw blade. Cores will be slabbed using water as the coolant/lubricant, or with a special dry-cutting sawblade. When the dry-cutting sawblade is used, a dust collection system will be used to control air quality within the saw room.

5.2.6.2 Rubble will be removed from the field transport bag and laid out on the work table. An approximate 1/3 - 2/3 diameter longitudinal split will be made on the rubble sample. Each split will be rebagged separately in 8" wide, 4-mil thick polyethylene lay-flat tubing, with a minimal amount of disturbance to the sample. Rubble from core less than 3" diameter will be bagged, but not split into archival and research portions. Each bag will be marked with orientation marks and depth indicators and placed in its respective box, row, and position.

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5.2.7 Final Markings on Slabbed Core

After slabbing, the research split of core will be removed from the saw jig first, the archival split afterwards. Both splits of core will be laid out in the Core Processing Area, with the 1/3 and 2/3 splits placed face down, parallel to each other, and oriented correctly. Any markings that may have been obscured during slabbing shall be verified using the Core Status section of the Core Slabbing/Boxing Checklist (Figure 1) before being redrawn. The core will then be placed in its respective row and box.

5.2.8 Photography of Split Core

The core, whether newly slabbed (3" diameter or larger) or whole (less than 3" diameter), shall be photographed to record its initial condition, position in the box, orientation, and color. The Core Photography Log (Figure 5), used to document photography of the core, includes borehole ID, photographer's name and organization, film speed and f-stop, and date. Information on each exposure will include the following: exposure number, RCT (research) or ACT (archive) bar code number, box interval, missing footage status, and remarks. A Nevada Test Site (NTS) Support Contractor or the SMF staff shall be responsible for photographing the core. The SMF Geotechnician will complete this log as the photographs are taken and will initial and date the action.

5.2.8.1 Methods

5.2.8.1.1 The core and labeling cards will be arranged as shown in Figure 6. The borehole ID, RCT or ACT bar code number, box depth interval, date photographed, missing and whole core specimen interval markers, grey scale, and color scale will be displayed in each shot.

5.2.8.1.2 A box of research or small bore core will be placed with the shallower end of the interval in the lower left of the box stand. The box and photographic marquees will be outlined with tape to facilitate placement for subsequent shots. Labels will be in place to represent missing core and to explain discontinuous intervals (e.g., whole core specimens). If authorized by the Curator after consultation with the SOC, the core will be moistened with a water spray to enhance the colors. Core placement and camera focus shall be checked to ensure correct arrangement and legibility of labels. The SMF Geotechnician will record the exposure numbers, replace the core box lid, and remove the box from the box stand.

5.2.8.1.3 The developed exposures shall be examined by an SMF staff member to ensure that all boxes of core have been photographed and that the exposures are adequate to document the condition of the core. A list of any unsatisfactory or missing photographs will be made and the photographs will be retaken.

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5.2.8.2 Handling and Archiving of Prints and Negatives

A minimum of three set of prints shall be maintained, one by the SMF Documents Center and two by the T&MSS LRC. The NTS Support Contractor or the SMF shall submit the original negatives to the T&MSS LRC. An index of each borehole photographic record will be kept in the resepective notebook.

5.2.9 Bagging of Archival Core

If bagging of the archival split is deemed necessary by the SOC, it will be sealed in polyethylene lay-flat tubing as soon as it has been marked and labeled. Lengths of lay-flat tubing will be cut for each core interval. One end of each length will be sealed with a heat sealer. One side of the tubing will be marked with the top and bottom depths of the core interval near the ends. Orientation marks, red on the right and blue on the left (Figure 4), will be drawn on the plastic bag. The approximately 3-foot section of core will be laid slabbed side face up on a contoured polystyrene cradle. The core and polystyrene cradle will then be inserted into the premarked lay-flat tubing, the excess air will be squeezed out, and the end of the tubing will be heat sealed. The sealed section of core will be placed in a protective cardboard divider pad and positioned in the archival split box. This process will be repeated for the other row in the box.

5.2.10 Sealing of Boxes

After core processing, containers will be sealed with filament tape and prepared for storage.

5.3 Cuttings Processing

Following verification of samples at the SMF (BTP-SMF-003), cuttings will be washed (if necessary), divided into archival and research splits, packaged, and stored.

5.3.1 Facilities

The cuttings processing room will be equipped with electrical service, compressed air, running water, and drain lines with sediment traps.

5.3.2 Equipment

Cuttings processing equipment will include, but is not limited to:

Wemas automatic drill cuttings washer/dryer	Storage boxes
Work table equipped with casters	Storage vials
Riffle type sample splitter	Pneumatic stapler
Digital platform scale	

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5.3.3 Processing

A Cuttings Processing Log (Figure 11) will be used to document the various steps in processing the cuttings samples. The log contains the batch ID, borehole ID, container ID and interval, sample ID and interval of each bag, and a checklist delineating each stage of processing (i.e., wash/dry, split).

5.3.3.1 Washing and Drying

If the cuttings were produced by drilling with air, the samples will not be washed. If the cuttings were produced by drilling with drilling muds or air/foam, the samples will be washed.

5.3.3.2 Splitting

5.3.3.2.1 An archival split shall be taken from each cuttings sample received at the SMF. Cuttings will be split using a riffle-type sample splitter. The amount of sample taken for the archival split shall be up to 50 percent of the entire cuttings sample, not to exceed 50 grams. The archival cuttings sample will then be placed into a prelabeled plastic vial with screw caps. Each vial will have a label affixed denoting borehole ID, sample interval, and ACT bar code number of that sample. The plastic vial will be kept in a storage box containing other archival cuttings samples within the storage box sample range.

5.3.3.2.2 The research cuttings sample split, which will not exceed 200 grams, will be kept in plastic vials with screw caps. Each vial will have a label affixed denoting borehole ID, sample interval, and RCT bar code number of that sample. Principal Investigators requiring amounts of cuttings greater than 200 grams shall collect them at the borehole site and then submit a Sample Collection Report (BTP-SMF-007) to the SMF. SM Geotechnicians can also collect the cuttings for the investigator and document this on a Sample Collection Report.

5.3.3.3 Packaging and Labeling

Vials containing the research and archival splits of cuttings will be stored in separate boxes. The borehole ID, container interval, RCT or ACT bar code number (if applicable), and missing footage within that container (if applicable) will be entered into CSITS. Four permanent label types will be generated using information contained in CSITS with the aforementioned information contained on them: an Archival Sample vial label (Figure 7), a Research Sample vial label (Figure 8), an Archival Sample storage box label (Figure 9), and a Research Sample storage box label (Figure 10). Boxes will be sealed with filament tape.

5.4 Sample Storage

A Sample Container Storage Log (Figure 12) is generated using information contained in CSITS and includes the borehole ID, sample type, and RCT or ACT bar code

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number. The SMF Geotechnician placing the sample container in storage will enter the storage location and the date the container was shelved into the Sample Container Storage Log. The SMF Geotechnician and the TS Assistant shall both sign and date this record. The storage location of each container will be entered into CSITS. The storage areas shall be access-limited.

5.4.1 Core Sample Storage

The 1/3 and 2/3 diameter splits of the processed core, as well as the small bore core, will be shelved separately by acquisition site and location ID system. The 1/3 diameter archival split will be stored in the Archival Core Storage area of Building 4221, while the 2/3 diameter research split and the small bore core will be stored in Building 4320.

5.4.2 Cuttings Storage

Both the archival and research cuttings sample splits will be stored in the bulk sample storage area in Building 4320.

5.5 Identification and Resolution of Discrepancies

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 by crossing through the error, correcting it in the original document, and initialing and dating 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 record that fully describes the correction performed. Discrepancies discovered after an activity or form has been completed will be handled according to the procedure outlined in BTP-SMF-001, Section 5.7.4.

5.6 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 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.

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6.0 REFERENCES

BTP-SMF-001, Sample Management for the Yucca Mountain Project.

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

BTP-SMF-005, Examination of Samples by Participants at the SMF.

BTP-SMF-006, Removal of Whole Core and Other Specimens from Samples for Shipment and Remnant Return.

BTP-SMF-007, Acceptance for Curation by the SMF of Selected Samples and Documentation.

BTP-SMF-008, Field Logging and Documentation of Borehole Samples.

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

7.0 FIGURES

Figure 1 - Example of CSITS-generated Core Slabbing/Boxing Checklist.

Figure 2 - Example of CSITS-generated Core Box Label for Research Split.

Figure 3 - Example of CSITS-generated Core Box Label for Archival Split.

Figure 4 - Example of Core Markings.

Figure 5 - SMF Core Photography Log.

Figure 6 - Core Photographic Format.

Figure 7 - Example of CSITS-generated Vial Label for Cuttings Archival Sample.

Figure 8 - Example of CSITS-generated Vial Label for Cuttings Research Sample.

Figure 9 - Example of CSITS-generated Archive Cuttings Container Label.

Figure 10 - Example of CSITS-generated Research Cuttings Container Label.

Figure 11 - Example of CSITS-generated Cuttings Processing Log.

Figure 12 - Sample Container Storage Log.

8.0 QA RECORDS

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

1. Core Slabbing/Boxing Checklist.
2. SMF Core Photography Log.
3. Cuttings Processing Log.
4. Sample Container Storage Log.
5. Core Photographs.

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CORE SLABBING/BOXING CHECKLIST

Batch: RAT : BAT43 Borehole: SCORE : BHL141

<p>Container: _____</p> <p>Specifier: FCT100003</p> <p>Top Depth: 60.0</p> <p>Bot Depth: 75.0</p>	<p>Sample Status</p> <p>50.0 to 60.0 : REC</p> <p>60.0 to 62.5 : WCR</p> <p>62.5 to 75.0 : REC</p>
---	--

Remarks: _____

<p>CORE SLABBING CHECKLIST</p> <p>Labels Affixed to Boxes? _____</p> <p>Duplicate Orientation Marks Drawn? _____</p> <p>Depth Markers Extended Around Core? _____</p> <p>Duplicate Footage Markers Drawn? _____</p> <p>Rubble Spill and Bagged? _____</p> <p>Missing Footage Markers Inserted? _____</p> <p>Whole Core Removed Markers Inserted? _____</p> <p>Core Slabbed? _____</p>	<p>CORE BOXING CHECKLIST</p> <p>Tubing Marked with Depth and Orientation? _____</p> <p>Core Placed in Polystyrene Cradle? _____</p> <p>Cardboard Liner in Place? _____</p> <p>Working Core Placed in Lury-Bar Tubing? _____</p>
--	--

<p>SMF Geotechnician _____</p>	<p>Date _____</p>	<p>SMF Geotechnician _____</p>	<p>Date _____</p>
<p>TS Assistant _____</p>		<p>Date _____</p>	

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Figure 1. Example of CSITS-generated Core Slabbing/Boxing Checklist.

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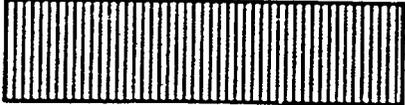
<p>YUCCA MOUNTAIN PROJECT RESEARCH CORE SAMPLES BOREHOLE: YMP-AC1 BHL10005 INTERVAL: 0.0 TO 46.0</p>  <p>RCT00000203</p>	<p>STATUS:</p> <p>0.0 to 40.0 : NAT 40.0 to 46.0 : REC</p>
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Figure 2. Example of CSITS-generated core box label for Research Split.

<p>YUCCA MOUNTAIN PROJECT ARCHIVE CORE SAMPLES BOREHOLE: YMP-AC1 BHL10005 INTERVAL: 0.0 TO 46.0</p>  <p>ACT00000203</p>	<p>STATUS:</p> <p>0.0 to 40.0 : NAT 40.0 to 46.0 : REC</p>
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Figure 3. Example of CSITS-generated core box label for Archival Split.

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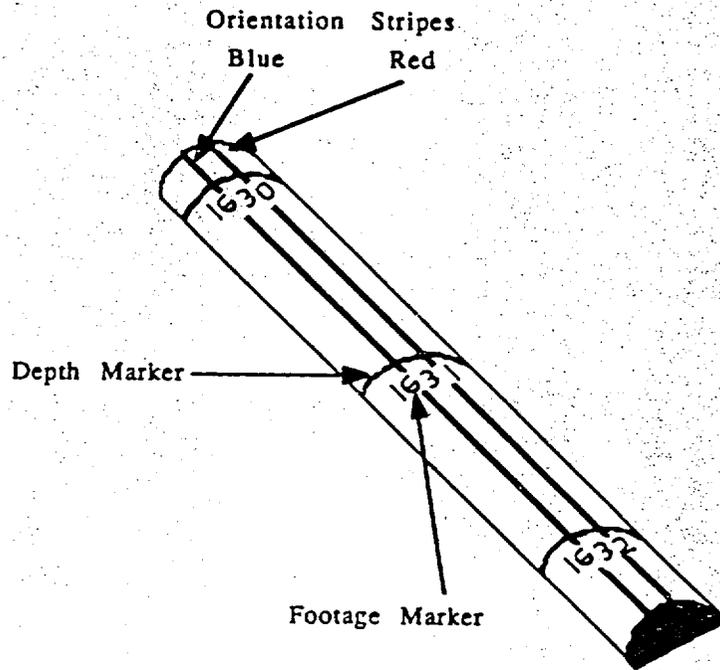
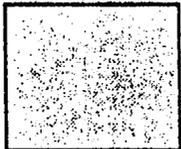
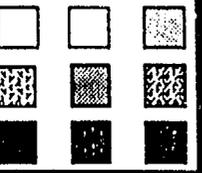
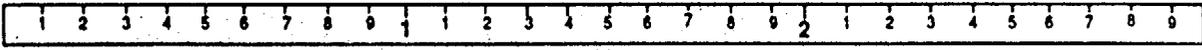


Figure 4. Example of Core Markings.

3163 00106

<p>Gray Scale</p> 	<p>Borehole ID _____</p> <p>RCT/ACT Bar Code # _____</p> <p>Depth _____ To _____</p> <p>Date Photographed _____</p>	<p>Missing Intervals</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>Color Scale</p> 
			
<p>CORE</p>		<p>CORE</p>	

BOTTOM

TOP

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Figure 6. Core Photographic Format.

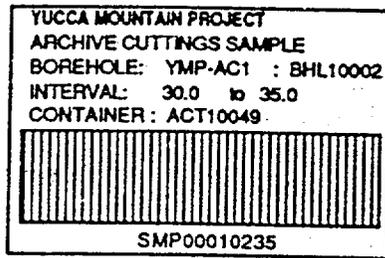


Figure 7. Example of CSITS-generated Vial Label for Cuttings Archival Sample.

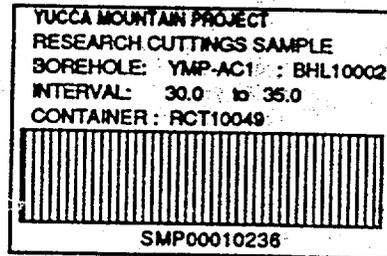


Figure 8. Example of CSITS-generated Vial Label for Research Sample.

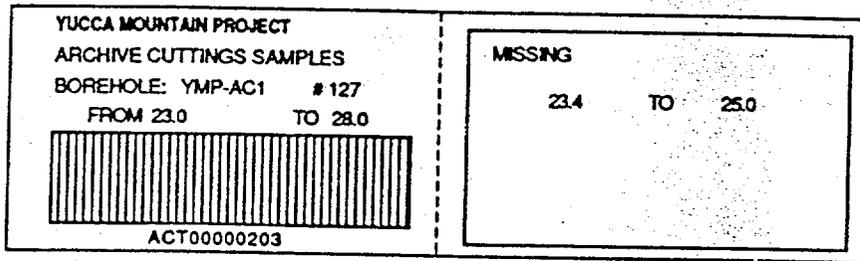


Figure 9. Example of CSITS-generated Archive Cuttings Container Label.

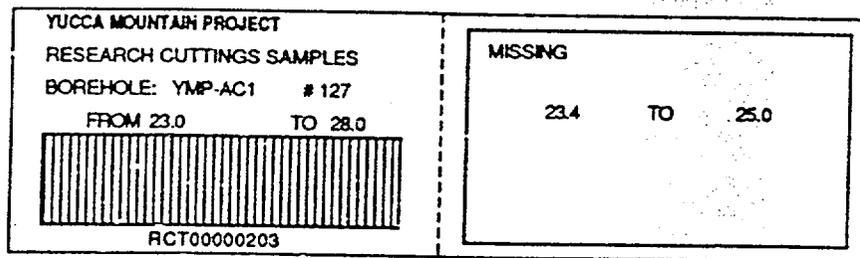


Figure 10. Example of CSITS-generated Research Cuttings Container Label.

CUTTINGS PROCESSING LOG

Batch: CUTPROC : BAT62 Borehole: YMP-AC2 : BHL143	Container Specifier: FCT0000319 Top: 238.7 Bot: 360.0	
Sample Specifier : SMP000000382 Top: 238.7 Bot: 300.0 Specifier : SMP000000383 Top: 300.0 Bot: 360.0	Wash/Dry _____ _____ _____	Split _____ _____ _____
	Packaged _____ _____ _____	Labeled _____ _____ _____
SMF Geotechnician _____ Date _____	TS Assistant _____ Date _____	

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Figure 11. Example of CSITS-generated Cuttings Processing Log.

9 0 : 0 0 3 0 1 4

PROCEDURAL INCONSISTENCIES WITH CORE SAMPLE HANDLING PROCEDURES

- o AP-6.2Q, BTP-SMF-001, BTP-SMF-007 and BTP-SMF-010 still identify the Sample Management organization as part of the Technical and Management Support Services organization, rather than as part of the Yucca Mountain Site Characterization Project Office.
- o AP-6.6Q describes the Exploratory Studies Facility as having vertical access shafts excavated by drill and blast methods, rather than ramps excavated by tunnel boring machines.
- o AP-6.2Q does not require USGS personnel to be present during drilling and core sample processing operations, although the USGS is still responsible for establishing requirements for the processes and developing the final core log.
- o AP-6.2Q, Section 5.5 calls for the core to be photographed after the core staging process is complete. The NRC staff suggested that the core be photographed immediately after the inner core barrel containing the core is opened in the May 8, 1990 letter. BTP-SMF-008 requires videotaping core before taking samples.
- o Although AP-6.2Q, Section 5.5 references BTP-SMF-008 and requires compliance with such, the two procedures are internally inconsistent with regard to core handling procedures.
- o BTP-SMF-010 references BTP-SMF-004, which Shelor's letter to Linehan dated March 25, 1991, says was incorporated into BTP-SMF-002.

Enclosure 2

Response to Procedural Inconsistencies

Comment #1 - Identification of sample management organization as part of Technical and Management Support Services (T&MSS) rather than Yucca Mountain Project Office.

Response: The Drilling Support and Sample Management Department of T&MSS provides support to the Yucca Mountain Project Office in the area of sample management. All related quality affecting activities are performed and controlled under the Office of Civilian Radioactive Waste Management (OCRWM) Quality Assurance Program.

Comment #2 - AP-6.6Q describes Exploratory Studies Facility (ESF) vertical access shafts excavated by drill and blast methods rather than excavated ramps through use of tunnel boring machines (TBMs).

Response: AP-6.6Q is in the process of being reviewed for cancellation. Changes will be made to all procedures, as necessary, to reflect the current plans for ESF ramp excavation by TBMs.

Comment #3 - USGS personnel are not required to be present during drilling and sampling operations, although they are responsible for establishing requirements for processes and developing the final core log.

Response: Job Packages, as described in AP-5.21Q, "Field Work Activation," are now the mechanism for defining USGS and other Participant responsibilities with regard to personnel on site during drilling and core sampling processing operations. Special sample handling requirements are incorporated into appropriate sampling procedures or sampling instructions prior to the start of work. Special sampling instructions (e.g., sampling requests from a particular interval) are identified in sample requests presented to the Sample Overview Committee (SOC) (AP-6.4Q). Approval of the requests may result in development of instructions for sampling, special handling, or packaging. The Drilling Support and Sample Management Department of T&MSS is responsible for core sampling and processing operations which are performed under approved procedures. They are also responsible for development of a preliminary field composite borehole log. Development of the final core log is a USGS responsibility.

Response to Procedural Inconsistencies
(continued)

Comment #4 - AP-6.2Q and BTP-SMF-008 are inconsistent as to when core is photographed. NRC suggests that core be photographed immediately after the inner core barrel has been opened.

Response: Agree. BTP-SMF-008 has been revised to reflect this comment. Cancellation of AP-6.2Q was approved by the Yucca Mountain Project Office on March 19, 1992, after a determination was made that all requirements contained in AP-6.2Q were satisfied in other existing procedures.

Comment #5 - Procedures AP-6.2Q and BTP-SMF-008 are internally inconsistent with regard to core handling.

Response: Agree. Disconnects between AP-6.2Q and BTP-SMF-008 were also noted by the Project Office during several informal reviews. As a result, AP-6.2Q was canceled (see Comment #4 response), and BTP-SMF-008 is now the primary core handling procedure used.

Comment #6 - BTP-SMF-010 references a nonexistent procedure (BTP-SMF-004).

Response: BTP-SMF-010, Gamma-Ray Logging of Yucca Mountain Project Core, has never been implemented with regard to quality affecting activities as part of site characterization. The procedure, however, is currently being revised to reflect T&MSS organizational changes and cancellation of BTP-SMF-004.

Enclosure 3

Core Sample Handling Procedures

<u>Document ID</u>	<u>Document Title and Status</u>	<u>Effective Date</u>
BTP-SMF-002, Rev.2	Transport, Receipt, Admittance, and Processing of Borehole Samples for SMF <u>Status:</u> Minor revisions to procedure were submitted in February for review and approval. Revisions reflect changes in T&MSS organization and interface documents.	08/19/91
BTP-SMF-005, Rev.2	Examination of Samples by Participants at the Sample Management Facility <u>Status:</u> Minor revisions to procedure were submitted in February for review and approval. Revisions reflect changes in T&MSS organization and interface documents.	06/18/91
BTP-SMF-006, Rev.2	Removal of Whole and Other Specimens from Samples by the SMF for Shipment and Remnant Return <u>Status:</u> Minor revisions to procedure were submitted in February for review and approval. Revisions reflect changes in T&MSS organization and interface documents.	03/14/91
BTP-SMF-007, Rev.0, ICN 2	Acceptance for Curation by the Sample Management Facility of Selected Samples and Documentation <u>Status:</u> Procedure is expected to be submitted in March for a cancellation review. AP-6.3Q contains the requirements set forth in this procedure regarding sample submissions and acceptance.	07/01/91

Core Sample Handling Procedures
(continued)

<u>Document ID</u>	<u>Document Title and Status</u>	<u>Effective Date</u>
BTP-SMF-008, Rev.2, ICN 1	Field Logging, Handling, and Documenting Borehole Samples <u>Status:</u> Minor revisions to procedure were submitted in February for review and approval. Revisions reflect changes in T&MSS organization and will aid in ease of implementation.	02/05/92
BTP-SMF-010, Rev.0	Gamma-Ray Logging of Yucca Mountain Project Core <u>Status:</u> Minor revisions to procedure were submitted in March for review and approval. Revisions reflect changes in T&MSS organization and will delete reference to nonexistent procedure.	03/14/92
BTP-SMF-013, Rev.0, ICN 2	Staging, Packaging, and Documenting Neutron-Access Borehole Samples <u>Status:</u> Minor revisions to procedure were submitted in February for review and approval. Revisions reflect changes in T&MSS organization.	01/13/92
AP-6.2Q	Management and Operation of Sample Handling Activities at Borehole Sites <u>Status:</u> Approved for cancellation on 03/19/92.	
AP-6.3Q, Rev.0, ICN 2	Interaction of Participants and Outside Interests with Yucca Mountain Project Sample Management <u>Status:</u> Procedure is currently being revised to reflect changes in T&MSS organization and to modify documentation of access to and control of Yucca Mountain geologic samples and specimens. Information from the current revision of the procedure will be extracted and used to create a new procedure to cover requirements for documentation of non-borehole samples (ex., trench samples).	03/11/92

Core Sample Handling Procedures
(continued)

<u>Document ID</u>	<u>Document Title and Status</u>	<u>Effective Date</u>
AP-6.4Q, Rev. 1	Procedure for the Submittal, Review, and Approval of Requests for Yucca Mountain Project Specimens <u>Status</u> : Procedure is currently being revised to update the forms and include additional requirements on core traceability. It will also reflect T&MSS organizational changes.	03/11/92
AP-6.6Q, Rev.0, ICN 1	Field Collection, Documentation, and Specimen Removal of Exploratory Shaft and Drift Rock <u>Status</u> : Submitted in February for cancellation review.	04/24/90

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

Title BRANCH TECHNICAL PROCEDURE: TRANSPORT, RECEIPT, ADMITTANCE, AND PROCESSING OF BOREHOLE SAMPLES FOR THE SMF	NO. BTP-SMF-002 <input checked="" type="checkbox"/> Q <input type="checkbox"/> Non Q
--	--

APPROVAL

T&MSS Assistant PROJECT MANAGER: Original signed by	John E. Shaler	6/28/89
	Signature	Date
DIRECTOR OF QUALITY ASSURANCE:	Edwin L. Wilmot	6/28/89
	Signature	Date
YMP Branch Chief (OTHER, AS REQUIRED)	D. E. Livingston for M. B. Blanchard	6/28/89
	Signature	Date

REVISION 0 EFFECTIVE DATE: 7/7/89

REVISIONS

		INITIAL AND DATE			
	REVISION 1	REVISION 2	REVISION 3	REVISION 4	
PROJECT MANAGER:	E. L. Wilmot	<i>[Signature]</i> 8/6/91			
	10/26/90				
DIRECTOR, QA:	D. G. Horton	<i>[Signature]</i>			
	10/26/90				
YMP Branch Chief	Uel S. Clanton	<i>[Signature]</i>			
(OTHER, AS REQUIRED)	M. B. Blanchard	<i>[Signature]</i>			
	10/26/90				
EFFECTIVE DATE:	10/26/90	Complete Revision			

8/19/91



TRAINING REQUIRED YES N/A

NUMBER OF DAYS REQUIRED FOR TRAINING 9

COMMENTS:

*SELF-STUDY FOR
Branch Chief Personnel*

[Signature]
 TRAINING OFFICER/TRAINING MANAGER 8/7/91
 DATE

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YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-002
TRANSPORT, RECEIPT, ADMITTANCE, AND PROCESSING OF
BOREHOLE SAMPLES FOR THE SMF

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1.0 PURPOSE AND SCOPE

1.1 PURPOSE

The purpose of this procedure is to facilitate the transport, handling, tracking, and documentation of borehole samples after their shipment from the drillsite and their subsequent arrival at the Sample Management Facility (SMF). The goals are to maintain the traceability and identity of all borehole samples and their containers admitted to the SMF from the field.

1.2 SCOPE

The scope of this procedure includes (1) instructions for loading and transporting borehole samples from the field; (2) instructions for receiving and admitting borehole samples from the field; (3) instructions for confirming the condition of and documentation associated with borehole samples and containers received at the SMF; (4) instructions for processing and storing borehole samples and containers; (5) responsibilities of SMF staff during the receipt, admission, confirmation, processing, and storage of borehole samples; and (6) the documentation of these activities.

2.0 APPLICABILITY

This procedure applies to all Field Test Control Department personnel; specifically, to all SMF and Field Operations (FO) personnel involved with the transport, receipt, processing, curation, and documentation of samples collected from Yucca Mountain Site Characterization Project (YMP) boreholes. The procedure also applies to any borehole samples collected under the Yucca Mountain Site Characterization Project Office (YMPO) Branch Technical Procedure BTP-SMF-008, "Field Logging, Handling, and Documenting Borehole Samples," and submitted to the SMF for curation.

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 taken as a sample of the interval penetrated by a core bit and brought to the surface for examination and/or analysis.

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3.2 CUTTINGS

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

3.3 INFORMATION BLOCK

An information block is an object placed in a sample container. The block represents a depth interval and provides information pertaining to the status of that interval.

3.4 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.

3.5 SAMPLE

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

3.6 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.

3.7 SAMPLE TYPE

Sample type designates the type of material that makes up a sample, i.e., core and cuttings.

3.8 SPECIMEN

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

3.9 UNIQUE IDENTIFIER

A unique identifier (ID) is a designation that sets a documentable object or event apart from similar entities. It may be an assigned number, a name, an alphanumeric designation, or a set of data items that collectively serve to specify an entity. Examples of unique identifiers used in this procedure include Borehole ID, Container ID, Sample ID, or Specimen ID.

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TRANSPORT, RECEIPT, ADMITTANCE, AND PROCESSING OF
BOREHOLE SAMPLES FOR THE SMF

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4.0 RESPONSIBLE PARTIES

The following YMP individuals are responsible for activities identified in Section 5.0 of this procedure:

1. SMF Curator
2. FO/SMF Courier
3. SMF Staff
4. SMF Geotechnician
5. FO Staff
6. SMF Technical Staff Assistant (TSA)
7. SMF/FO Administrative Assistant (AA)

5.0 PROCEDURE

NOTE: A flowchart of the following processes described in this procedure is attached as Figure 1.

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
FO Staff	1.	Before shipping a group of borehole sample containers (containers) from the drillsite to the SMF, prepare a Field Container Summary and Transmittal Document (Transmittal Document). The Transmittal Document shall contain the following information: <ol style="list-style-type: none">a. Borehole IDb. Number of containers included in the shipmentc. Date of the shipmentd. A list of the containers included in the shipment, containing the following information for each:<ol style="list-style-type: none">i. Container ID

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
FO Staff		<ul style="list-style-type: none">ii. Sample type (core, cuttings, or other sample)iii. Sequential container number with respect to other containers from the same borehole of the same sample typeiv. Depth intervale. For each container, a list of all included depth intervals, and their existence codes
		<p>NOTE: Existence codes may include the following:</p> <ul style="list-style-type: none">i. REC - A sample recovered from the borehole and included within the containerii. UNREC - An interval for which no samples were successfully recoverediii. NAT - A drilled interval during which no sample recovery was attemptediv. WCR - A field specimen removed from core before the boxing of the container interval, in accordance with BTP-SMF-008v. LOST - A sample that was recovered, but is unaccounted for during container loadingvi. DEST - A sample accidentally destroyed before loading into its container
		<ul style="list-style-type: none">f. A description of the documentation supplied with the sample shipment.

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
FO Staff		<p>NOTE: The cumulative sample shipments for each borehole shall have included the following:</p> <ol style="list-style-type: none">i. Field Specimen Removal Checklist and Contract (Specimen Contract)ii. Shift Drilling Summaryiii. Lithologic Logsiv. Structural Logsv. Daily Activities Logvi. Field Photographic Logvii. Field Facility Access Logviii. Core videotape
FO/SMF Courier	2.	Prepare a vehicle for transport of borehole samples from the field to the SMF. Lay a sufficient thickness of foam rubber dunnage on the floor of the transport vehicle to protect containers from mechanical shock during transport.
	3.	Load containers into the transport vehicle. Ensure that the containers are adequately secured against displacement, and that sufficient padding exists between rows and layers of containers to minimize the transmission of road shocks to the samples inside.
	4.	Inventory containers and documents being loaded onto the transport vehicle and check them against the Transmittal Document. When the data agree with the contents of the vehicle, sign the "Person Accepting Custody" field, and place the date and time of the transfer in the spaces provided.

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
FO Staff	5.	Inventory containers and documents being loaded onto the transport vehicle and check them against the Transmittal Document. Mark the "Shipped OK" space for each container properly loaded.
	6.	When the data on the Transmittal Document agree with the contents of the vehicle, sign the "Person Releasing Custody" field, and place the date and time of the transfer in the spaces provided.
FO/SMF Courier	7.	Transport containers from the drillsite to the SMF.
	8.	Unload containers and documentation from the transport vehicle and place them in an available receiving area.
SMF Geotechnician	9.	Inventory containers and documents being unloaded from the transport vehicle and check them against the Transmittal Document. Mark the "Received OK" space for each container properly unloaded.
	10.	When the data on the Transmittal Document agree with the contents of the vehicle, sign the "Person Accepting Custody" field and place the date and time of the transfer in the space provided.
FO/SMF Courier	11.	Inventory containers and documents being unloaded from the transport vehicle and check them against the Transmittal Document.
	12.	When the data on the Transmittal Document agree with the contents of the vehicle, sign the "Person Releasing Custody" field and place the date and time of the transfer in the spaces provided.

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
	ADMITTANCE	
SMF Curator	13.	Assign a group of one or more available containers to undergo the admittance portion of this procedure.
	NOTE:	The containers to be admitted at a particular time will be determined by the scheduling needs of the SMF, and by the needs of YMP participants.
SMF Staff	14.	Arrange containers in a working area in preparation for admittance.
	15.	Open the lids of the containers and inspect the contents for signs of damage or disruption of samples that may have been sustained during transport.
	16.	Prepare a Confirmation Checklist using data from the Transmittal Document and the Specimen Contract, containing as a minimum the following items: <ul style="list-style-type: none">a. A list of containers included in the assignment with the following data for each:<ul style="list-style-type: none">i. Container IDii. Borehole IDiii. Sequential container numberiv. Sample type (core, cuttings, or other sample)v. Depth intervalb. For each container, a list of all included sample intervals, and their existence codesc. Date the Confirmation Checklist was prepared

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff		<ul style="list-style-type: none">d. For each interval, spaces for notations, corrections, and comments regarding status of samples, and a verification line for the SMF Geotechnician to initial after confirmation of sample datae. Signature lines for the SMF Geotechnician and the TSA to document the completion of the Confirmation Checklistf. A page marker indicating the total number of pages in the Confirmation Checklist, and the sequence of the individual page
SMF Geotechnician	17.	<p>Compare the information contained in the Confirmation Checklist with the contents of the containers. Check for the following conditions:</p> <ul style="list-style-type: none">a. Container IDs should match those on container labels.b. Existence codes should match the samples or information blocks within the indicated container.c. All core field specimens documented on information blocks in the containers should have been recorded on the Specimen Contract.d. All depths marked on samples should be consistent with those recorded on the container labels and with intervals given on the Confirmation Checklist.
	18.	<p>Initial each sample interval in the space provided when the information on the Confirmation Checklist is confirmed or corrected.</p>

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Geotechnician	19.	Sign and date each page of the completed Confirmation Checklist in the spaces provided and submit it to the TSA.
	20.	Submit the Transmittal Document and the Specimen Contract to the TSA.
	21.	Submit remaining documents received under step 1(f) to the AA.
TSA	22.	Verify that the Confirmation Checklist, Specimen Contract, and Transmittal Document are completely and correctly filled out. Sign and date each page in the spaces provided, and submit them to the AA.
SMF Staff	23.	If cuttings samples are to be processed, continue with the next step. Otherwise, proceed to step 35.

CUTTINGS PROCESSING

24. For each container to be processed, prepare a Cuttings Processing Checklist, providing as a minimum the following information:
 - a. Container ID
 - b. Borehole ID
 - c. Depth interval of the container
 - d. A list of existence codes for each depth interval within the container
 - e. A list of specific steps for processing cuttings, with space for checking the completion of each
 - f. A space for including any special processing instructions that might apply to a specific container

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff		<p>g. Signature and date spaces to document completion of the procedure by SMF Staff and the TSA</p> <p>h. Space for recording permanent storage location of container</p> <p>25. For each container, obtain an identical container to store the archive sample split. Use the original container to store the research split of the samples. For each archival and research container, affix five permanent labels or markings displaying the following information:</p> <ul style="list-style-type: none">a. Container IDb. Borehole IDc. Sequential cuttings container numberd. Type of sample, i.e., cuttingse. The cuttings split represented by the container, whether Research or Archivef. Depth interval <p>NOTE: Labels or marks must be placed on both ends of the container base and lid, and on one side of the container lid.</p> <p>26. If cuttings were drilled using an externally introduced fluid lubricant, wash and dry each cuttings sample. Otherwise, dry and disaggregate cuttings as necessary to ease subsequent splitting. Document this step by marking the space provided on the Cuttings Processing Checklist.</p>

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff	27.	<p>Split cuttings into archive and research portions. The amount of sample taken for the archival split may be up to 50 percent of the cuttings sample.</p> <ol style="list-style-type: none">a. Prepare a 6-ounce screw-capped plastic vial for the research split, and a 2-ounce screw-capped plastic vial for the archive split.b. Permanently label or mark on each vial the Borehole ID, Sample ID, sample interval, and Container ID for the sample.c. Before splitting, filter out excessively large particles using a 2mm x 2mm sieve. Divide larger particles into two equal splits.d. Split cuttings using a riffle-type sample splitter. Return particles filtered out previously to the sample splits.e. Place the archival split into a pre-labeled 2-ounce screw-capped plastic vial.f. Place the research split into a pre-labeled 6-ounce screw-capped plastic vial.g. Discard any remaining material after the archive and research sample vials have been filled.h. Document the splitting of cuttings samples by marking the space provided on the Cuttings Processing Checklist.
	28.	<p>Place vials containing archival and research splits into the containers as illustrated in Figure 2. Document on the Cuttings Processing Checklist by marking in the space provided.</p>

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff	29.	Close and seal the research and archive cuttings sample containers. Document by checking the space provided on the Cuttings Processing Checklist.
	30.	Assign a permanent shelf location for each of the archival and research cuttings sample containers. Store archival and research splits of cuttings sample containers in separate areas of the SMF.
	31.	Mark the Cuttings Processing Checklist on the spaces provided for location assignment of containers.
	32.	Check that information on the Cuttings Processing Checklist is complete and accurate. Sign and date in the spaces provided and submit it to the TSA.
TSA	33.	Verify that entries on the Cuttings Processing Checklist are complete and correct. Sign and date each page on the spaces provided and submit it to the AA.
SMF Staff	34.	Go to Step 49.
		CORE PROCESSING
SMF Staff	35.	For each container to be processed, prepare a Core Processing Checklist, providing as a minimum the following information: <ul style="list-style-type: none">a. Container IDb. Borehole IDc. Depth intervald. A list containing the depth interval and existence code of each sample within the container

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff		<ul style="list-style-type: none">e. A list of specific steps for processing core, with a space for checking the completion of eachf. Space for including any special processing instructions that might apply to a specific containerg. Signature and date spaces for the documentation of procedure completion by the SMF staff and the TSAh. Space for recording the permanent storage location assignment for the container
	36.	<p>Affix five permanent labels or markings for each box displaying the following information:</p> <ul style="list-style-type: none">a. Container IDb. Borehole IDc. Depth intervald. Sequential container numbere. Type of sample, i.e., core
		<p>NOTE: Labels or marks must be placed on both ends of the container base and lid, and on one side of the container lid.</p>
	37.	<p>Ensure that field markings on core are clear and unobscured; redraw as necessary using the process described in BTP-SMF-008. Document the completion of this step on the Core Processing Checklist.</p>

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff	38.	<p>Check to ensure that all rubble intervals are properly bagged and labeled. If bag is damaged or if labeling is unclear, rebag the rubble using the following method:</p> <ol style="list-style-type: none">a. Note the top and bottom depths assigned to the rubble interval.b. Cut a length of clear polyethylene lay flat tubing sufficient to include the length of the rubble interval plus enough overlap to facilitate complete sealing.c. Using a heat sealer, seal one end of the tubing. Designate the sealed end as the bottom depth of the interval, and mark the depth on it. With the bottom end of the tubing facing you, draw parallel red and blue stripes on the bag from top to bottom, with the red stripe on the right.d. Transfer rubble as a unit to the new bag, taking care to keep disturbance of the sample to a minimum. Ensure that the measured length of the sample corresponds to the assigned depth interval.e. Expel as much air as possible from the bag without disturbing the sample. Seal the top end of the bag with a heat sealer. Mark the top of the bag with the assigned top depth of the sample. Insert the bag into its proper position within the core container.
	39.	<p>Indicate by marking or labeling the inside of each container at the top and bottom of each row of core the corresponding depth assigned to the core at that point.</p>

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff	40.	Prepare a Core Photography Log containing spaces for the following entries: <ul style="list-style-type: none">a. Film exposure numberb. Container IDc. Depth interval of the containerd. Borehole IDe. Photographer's name and organizationf. Signature and date spaces for the SMF staff overseeing the photography and for the TSA
	41.	Photograph the core in its container to create a visual record of its condition, position in the box, and orientation. Document the process on the Core Photography Log. <ul style="list-style-type: none">a. Arrange the container and labeling cards as shown in Figure 3.b. Ensure all core markings, information blocks, and significant features are visible and in focus.c. If authorized by the SMF Curator, moisten the core with a distilled water spray to enhance the contrast of the core's colors and textures.d. After each exposure, recheck the focus and core placement to ensure correct arrangement and legibility.
	42.	Check that information on the SMF Core Photography Log is complete and accurate. Sign and date it in the spaces provided, and submit it to the TSA.

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
TSA	43.	Verify that the SMF Core Photography Log is completely and correctly filled out. Sign and date each page in the spaces provided, and submit it to the AA.
SMF Staff	44.	Close containers and seal with adhesive tape. Document by checking the space provided on the Core Processing Checklist.
	45.	Assign a permanent shelf location for each of the core sample containers.
	46.	Mark the Core Processing Checklist on the spaces provided for location assignment of containers.
	47.	Check that the information on the Core Processing Checklist is complete and accurate. Sign and date each page in the spaces provided and submit it to the TSA.
TSA	48.	Verify that entries on the Core Processing Checklist are complete and correct. Sign and date each page on the spaces provided, and submit the checklist to the AA.
AA	49.	Photocopy, compile, and submit records generated or received under this procedure in accordance with QMP-17-01, Records Management: Record Source Implementation.

IDENTIFICATION AND RESOLUTION OF DISCREPANCIES

SMF Staff	50.	Identify and resolve upon discovery any discrepancy resulting from the actions of staff members using this procedure by crossing through the error and correcting it on the original document, and initialing and dating the correction.
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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff		<p>a. If the correction is not self-explanatory, then assign a number to the correction and attach a sheet to the original record that fully describes the problem and the correction performed.</p> <p>b. If the discrepancy is discovered after an activity or a form has been completed, then handle according to the procedure outlined in BTP-SMF-001, Sample Management for the YMPO.</p> <p>51. Identify any nonconformances to this procedure and process according to QMP-15-01, Control of Nonconformances.</p>

6.0 REFERENCES

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

6.1 REQUIREMENTS DOCUMENTS

Project Office Quality Assurance Program Plan, YMP/88-9
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
BTP-SMF-001, Sample Management for the Yucca Mountain Site Characterization Project Office
BTP-SMF-008, Field Logging, Handling, and Documenting Borehole Samples
QMP-15-01, Control of Nonconformances
QMP-17-01, Records Management: Record Source Implementation

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7.0 FIGURES AND ATTACHMENTS

Figure 1, BTP-SMF-002 Flowchart

Figure 2, Arrangement of Split Cuttings Samples in Containers

Figure 3, Sample Container Arrangement for Photography

8.0 RECORDS

The following Quality Assurance documents are generated by this procedure:

1. Field Container Summary and Transmittal Document
2. Confirmation Checklist
3. Cuttings Processing Checklist
4. Core Processing Checklist
5. Core Photography Log .

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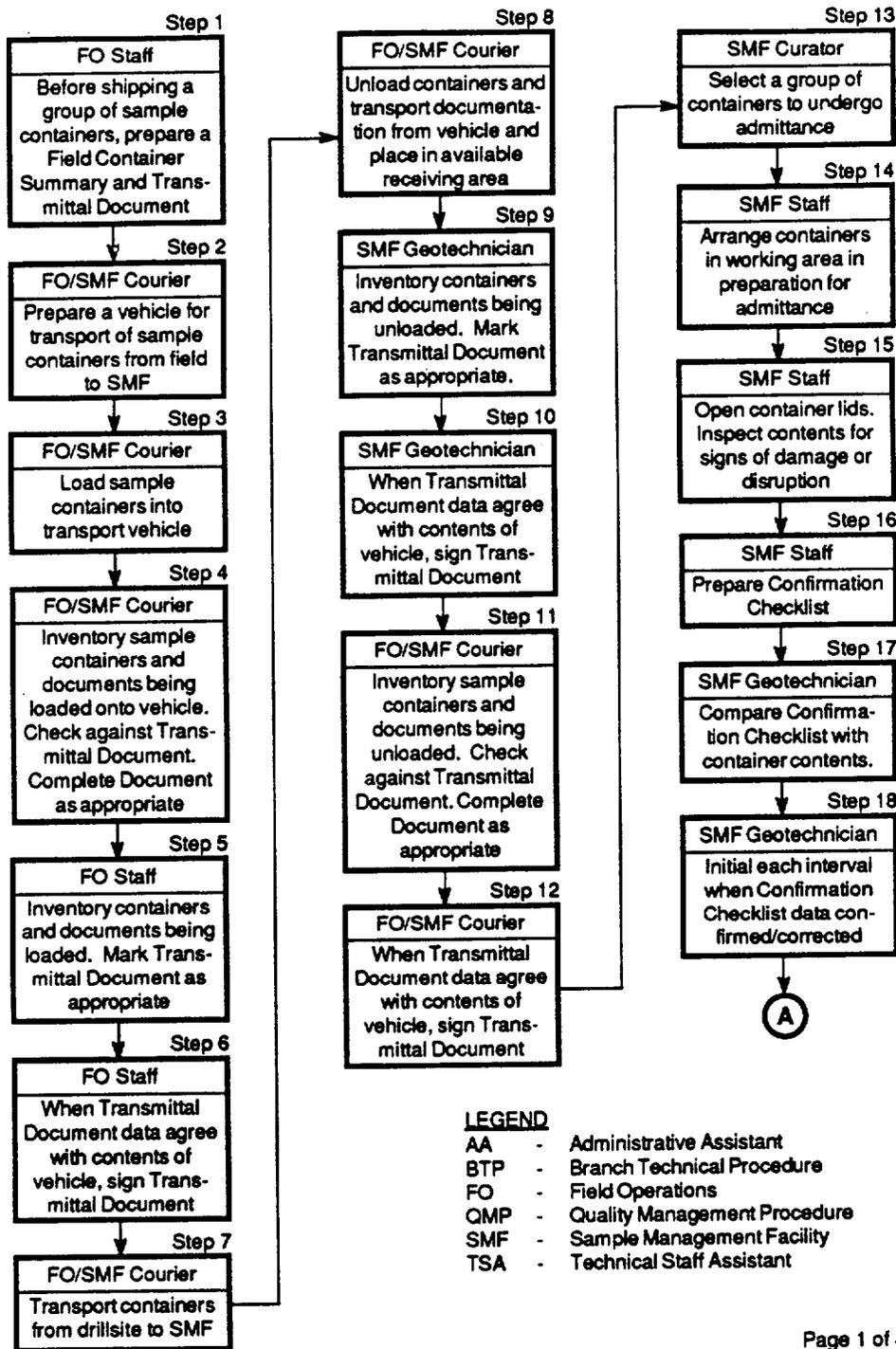


Figure 1 - BTP-SMF-002 Flowchart

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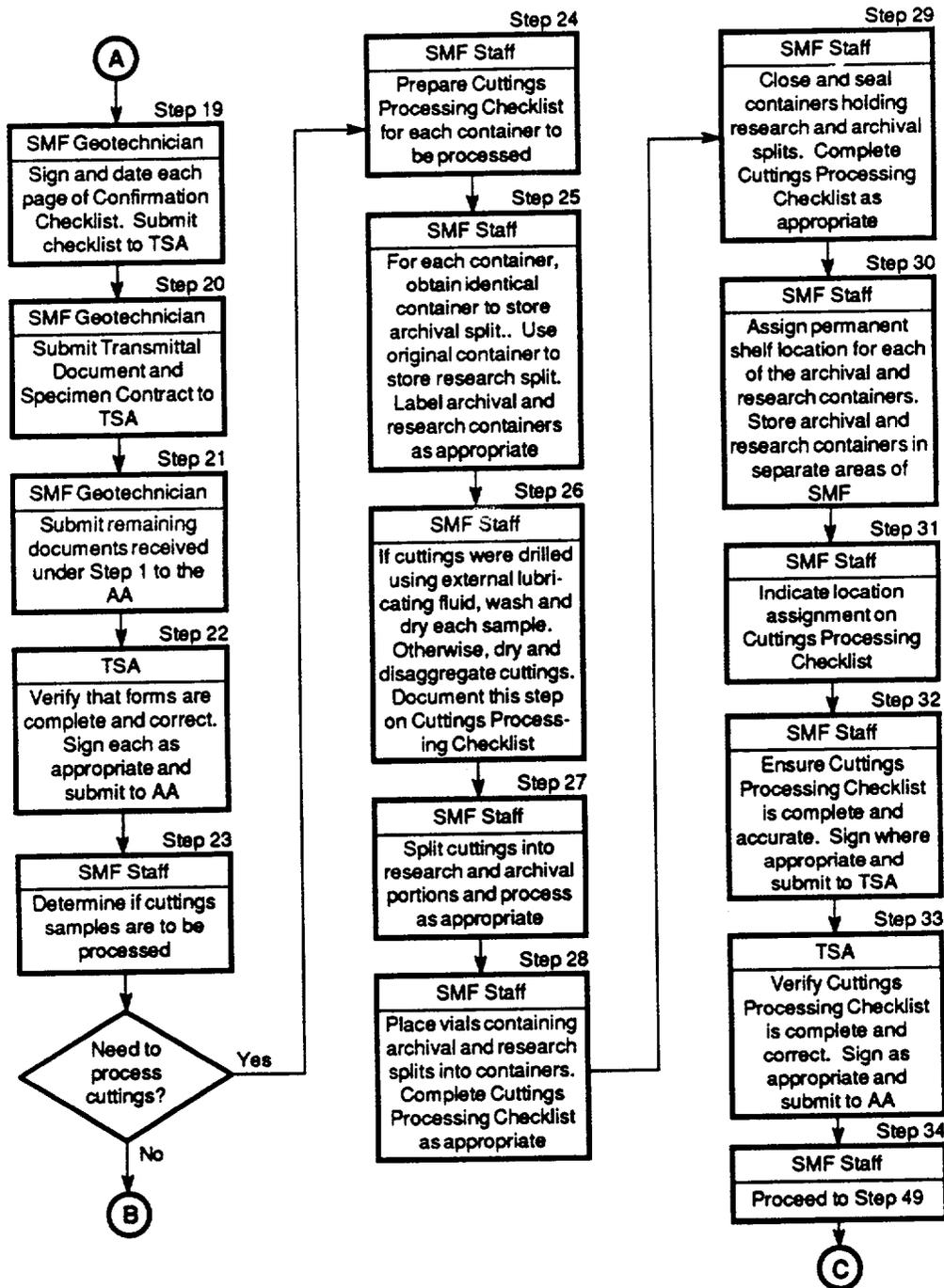


Figure 1 - BTP-SMF-002 Flowchart (continued)

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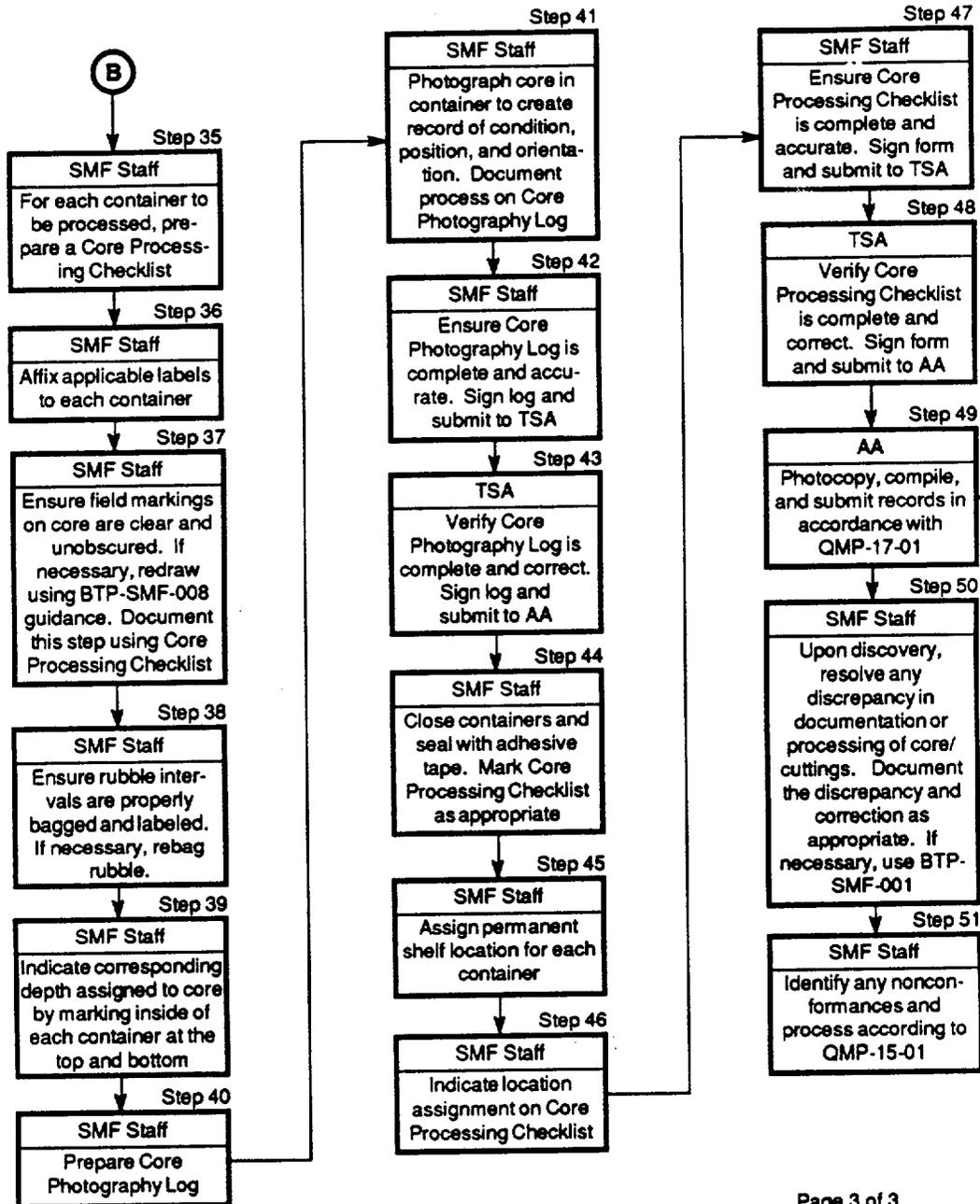


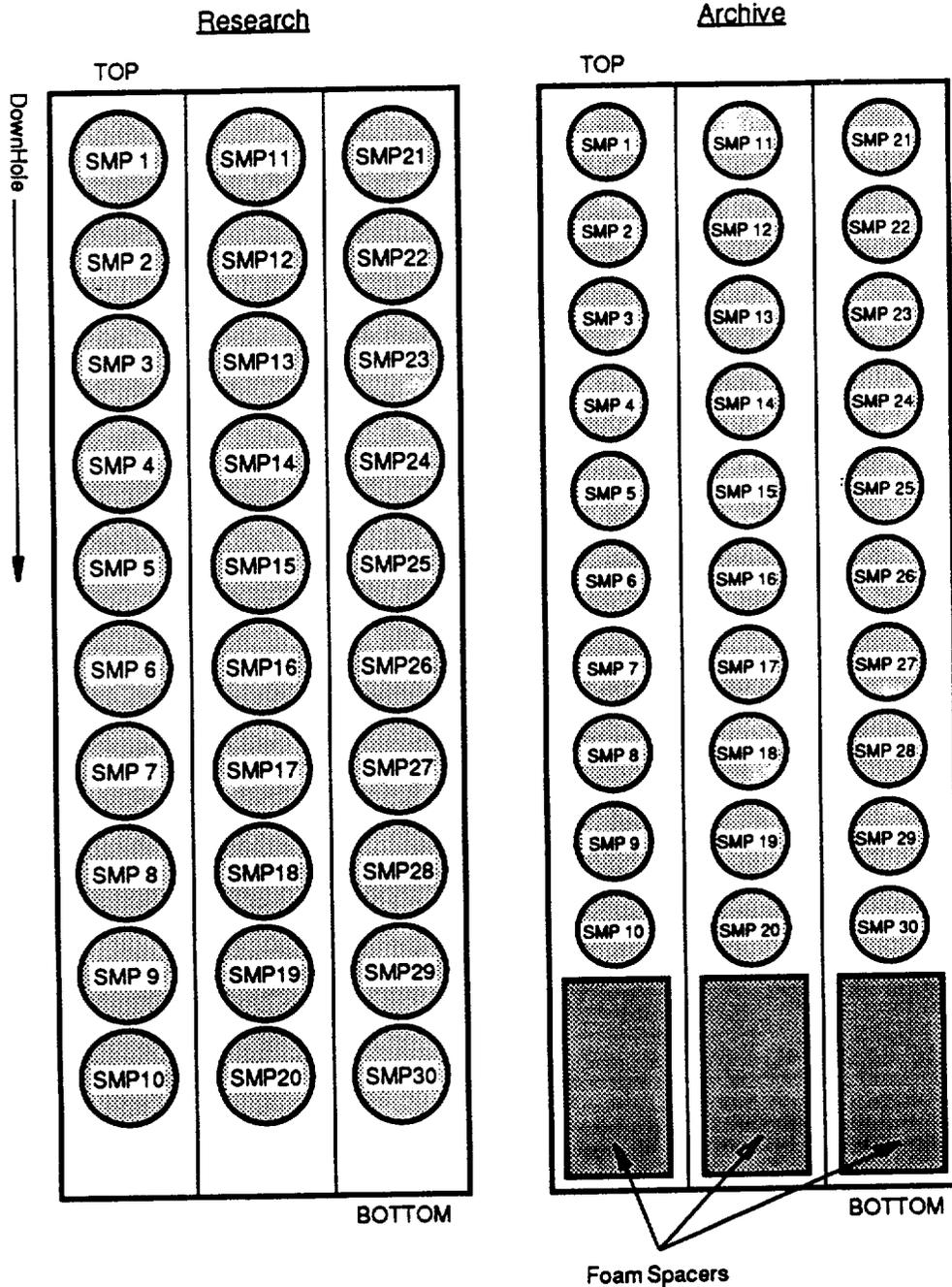
Figure 1 - BTP-SMF-002 Flowchart (continued)

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CUTTINGS.0657-15-91

Figure 2 - Arrangement of Split Cuttings Sample in Containers

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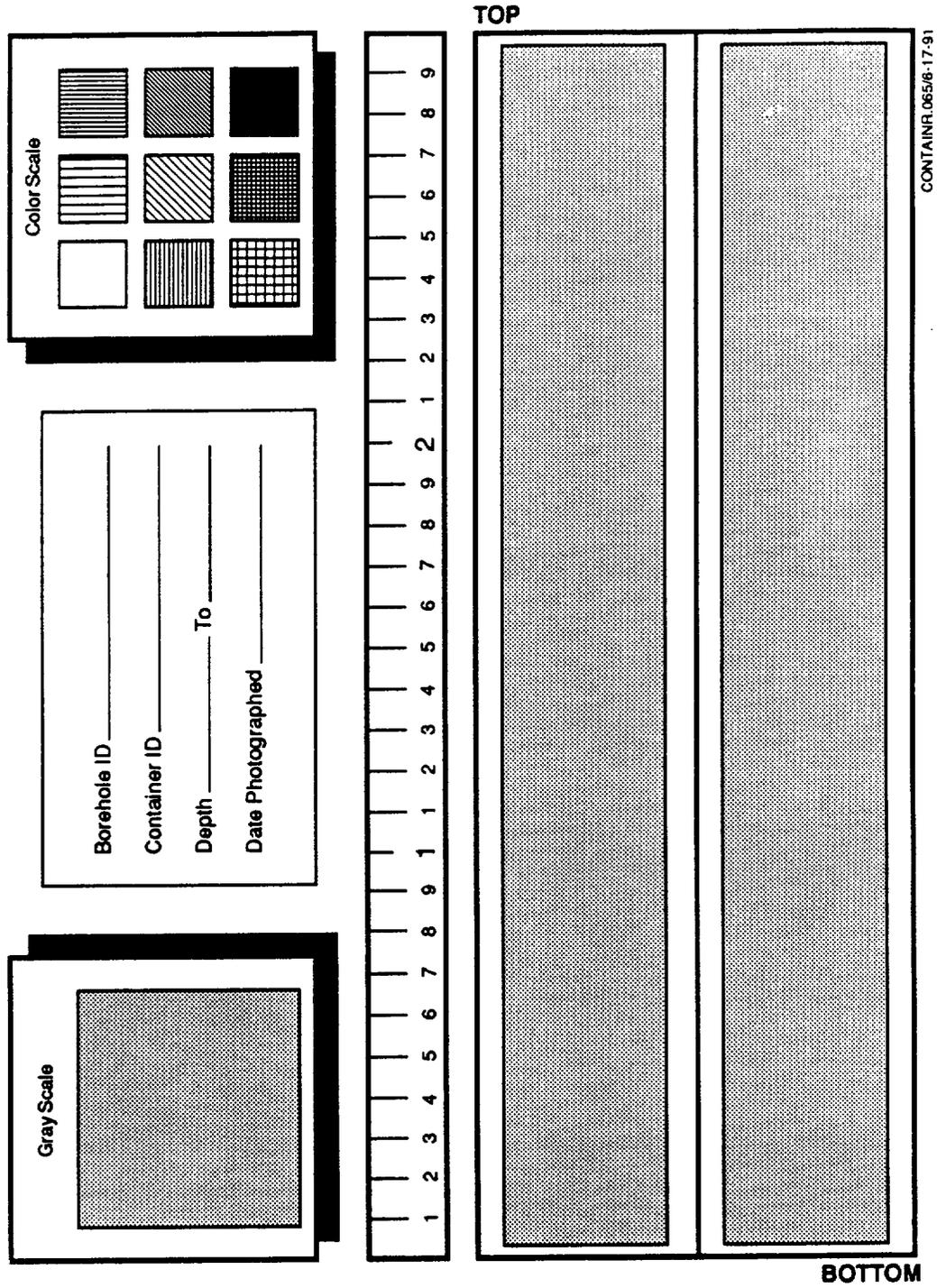


Figure 3 - Sample Container Arrangement for Photography.

**YUCCA MOUNTAIN PROJECT OFFICE
DOCUMENT APPROVAL SHEET**

Y-AD-002
1/22/91

Title BRANCH TECHNICAL PROCEDURE: EXAMINATION OF SAMPLES BY PARTICIPANTS AT THE SAMPLE MANAGEMENT FACILITY	NO. BTP-SMF-005 <input checked="" type="checkbox"/> Q <input type="checkbox"/> Non Q
--	--

APPROVAL

PROJECT MANAGER:	John E. Shaler (T&MSS APM)	6/28/89
	Signature	Date
DIRECTOR OF QUALITY ASSURANCE:	Edwin L. Wilmot	6/28/89
	Signature	Date
YMP Branch Chief (OTHER, AS REQUIRED)	D. E. Livingston for M. B. Blanchard	6/28/89
	Signature	Date

REVISION 0 EFFECTIVE DATE: 7/7/89

REVISIONS

	INITIAL AND DATE			
	REVISION 1	REVISION 2	REVISION 3	REVISION 4
PROJECT MANAGER: <u>E. Wilmot for C.P.G.</u> 10/26/90	<i>EW</i> 5/31/91			
DIRECTOR, QA: <u>D. G. Horton</u> 10/26/90	<i>DGH</i> 5/30/91			
YMP SIB Chief <u>U. S. Clanton</u> (OTHER, AS REQUIRED) <u>M. B. Blanchard</u> 10/26/90	<i>USC</i> 5/31/91			
EFFECTIVE DATE: <u>10/26/90</u>	<u>6/18/91</u>			

This document is a complete revision.



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TRAINING REQUIRED YES N/A NUMBER OF DAYS REQUIRED FOR TRAINING 10

COMMENTS: SELF-STUDY
FOR PERSONNEL
BASELINED FOR THIS
PROCEDURE

<i>W. McParthy</i>	6/4/91
TRAINING OFFICER/TRAINING MANAGER	DATE

4112020169 10pp

ENCLOSURE 5

YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001
8/90

Procedure No.: BTP-SMF-005
EXAMINATION OF SAMPLES BY PARTICIPANTS
AT THE SAMPLE MANAGEMENT FACILITY

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1.0 PURPOSE AND SCOPE

1.1 PURPOSE

The purpose of this procedure is to facilitate the tracking and use of geologic samples collected from Yucca Mountain Site Characterization Project (YMP) boreholes and curated at the Sample Management Facility (SMF). Its goals are to maintain the traceability and identity of all samples examined at the SMF by YMP Participants and other individuals and organizations.

1.2 SCOPE

The scope of this procedure includes (1) instructions for coordinating requests for examinations of samples by YMP Participants, (2) responsibilities of SMF Staff during sample examination activities, and (3) the documentation related to the examination and the disposition of those documents.

2.0 APPLICABILITY

This procedure applies to all SMF personnel involved with the preparation, documentation, or examination of borehole samples collected under YMP procedures and curated at the SMF. It also applies to any borehole samples collected under YMP procedures and curated at the SMF.

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 CUTTINGS

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

3.3 SAMPLE

A sample is part of a population whose properties are studied to gain information about the whole or the group.

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Y-AD-001
8/90

Procedure No.: BTP-SMF-005
EXAMINATION OF SAMPLES BY PARTICIPANTS
AT THE SAMPLE MANAGEMENT FACILITY

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3.4 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.

3.5 UNQUALIFIED SAMPLE

An unqualified sample is a sample not collected under the provisions of a YMP approved Quality Assurance Plan, and applicable approved implementing procedures. These samples are considered unqualified until they have been qualified under approved procedures.

3.6 REQUESTOR

The Requestor is an individual from a YMP Participant or outside interest who requests to visually examine a YMP sample.

3.7 EXAMINER

An Examiner is an individual from a YMP Participant or outside interest who is authorized to visually examine samples at the SMF.

4.0 RESPONSIBLE PARTIES

The following YMP individuals are responsible for activities identified in Section 5.0 of this procedure:

1. SMF Curator
2. SMF Staff
3. Technical Staff Assistant
4. SMF Geotechnician
5. Administrative Assistant

5.0 PROCEDURE

NOTE: A flowchart of the following processes described in this procedure is attached as Figure 1.

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Curator	1.	Receive a completed Sample Examination Request from a requestor in accordance with AP-6.3Q.
	2.	Schedule the sample examination according to the needs of the requestor and the projected availability of SMF facilities and staff. Submit approved Sample Examination Request to the Technical Staff Assistant.
Technical Staff Assistant	3.	Verify that the Sample Examination Request is completely and correctly filled out. Sign and date it in the spaces provided. Submit the completed record to the Administrative Assistant.
	4.	Prior to the arrival of the examiner at the SMF, direct the SMF staff to retrieve and lay out requested sample containers in an examination room.
SMF Staff	5.	Prepare a Sample Examination Record containing, as a minimum, the following information: <ul style="list-style-type: none"> a. The name, organization, phone, and address of the requestor b. The scheduled date of the examination c. A list of each sample container to be examined, including the borehole, depth interval, and container unique identifier d. For each sample container, spaces for the notation of the date of transfer to the examination room, the weight of the container prior to the examination, the date returned to the shelf, and the weight of the container after the examination

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff	e.	Signature and date spaces for the SMF staff and the Technical Staff Assistant
	6.	Remove designated sample containers from storage and transport them to the examination room. If directed by the curator, weigh selected containers. Unless directed otherwise by the curator, lay container sequentially on examination tables.
	7.	Record the date of the container transfer and, if applicable, the weight of the container in the spaces provided on the Sample Examination Record.
Administrative Assistant	8.	Using the Sample Examination Request, determine if the samples to be examined consist of unqualified core. <ul style="list-style-type: none"> a. If yes, go to Step 9. b. If no, go to Step 11.
	9.	Determine whether an Unqualified Sample Examination Agreement, completed in accordance with AP-6.3Q, is on file for the examiner. <ul style="list-style-type: none"> a. If yes, go to Step 11. b. If no, go to Step 10.
	10.	Have the examiner sign an Unqualified Sample Examination Agreement, and retain a copy in the examiner's file.
SMF Curator	11.	Supply the examiner with the access code for the exam room cipherlock.
SMF Staff	12.	Upon the completion of the sample examination, inspect sample containers to ensure that samples are undisturbed. Weigh any containers that were weighed

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff		prior to the examination. Return sample containers to their assigned shelf locations.
	13.	Record the date of the container return and, if applicable, the weight of the container in the spaces provided on the Sample Examination Record.
	14.	Determine that the information on the Sample Examination Record is complete and accurate. Sign and date on the spaces provided. Submit completed Sample Examination Record to the Technical Staff Assistant.
Technical Staff Assistant	15.	Verify that the Sample Examination Record is completely and correctly filled out. Sign and date it in the spaces provided. Submit the completed record to the Administrative Assistant.
Administrative Assistant	16.	Receive completed Sample Examination Request, Unqualified Samples Examination Agreement, if applicable, and Sample Examination Record. Photocopy, compile, and submit the records in accordance with QMP-17-01.

IDENTIFICATION AND RESOLUTION OF DISCREPANCIES

SMF Staff	17.	Identify and resolve any discrepancy upon discovery by crossing through the error, correcting it in the original document, and initialing and dating the correction. If the correction is not self-explanatory, then: a. Assign a number to the correction. b. Attach a sheet to the original record that fully describes the problem and the correction performed.
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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff		c. If the discrepancy is discovered after an activity or form has been completed, then handle according to the procedure outlined in Section 5.7 of BTP-SMF-001, Sample Management for the YMPO.
	NOTE:	Discrepancies covered by this procedure are only those that result from the actions of staff members using the procedure. A discrepancy exists when there is incorrect information that significantly affects documentation of notation and that is beyond the scope of the immediate activity of the form being completed.
	18.	If there are any nonconformances to this procedure noted during or after associated activities, proceed according to QMP-15-01, Control of Nonconformances.
	NOTE:	A nonconformance exists when there is a deficiency in characteristics, documentation, or procedures that renders the quality of an activity or an item unacceptable or indeterminant. The intent of nonconformance reporting is to ensure the resolution of the conditions not meeting the requirements or to ensure that undefined conditions are defined.

6.0 REFERENCES

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

6.1 REQUIREMENTS DOCUMENTS

None

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6.2 INTERFACE DOCUMENTS

Project Glossary, YMP/89-15

AP-6.3Q, Interaction of Participants and Outside Interests with Yucca Mountain Project Sample Management

QMP-15-01, Control of Nonconformances

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

BTP-SMF-001, Sample Management for the Yucca Mountain Site Characterization Project Office

7.0 FIGURES AND ATTACHMENTS

Figure 1, BTP-SMF-005 Flowchart

8.0 RECORDS

The following Quality Assurance documents are generated by this procedure:

1. Sample Examination Request
2. Unqualified Samples Examination Agreement
3. Sample Examination Record

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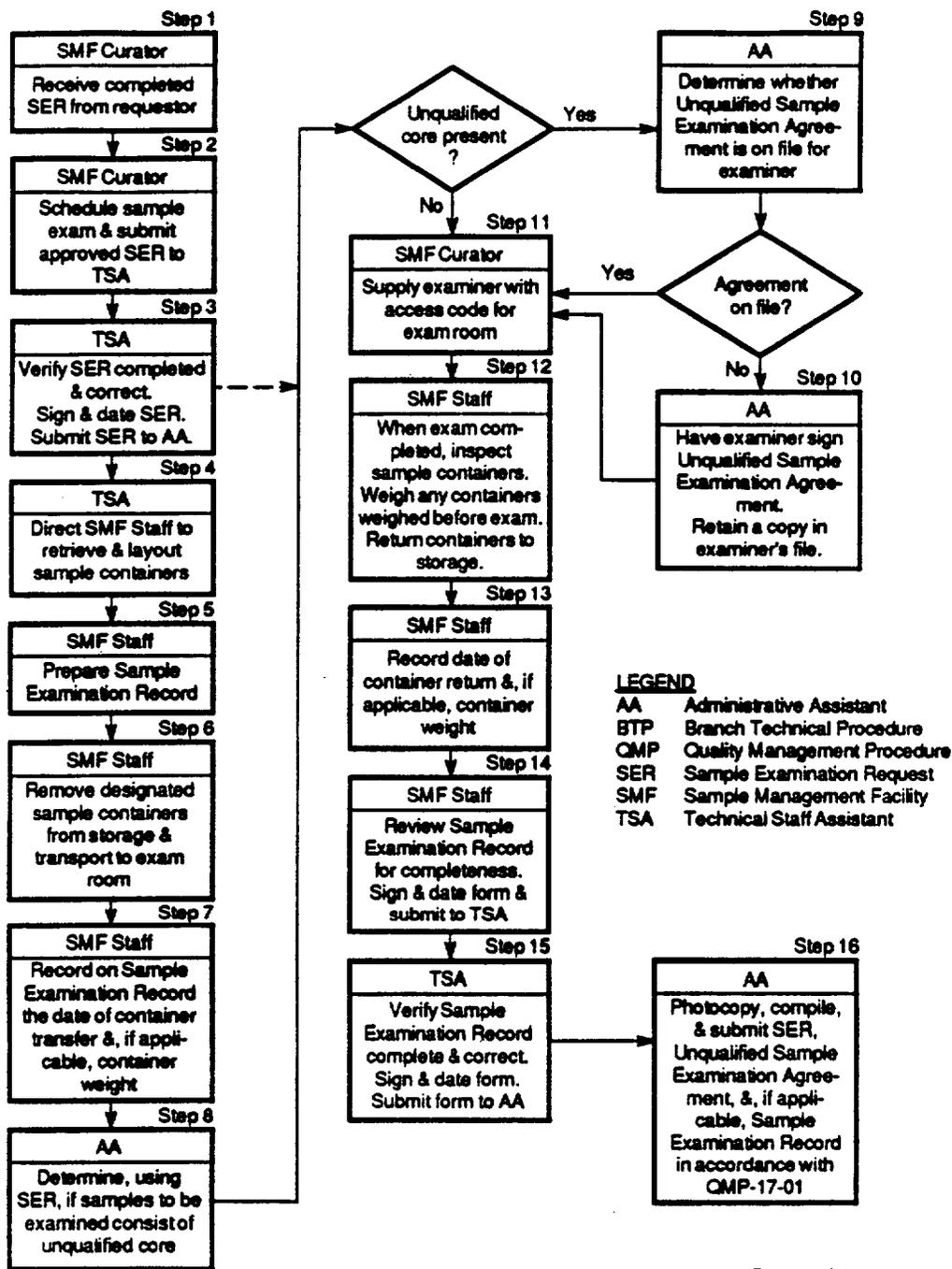


Figure 1 - BTP-SMF-005 Flowchart

**YUCCA MOUNTAIN PROJECT
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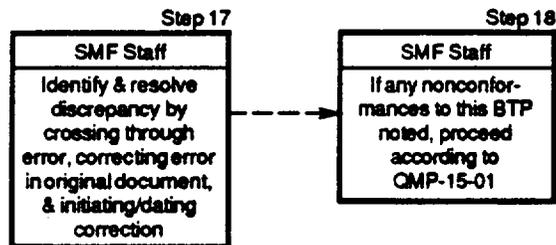
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Figure 1 - BTP-SMF-005 Flowchart (continued)

**YUCCA MOUNTAIN PROJECT OFFICE
DOCUMENT APPROVAL SHEET**

Y-AD-002
1/22/91

Title
BRANCH TECHNICAL PROCEDURE: REMOVAL OF WHOLE AND OTHER SPECIMENS
FROM SAMPLES BY THE SMF FOR SHIPMENT AND REMNANT RETURN

NO. BTP-SMF-006
[X] Q
[] Non Q

APPROVAL

PROJECT MANAGER: John E. Shaler 6/28/89
(T&MSS Assistant) Signature Date

DIRECTOR OF QUALITY ASSURANCE: Edwin L. Wilmot 6/28/89
Signature Date

YMP Branch Chief : D. E. Livingston for M. B. Blanchard 6/28/89
(OTHER, AS REQUIRED) Signature Date

REVISION 0 EFFECTIVE DATE: 7/7/89

REVISIONS

	INITIAL AND DATE			
	REVISION 1	REVISION 2	REVISION 3	REVISION 4
PROJECT MANAGER: for	<u>Edwin L. Wilmot</u> 10/26/90	<u>[Signature]</u> 3/5/91		
DIRECTOR, QA:	<u>D. G. Horton</u> 10/26/90	<u>[Signature]</u> 3/1/91		
YMP Branch Chief (OTHER, AS REQUIRED)	<u>Uel S. Clanton</u> <u>Maxwell Blanchard</u> 10/26/90	<u>[Signature]</u> 3/14/91 3/20/91		
EFFECTIVE DATE:	<u>10/26/90</u>	<u>3/20/91</u>		



TRAINING REQUIRED YES N/A NUMBER OF DAYS REQUIRED FOR TRAINING 105

COMMENTS: SELF-STUDY FOR APPLICABLE PERSONNEL

[Signature] 3/7/91
TRAINING OFFICER/TRAINING MANAGER DATE

9112020170

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1.0 PURPOSE AND SCOPE

1.1 PURPOSE

The purpose of this procedure is to facilitate the tracking and use of geologic samples collected from Yucca Mountain Site Characterization Project (YMP) boreholes and curated at the Sample Management Facility (SMF). Its goals are to maintain the traceability and identity of all samples collected, processed, and distributed to YMP Participants and other individuals and organizations.

1.2 SCOPE

The scope of this procedure includes 1) instructions for removing, packaging, and shipping specimens from YMP borehole specimens at the request of interacting individuals or organizations, 2) instructions for receipt and curation of specimen remnants returned to the SMF, 3) responsibilities of SMF staff during the requesting, assignment, removal, and shipping of specimens and the return of remnants, and 4) the documentation related to the disposition of those specimens.

2.0 APPLICABILITY

This procedure applies to all SMF personnel involved with the curation, processing, documentation, removal, or transport of borehole samples collected under YMP procedures and curated at the SMF. It also applies to any borehole samples collected under YMP procedures and curated at the SMF.

3.0 DEFINITIONS

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

3.1 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.

3.2 RECIPIENT

A Recipient is an individual from a YMP Participant or outside interest who receives a Sample Overview Committee (SOC)-authorized specimen removed by SMF staff from a YMP sample or remnant.

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3.3 REMNANT

The portion of a specimen that is returned to the SMF by a Recipient after analysis and testing has been performed is a remnant.

3.4 REQUESTOR

The Requestor is an individual from a YMP Participant or outside interest who requests to have a specimen removed from a YMP sample or remnant by SMF staff.

3.5 RUBBLE

Rubble consists of fragments of core from a single interval, the individual diameters of which average less than one-half of the diameter of the whole core.

3.6 SAMPLE

A sample is part of a population whose properties are studied to gain information about the whole or the group.

3.7 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 conserve preserved samples.

3.8 SAMPLE OVERVIEW COMMITTEE

The SOC is a committee comprised of representatives from various Participant Organizations that utilize or have an interest in the use of YMP samples. It was formed to ensure a balance between YMP sample needs, acquisition, and use and the need to curate samples for posterity.

3.9 SHIPMENT

A shipment is a designated group of specimens transferred from the SMF to a Recipient as a single unit.

3.10 SPECIMEN

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

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3.11 UNIQUE IDENTIFIER

A unique identifier is a designation that sets a documentable object or event apart from similar entities. It may consist of an assigned number, a name, an alpha-numeric designation, or a set of data items that collectively serve to specify the entity.

3.12 SAMPLE TYPE

Sample type designates the type of material that makes up a sample, i.e. core and cuttings.

4.0 RESPONSIBLE PARTIES

NOTE: The following Yucca Mountain Site Characterization Project Office (YMPO) individuals are responsible for activities identified in Section 5.0 of this procedure:

1. SMF Curator
2. SMF Staff
3. Technical Staff Assistant
4. SMF Geotechnician
5. Administrative Assistant

5.0 PROCEDURE

NOTE: A flowchart of the following processes described in this procedure is attached as Figure 1.

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Curator	1.	Review Specimen Requests, and prepare Specimen Availability Analysis, Attachment 1, for SOC.
	2.	In consultation with the SOC and the requestor, designate buffer zones or adjust requested sample intervals to allow for fractures or other significant features in the core.

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
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SMF Curator	3.	Receive approved Specimen Removal Requests from the Director, RSED, in accordance with AP-6.4Q.
	4.	Assign SMF staff to prepare and remove specimens.

SPECIMEN REMOVAL

SMF Staff	5.	Using data from the request, generate a Specimen Removal Log, Attachment 2. Include the following items: <ol style="list-style-type: none">1. Requestor name and Organization2. The borehole identifier for each specimen requested3. The requested depth interval of each specimen4. The interval reserved after SOC approval5. The type of specimen to be removed6. Information about the specimen's parent sample7. A specimen unique identifier
	6.	Remove the specimen using the appropriate technique. Record the actual depth interval of the specimen on the space provided in the Specimen Removal Log.

ON-SITE MECHANICAL TESTING

	7.	If vertical orientation of the specimen is desired, mark the specimen using one of the following methods:
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RESPONSIBLE PARTY

STEPS

PROCEDURE

SMF Staff

- a. For whole or split core sections, place red and blue orientation stripes on core with a permanent marker, with red on the right and blue on the left.
 - b. For smaller specimens (i.e., thin section stubs and plugs), cut a notch on the uphole end of the specimen.
8. If all the material in the specimen's assigned interval is to be permanently removed from the container, cut a foam spacer to the same length as the specimen, and label it with the following data:
- a. Borehole identifier
 - b. Depth interval removed
 - c. Requestor name and organization
 - d. Date removed
- Otherwise, affix a label or other permanent mark displaying the same information to the inside of the divider containing the row of core or cuttings samples.
9. If the specimen is used for mechanical or rock properties testing within the SMF, continue with the next step. Otherwise, proceed to Step 15.
10. After the Participant's test is completed, ensure that no chemical contaminant made contact with the core and return the fragments of core to its original location within the container.

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff	11.	If any remnant material has been reduced to rubble-sized fragments, package it in clear polyethylene lay-flat tubing cut to match the rubble's original interval. Mark the tubing with the depth interval represented by the rubble.
	12.	Complete the SMF Specimen Removal Log by indicating N/A on the space marked "Shipping Container #:" or by drawing a horizontal line across the space. Initial and date the "Removed:" portion of the log on the lines provided. Submit the SMF Specimen Removal Log to a second qualified SMF staff member.
Second SMF Staff	13.	Check the labels and markings associated with the specimen used. Verify that the information on the SMF Specimen Removal Log is complete and accurate. Initial and date the "Checked:" portion of the log on the lines provided. Submit the SMF Specimen Removal Log to the Technical Staff Assistant.
Technical Staff Assistant	14.	Verify that the SMF Specimen Removal Log is filled out completely and correctly. Sign and date the log in the space provided. Submit the SMF Specimen Removal Log to the Administrative Assistant for inclusion in the records package. Proceed to Step 40.

PACKAGING

SMF Staff	15.	Package the specimen using any combination of polystyrene foam, cardboard liner section, polyethylene lay-flat tubing, or sealed impermeable packaging material sufficient to completely protect the specimen against shock and, if necessary, exposure or fluid loss.
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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff	16.	<p>Apply a label or other legible marking to the outside of the packaging displaying the following data:</p> <ul style="list-style-type: none"> a. Borehole identifier b. Depth interval removed c. Requestor name and organization d. Date removed
	17.	<p>Prepare one or more containers to the specifications of the requestor or Curator to receive removed specimens. Ensure that the container has enough structural strength and sufficient dunnage to protect the specimens against accidental damage or spillage. Mark or label each shipping container with a unique Container Identifier.</p>
	18.	<p>Place removed specimens into a prepared shipping container. Record the identity of the container holding a specimen on the SMF Specimen Removal Log in the space marked "Shipping Container #:."</p>
Second SMF Staff	19.	<p>Check the labels and markings associated with the specimen removed. Verify that the information on the SMF Specimen Removal Log is complete and accurate. Initial and date the "Checked:" portion of the log on the lines provided. Submit the SMF Specimen Removal Log to the Technical Staff Assistant.</p>
Technical Staff Assistant	20.	<p>Verify that the SMF Specimen Removal Log is filled out completely and correctly. Sign and date the log in the space provided. Submit the SMF Specimen Removal Log to the Administrative Assistant for inclusion in the records package.</p>

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RESPONSIBLE PARTY

STEPS

PROCEDURE

SHIPPING

SMF Staff

21. Generate an SMF Specimen Shipment Packaging Log, Attachment 3, for each shipment prepared. Display the following data on the log:
 - a. Requestor Name and Organization
 - b. Each specimen included in the shipment and its container identifier
 - c. The Shipment unique identifier
22. Permanently label or mark each shipping container in at least two locations with the following data:
 - a. The Shipment identifier
 - b. The Requestor Name and Organization
 - c. The shipping container unique identifier

NOTE: Ensure that the labels are arranged so that each half of a two-piece container is labeled on opposite sides of a single-piece container.

23. Inspect the contents of each shipping container against the SMF Specimen Shipment Packaging Log to ensure that each specimen is present, is properly marked and packaged, and is in good condition. Mark the status of each specimen with a check in the spaces provided.
24. If the specimen shipment will not be picked up by the Requestor, and is to be delivered by any courier other than the SMF or a commercial carrier that supplies Bill of Lading or similar documentation, generate a Transfer of Custody form, Attachment 4. This form must display the following information:

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
		<ul style="list-style-type: none"> a. Shipment Unique Identifier b. Requestor Name, Organization, Address, and Telephone c. Recipient name and address, if different from above d. The number of containers in the shipment e. Total shipping weight, if applicable f. The Unique identifier of each container in the shipment. g. A description of the contents of the containers h. Any special shipping instructions
	25.	<p>For each shipment, generate an SMF Specimen Custody Receipt, Attachment 5. Include the following data:</p> <ul style="list-style-type: none"> a. The Shipment Unique Identifier b. The Name and Organization of the Requestor c. A list of each specimen included in the shipment and its container d. The shipping date
SMF Geotechnician	26.	<p>Check the shipment against the SMF Specimen Custody Receipt to ensure its accuracy and completeness. Sign and date the form in the space provided.</p>

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Geotechnician	27.	If the recipient will take custody of the shipment at the SMF, continue with the next step. Otherwise, make a photocopy of the SMF Specimen Custody Receipt, and place it inside one of the shipping containers. Submit the original to the Administrative Assistant for mailing to the recipient.
SMF Staff	28.	Close and seal each shipping container. Document this step by signing and dating in the space provided on the SMF Specimen Shipment Packaging Log.
	29.	When the shipper has arrived to take custody of the shipment, if applicable, have the courier sign and date the Transfer of Custody form in the Person Accepting Custody space, then Sign and date the Person Releasing Custody space. Otherwise, complete the shipper's bill of lading.
	30.	Verify that the shipping date on the SMF Specimen Shipment Packaging Log and the Transfer of Custody form, if present, is correct. If not, change it by drawing a line through the existing date, writing in the correct date, and initialing the change. Sign and date the SMF Specimen Shipment Packaging Log in the space provided, and submit it and the Transfer of Custody form, if applicable, to the Technical Staff Assistant.
Technical Staff Assistant	31.	Verify the proper completion of the Transfer of Custody form and the SMF Specimen Shipment Packaging Log, if applicable. Sign and date in the space provided, and submit the completed forms to the Administrative Assistant for inclusion in the records package.

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
Administrative Assistant	32.	When custody of the shipment has been transferred to a courier other than the designated recipient, mail the original SMF Specimen Custody Receipt to the recipient. After Participant returns Specimen Custody Receipt, file in the records package.

REMNANT RETURN

SMF Staff	33.	On receipt of remnants, determine that documentation supplied is adequate to track the origin of the material received. If necessary, contact the sender to obtain the proper information. Acknowledge receipt of the remnants on the shipper's documentation.
	34.	Generate an SMF Remnant Return Log, Attachment 6, for each group of remnants received. For each remnant, supply the following data: <ul style="list-style-type: none">a. The original Specimen Identifier of the remnantb. The Borehole name and depth interval from which the original specimen was removedc. The remnant's original Sample Typed. The Name and Organization of the individual for whom it was removede. The date of removal of the original specimenf. The date of the remnant's returng. The analyses to which the remnant was subjectedh. The condition of the remnant

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff	35.	<p>If necessary, repackage the remnants in such a manner that the identity and integrity of the material is maintained. Label or otherwise mark each package with the following information:</p> <ol style="list-style-type: none"> a. A Unique identifier b. The borehole and depth interval from which the original specimen was removed c. The Sample Type of the original specimen d. The date of the specimen's removal e. The analyses to which the remnant was subjected
	36.	<p>Place the remnant in an appropriate box containing other remnants of similar origin. If no appropriate containers are available, continue with the next step. Otherwise, proceed to Step 38.</p>
	37.	<p>Assign a unique Remnant Container Identifier to a new box. Mark or label the box with the identifier. Document the new box identity, and assign it a storage location in a separate area away from any boxes containing unremoved samples or unshipped specimens.</p>
	38.	<p>Record the identifier of the box containing the remnant on the SMF Remnant Return Log. Return the box to its assigned storage location. Sign and date the SMF Remnant Return Log in the space provided. Submit the log to the Technical Staff Assistant for review.</p>

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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
Technical Staff Assistant	39.	Verify that the SMF Remnant Return Log is complete and information is properly entered. Sign and date the form in the space provided. Submit the SMF Remnant Return Log to the Administrative Assistant for inclusion in a records package.

RECORD PACKAGES

Administrative Assistant	40.	Receive all relevant specimen removal, shipping, and remnant records. Create separate records packages for each specimen removal group, specimen shipment, and remnant return group. Photocopy, compile, and submit the records in accordance with QMP-17-01.
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IDENTIFICATION AND RESOLUTION OF DISCREPANCIES

SMF Staff	41.	<p>Identify and resolve any discrepancy upon discovery by crossing through the error, correcting it in the original document, and initialing and dating the correction.</p> <p>If the correction is not self-explanatory, then</p> <ol style="list-style-type: none">Assign a number to the correction.Attach a sheet to the original record that fully describes the problem and the correction performed.If the discrepancy is discovered after an activity or form has been completed, then handle according to the procedure outlined in Section 5.7 of BTP-SMF-001, Sample Management for the YMPO.
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<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff	NOTE:	Discrepancies covered by this procedure are only those that result from the actions of staff members using the procedure. A discrepancy exists when there is incorrect information that significantly affects documentation of notation and that is beyond the scope of the immediate activity of the form being completed.
	42.	If there are any nonconformances to this procedure noted during or after associated activities, proceed according to QMP-15-01, Control of Nonconformances.
	NOTE:	A nonconformance exists when there is a deficiency in characteristics, documentation, or procedures that renders the quality of an activity or an item unacceptable or indeterminant. The intent of nonconformance reporting is to ensure the resolution of the conditions not meeting the requirements or to ensure that undefined conditions are defined.

6.0 REFERENCES

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

6.1 REQUIREMENTS DOCUMENTS

None

6.2 INTERFACE DOCUMENTS

YMP Glossary, YMP/89-15

AP-6.4Q, Procedure for the Submittal, Review, and Approval of Requests for Yucca Mountain Project Geologic Specimens

QMP-15-01, Control of Nonconformances

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

BTP-SMF-001, Sample Management for the Yucca Mountain Site
Characterization Project Office

7.0 FIGURES AND ATTACHMENTS

Figure 1, BTP-SMF-006 Flowchart

Attachment 1, Specimen Availability Analysis

Attachment 2, SMF Specimen Removal Log

Attachment 3, SMF Specimen Shipment Packaging Log

Attachment 4, Transfer of Custody Form

Attachment 5, SMF Specimen Custody Receipt

Attachment 6, SMF Remnant Return Log

8.0 RECORDS

The following Quality Assurance Documents are generated by this procedure:

1. SMF Specimen Removal Log
2. SMF Specimen Shipment Packaging Log
3. Transfer of Custody Form (If Applicable)
4. SMF Specimen Custody Receipt
5. SMF Remnant Return Log

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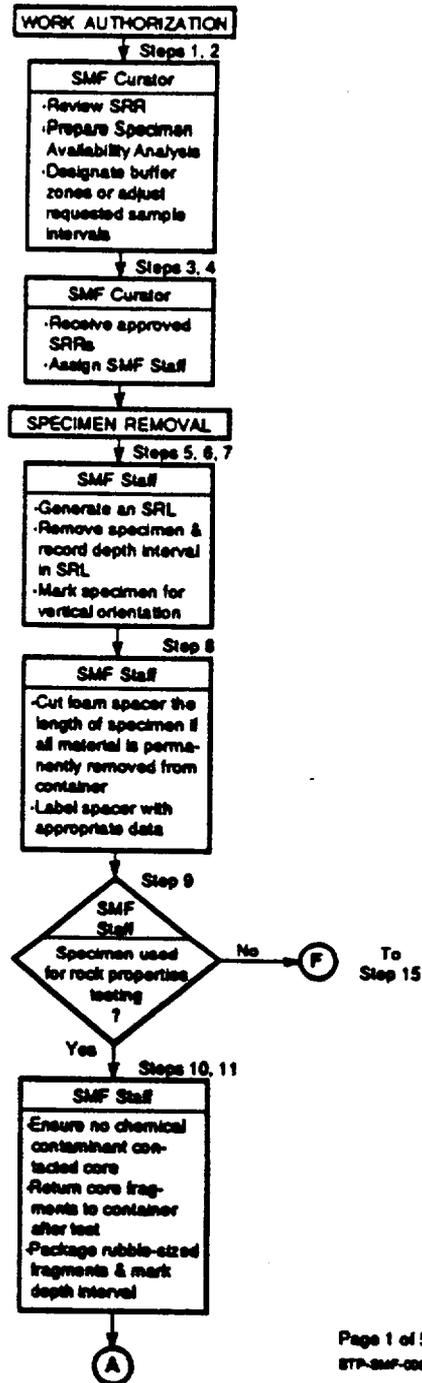
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LEGEND

AA Administrative Assistant
FO Field Operations
RCI Remnant Container Identifier
RRL Remnant Return Log
SCR Specimen Custody Receipt
SMF Sample Management Facility
SOC Sample Overview Committee
SRL Specimen Removal Log
SRR Specimen Removal Request
SSPL Specimen Shipment Package Log
TSA Technical Staff Assistant



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BTP-SMF-006.08/2-12-01

Figure 1 - BTP-SMF-006 Flowchart

YUCCA MOUNTAIN PROJECT PROCEDURE

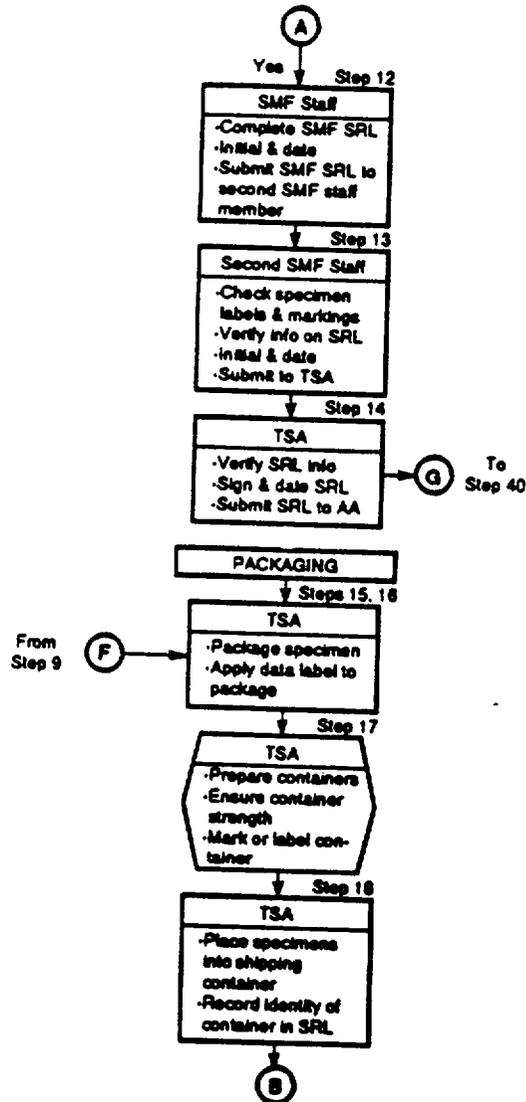
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Figure 1 - BTP-SMF-006 Flowchart (continued)

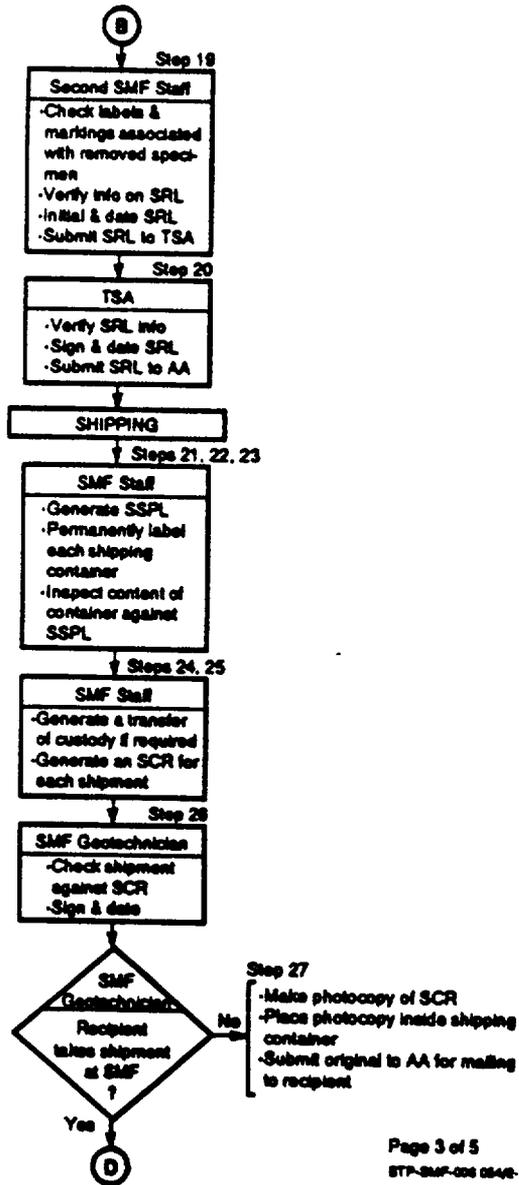
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BTP-SMF-006 0548-12-01

Figure 1 - BTP-SMF-006 Flowchart (continued)

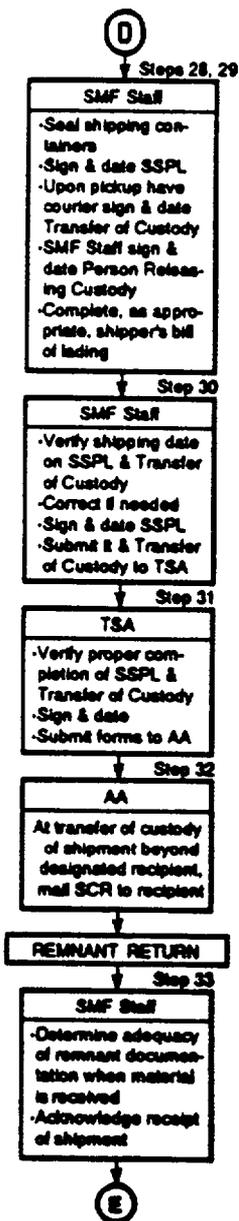
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Figure 1 - BTP-SMF-006 Flowchart (continued)

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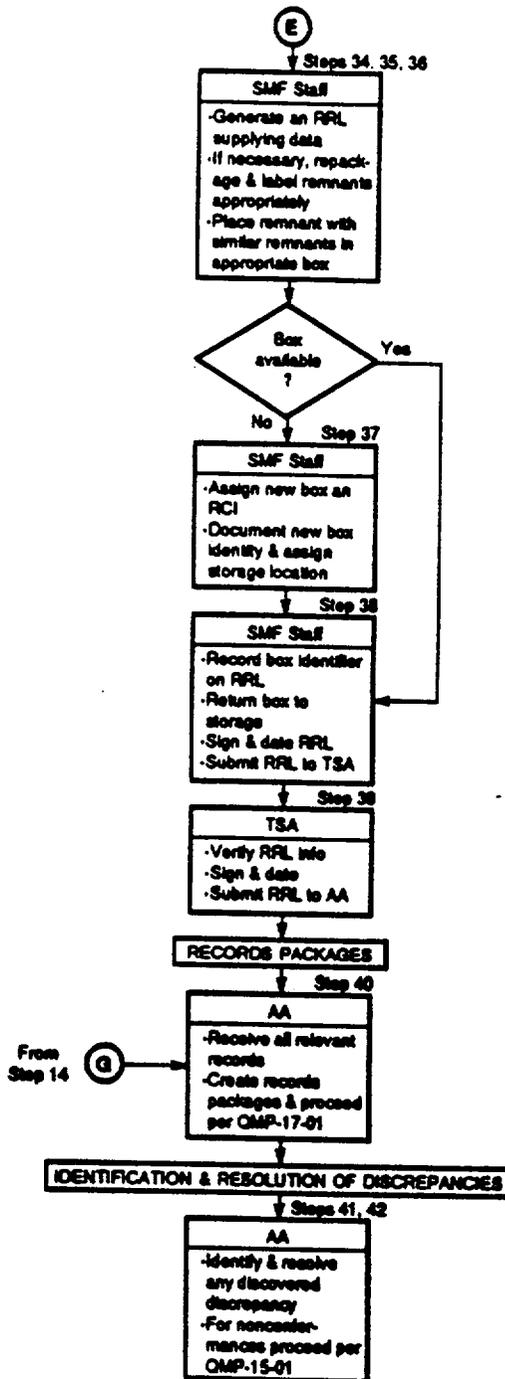


Figure 1 - BTP-SMF-006 Flowchart (continued)

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SPECIMEN AVAILABILITY

Pending Requests For Core Specimens

MACCSITS PROLOG V 0

Requestor: Marilyn Ten Brink	Organization: LLNL	BozHole: 022 USW16	Box: 005	Top: 1,147 0	Bottom: 1,154 2
Specimens Already Removed:			Intervals in this Request:		
SpecID:	Type:	Removed By:	Top:	Bottom:	Piece Lengths:
0015970	WAX		1,147 3	1,148 1	Number:
0015971	ThinSec		1,149 0	1,149 4	Length:
0015972	WCSpec		1,153 5	1,154 2	0 0
			1,151 0	1,152 5	

NOTE: Piece Length determinations are made using unbroken whole core segments. Requestor intervals may include continuous sections that do not meet these criteria.

No Pending Requests Conflicts...

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MacCSITS Proto v.0

SMF SPECIMEN REMOVAL LOG

Thursday, January 17, 1991
10:32:49

SPECIMENS RESERVED BY:		ID#	020	John	Stuckless	USGS	REQUEST DATE:	1/15/91			
SPECIMEN INFO		SPECIMEN TYPE		BY	DATE						
016380	IOE	BOTTOM				Frag			REMOVED		
	Requested:	2,293.5	2,293.7			Sample:	002063		CHECKED		
	Reserved:	2,293.3	2,293.5			Box:	250				
	Actual:					Borehole	006 USW GU3				Shipping Container #
016381	IOE	BOTTOM				Frag			REMOVED		
	Requested:	2,395.5	2,396.5			Sample:	002071		CHECKED		
	Reserved:	2,395.0	2,396.0			Box:	250				
	Actual:					Borehole	006 USW GU3				Shipping Container #
016378	IOE	BOTTOM				WCSpec			IN MOVTD		
	Requested:	2,199.2	2,199.5			Sample:	002093		CHECKED		
	Reserved:	2,199.2	2,199.5			Box:	249				
	Actual:					Borehole	006 USW GU3				Shipping Container #
016379	IOE	BOTTOM				WCSpec			REMOVED		
	Requested:	2,290.8	2,291.1			Sample:	002082		CHECKED		
	Reserved:	2,290.8	2,291.1			Box:	249				
	Actual:					Borehole	006 USW GU3				Shipping Container #
016382	IOE	BOTTOM				WCSpec			REMOVED		
	Requested:	2,531.1	2,531.8			Sample:	002084		CHECKED		
	Reserved:	2,531.1	2,531.8			Box:	271				
	Actual:					Borehole	006 USW GU3				Shipping Container #

5 records printed of 5 records in document

IS ASSISTANT _____ Date _____

YUCCA MOUNTAIN PROJECT PROCEDURE

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SMF Specimen Shipment Packaging Log

MacCSITS Print v 0

January 28, 1991 16:06

Shipment ID: 0002 Shipping Date: 12/18/90

Recipient: 041 Memo Organization: SNL Phone: (505) 846-5929
Robert Glass Address: Sandia National Laboratories Alt: (800) 846-5929

P.O. Box 5800
City/State/Zip: Albuquerque, NM 87105-0800

Comment: shipped in 2 standard core sample boxes

ContainerID	SpecID#	Q/Sample	Spec. Type	Top	Bottom	Specimen Package Sealed?	Labels Correct?
000002	015976	001007	WC:Spec	1,559.7	1,561.4		
000002	015977	002253	WC:Spec	1,578.0	1,580.0		
000003	015978	002006	WC:Spec	1,685.0	1,688.0		
000003	015973	000888	WC:Spec	1,343.2	1,344.0		
000003	015975	001004	WC:Spec	1,538.0	1,538.4		
000003	015979	002011	WC:Spec	1,741.0	1,742.0		
000003	015974	002240	WC:Spec	1,489.2	1,478.2		

Geotechnician _____ Date _____ IS Assistant _____ Date _____

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**YUCCA MOUNTAIN PROJECT
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YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT TRANSFER OF CUSTODY FORM		Page ____ of ____
REQUESTOR: Robert Glass	SHIPMENT ID: 0002	SHIPPING ADDRESS: _____ _____ _____ _____
SNL Sandia National Laboratories P.O. Box 5800 Albuquerque, NM 87165-0000	SHIPPING INSTRUCTIONS: _____	CONTAINER ID: _____
NUMBER OF CONTAINERS: _____	SHIPMENT DESCRIPTION: _____	TOTAL WEIGHT: _____
Person Accepting Custody: _____	Date: _____	Time: _____
Person Releasing Custody: _____	Date: _____	Time: _____
		T.S. Assistant: _____

BTP-SMF-006

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Attachment 4 - Transfer of Custody Form

YUCCA MOUNTAIN PROJECT PROCEDURE

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SMF Specimen Custody Receipt

MacCSITS Proto v 0

Recipient: 041 Name: Robert Glass
 SMIL
 Sandia National Laboratories
 P.O. Box 5800
 Albuquerque, NM 87185-9800

Date Received: _____
 Shipment ID: 0002 Shipping Date: 12/18/90
 SMF Geotechnician: _____ Date: _____

Container ID	Spec ID	Cl Sam	Cl Bor	Spec. Type	Top	Bottom
000002	015976	001007	USW G1	WCSpec	1,559.7	1,561.4
000002	015977	002253	USW G4	WCSpec	1,578.0	1,580.9
000003	015978	002005	USW GUG	WCSpec	1,685.6	1,688.0
000003	015973	000906	USW G1	WCSpec	1,343.2	1,344.0
000003	015975	001004	USW G1	WCSpec	1,538.0	1,530.4
000003	015979	002011	USW GUG	WCSpec	1,741.9	1,742.9
000003	015974	002240	USW G4	WCSpec	1,489.2	1,470.2

I hereby acknowledge the receipt of the Specimens listed above
I will return this form to the SMF within 10 business days of
receipt.

Recipient _____ Date _____

Please Sign this form and return to:
 Sample Management Facility
 Yucca Mountain Site Characterization Project
 P.O. Box 617
 Mercury, NV 89003-0617

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SMF REMNANT RETURN LOG

MACCSITS PROLO V. 0

Mon, Jan 28, 1991

Specimens Remnants Returned on January 28, 1991

Parent Specimen:	Date Returned:	Condition:	Analytical History:	Date Removed:	Requestor Data:	From Borehole:	BoxID:	Depth Interval:	Stored in Container #:	Shell Location:
0000001	1/28/91	Intact	Acid, XRD							
0016273	119.7	119.9	12/13/90	019	Barbara Carbo	000 USW G4	LOS ALAMOS	117.0	123.2	123.2
0000002	1/28/91	Intact	Acid, XRD							
0016274	766.0	766.2	12/13/90	019	Barbara Carbo	000 USW G4	LOS ALAMOS	753.0	761.0	761.0
0000003	1/28/91	Intact	Acid, XRD							
0016275	1,261.8	1,262.0	12/13/90	019	Barbara Carbo	000 USW G4	LOS ALAMOS	1,197.5	1,205.1	1,205.1
0000004	1/28/91	Crushed	XRD, GasChem							
0016276	1,258.2	1,258.6	12/13/90	019	Barbara Carbo	000 USW G4	LOS ALAMOS	1,251.0	1,260.0	1,260.0

Packaged by: _____ Date: _____

Shelved by: _____ Date: _____

TS Assistant: _____ Date: _____

Page 1

YMP-007-R1
4:22:91

**YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT
INTERIM CHANGE NOTICE**

ICN No.: 2
Page 1 of 1

Title: ACCEPTANCE FOR CURATION BY THE SAMPLE
MANAGEMENT FACILITY OF SELECTED SAMPLES
AND DOCUMENTATION

Document No.:
BTP-SMF-007

Rev. No.:
0

Effective Date:
7/1/91

REQUIRED CHANGE(S): MAJOR MINOR (only PCB Chief approval required)

PAGE 8 OF 8:

FIGURE 2. Sample Collection Report:

Change Form Number from BTPSMF7-1 to YMP-046-R1

INSTRUCTIONS TO DOCUMENT HOLDERS:

1. Place the ICN Approval Page at the beginning of the affected document.
2. Replace Page 8 of 8 with ICN Page 8 of 8 attached.

REASON FOR CHANGE (CAR, NCR, SDR, or other deficiency or commitments)

Referenced form in procedure does not match ICN changes.

APPROVAL

PROJECT MANAGER

N/A

Signature

N/A

Date

DIRECTOR OF QUALITY ASSURANCE

N/A

Signature

N/A

Date

(OTHER, AS REQUIRED)

N/A

Signature

N/A

Date

PCB CHIEF *REP* 6/1/91
(Minor ICNs only)

[Handwritten Signature]

Signature

6-14-91

Date

TRAINING REQUIRED

YES N/A

NUMBER OF DAYS REQUIRED FOR TRAINING N/A

COMMENTS:

FORM NUMBER CHANGE -
NO CHANGE TO INTENT

[Handwritten Signature]
Training Officer/Training Manager

6/25/91
Date

9112020174 10 pp.

ENCLOSURE 7

INTERIM CHANGE NOTICE

N-QA-023
4/90

ICN Number:

1

Effective Date:

6/13/90

Page 1 of 1

Applies to:

Acceptance for Curation by the Sample
Management Facility of Selected Samples

Number BTP-SMF-007

Rev. 0

Title and Documentation

REQUIRED CHANGE(S): (Minor Yes No)

PARAGRAPH

CHANGE TO

5.4.1.2, line 1

Delete "SMP"

5.4.2, line 3

Delete "SMP"

Figure 2

Delete "SMP" from bar code label area

APPROVALS

Division Director
Maxwell Blumhardt

Date
6-1-90

Director, QA

Charles Hosta

Date
6/6/90

Project Manager

[Signature]

Date
6/6/90

**YUCCA MOUNTAIN PROJECT OFFICE
BRANCH TECHNICAL PROCEDURE**

N-QA-O48
11/88

Title: ACCEPTANCE FOR CURATION BY THE
SAMPLE MANAGEMENT FACILITY OF
SELECTED SAMPLES AND DOCUMENTATION

No. BTP-SMF-007 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 acceptance for curation by the Sample Management Facility (SMF) of Yucca Mountain Project (Project) samples and documentation not covered by other Project administrative procedures or Project Office branch technical procedures.

2.0 APPLICABILITY

This procedure applies to Project Sample Management (SM) personnel and support staff performing functions related to acceptance for curation by the SMF of selected Project samples and documentation obtained from field sites.

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, remnants, and records. 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 the T&MSS contractor 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. The various types of samples covered by this procedure include geotechnical samples, environmental samples, construction materials, and other samples collected at Project field sites.

APPROVED BY -

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

**YUCCA MOUNTAIN PROJECT OFFICE
BRANCH TECHNICAL PROCEDURE**

N-QA-048
11/88

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3.4 Collector

A Collector is a staff member or representative of any of the Project participating or outside interests who submits samples or documents to the SMF for curation.

4.0 RESPONSIBILITIES

4.1 Collector

The Collector shall submit to the SMF documentation related to all Project sample collection activities specified in this procedure. The Collector may submit samples to the SMF for curation.

4.2 Curator

The SMF Curator shall supervise SM staff members and support personnel performing activities related to acceptance of samples and documentation for curation and storage at the SMF.

4.3 Technical Staff (TS) Assistant

The TS Assistant will verify sample collection reports associated with samples and field documents submitted to the SMF for curation, if applicable.

4.4 Geologist

The SMF or FO Geologist shall perform sample and documentation handling activities, including receiving, labeling, placing in containers, and storing.

4.5 Geotechnician

The SMF or FO Geotechnician shall perform sample handling and documentation activities, including receiving, labeling, placing in containers, and storing.

4.6 SMF Administrative Assistant

The SMF Administrative Assistant shall submit quality assurance (QA) records resulting from implementation of this procedure to the T&MSS Local Records Center (LRC).

4.7 Receptionist

The Receptionist shall be responsible for control of access to the SMF by Collectors.

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4.8 Reynolds Electrical & Engineering Company, Inc.

Reynolds Electrical & Engineering Company, Inc. Teamsters and Laborers shall provide general drilling services and perform labor activities, including unloading and storing of samples and operation of fork lifts and other materials-handling equipment.

5.0 PROCEDURES

5.1 Responsibilities for Curation of Project Samples and Documents

Various types of samples will be collected and documents generated in support of the site characterization studies at Yucca Mountain (Figure 1). Samples may be stored at the SMF or at the Collectors' laboratories; however, the SMF will maintain selected collection documentation on samples collected for the Project from which testing or analytical data will be used to support the license application.

5.2 Sample Types

Samples will be collected from surface operations (e.g., trenching), from surface-based boreholes, and from underground operations (e.g., drift mining). These samples include geotechnical samples, environmental samples, construction materials, and other samples, and may be submitted to the SMF for curation.

5.2.1 Surface Samples

5.2.1.1 Most surface samples covered by this procedure will be stored by Collectors and will fall under participating organizations' QA programs. Copies of all sample collection records will be located at and tracked by the SMF. A Collector may also submit samples and documents to the SMF to store and track. A Collector may want to collect casual (undocumented) samples; however, any data derived from these casual samples cannot be used in support of the license application.

5.2.1.2 Surface samples include hand and bulk rock samples, alluvium, soils, fluids, and construction materials. Acquisition sites may be the ground surface, surface stations (e.g., ambient air, precipitation), streams and creeks, outcrops, trenches, construction sites, etc.

5.2.2 Surface-based Borehole Samples

Surface-based borehole samples will be stored by both the SMF and Collectors. Core and cuttings retrieved from the majority of surface-based boreholes will be stored at and tracked by the SMF. Fluid samples will be stored by both the SMF and Collectors.

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5.2.3 Underground Samples

Underground samples will be collected during construction of the exploratory shaft facility (ESF). Samples will be collected from the shaft and drifts. Rock samples covered by this procedure include hand- and bulk-size geologic samples. Collection and documentation requirements for core and cuttings from the ESF are described in Project Office Branch Technical Procedure (BTP) BTP-SMF-008, and muck sampling requirements are covered in Project Administrative Procedure (AP) AP-6.6Q. Fluids may be collected from drilling operations (e.g., drilling fluids, produced gases and liquids), construction materials, utility waters, geologic formations, and site characterization testing.

5.3 Document Types

Copies of selected collection documentation associated with all samples collected for site characterization from which data will be used in support of the license application are stored and tracked by the SMF. These documents include those associated with samples collected by Collectors and stored by the SMF, as well as those stored by Collectors.

5.4 Acceptance for Curation of Samples and Documents

After collection of samples intended for use in site characterization, a Collector shall submit a completed Sample Collection Report (Figure 2) with each sample collected and/or submitted to the SMF for curation. This report shall be completed prior to submission of the samples to the SMF or the Collector's organization. A copy of the Sample Collection Report must be submitted to the SMF within 10 working days of collection, even if the actual sample is retained by the Collector.

5.4.1 Transfer of Custody of Samples

5.4.1.1 Upon arrival at the SMF, the Collector shall register at the Reception area. Samples or sample containers will be unloaded and placed in the Shipping and Receiving area or other appropriate area. SM staff will determine if the following information is completed on each Sample Collection Report: the date sample was collected, Collector and organization, and Collector's sample identification. Other information should include sample type; type of field site; collection location; sample weight, volume or dimensions; type of field photographs (if applicable); storage requirements; and remarks.

5.4.1.2 SM staff will determine if all SMP bar code labels have been properly applied to the sample (if possible), inside the sample container, on the outside of the sample container, and on the Sample Collection Report. If a photograph of the sample at its acquisition site is submitted with the sample, a bar code label should appear on the back of the photograph. SM staff will compare the field photograph to the sample to verify that the sample is adequately documented.

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5.4.1.3 If the sample and Sample Collection Report are submitted to the SMF, the Collector and the SM staff member completing the custody change will sign and date the Sample Collection Report. A copy of the report will be given to the Collector. These signatures are only necessary if the sample is submitted for curation along with the Sample Collection Report.

5.4.2 Containerization and Labeling of Samples

The sample will be placed in an appropriate container, depending upon the type of sample. Information from the Sample Collection Report will be used to generate container labels for the sample and will contain the SMP bar code number, sample type, collection location, Collector, date of collection, date of receipt by the SMF, and date of storage. These labels will then be affixed to the appropriate sample containers. The container will be sealed according to the specifications of the Collector.

5.4.3 Sample Storage

The container will be assigned a storage location (e.g., storage racks, cooler), depending upon the type of storage container and appropriate environmental conditions (e.g., shelf life, temperature) designated by the Collector. Storage location and date and time of storage will be recorded on the Sample Collection Report. If samples are not placed in permanent storage immediately, they will be placed in a designated temporary storage area maintained at required environmental conditions.

5.4.4 Verification

After completion of the Sample Collection Report, an SM staff member will verify that the report has been properly completed by signing and dating the form. This signature also indicates the SM staff member who received and verified the Sample Collection Report if no sample was submitted with the report.

5.4.5 Records Storage

All documents and records submitted to the SMF for curation will be submitted to the LRC. Working copies will be retained at the SMF Documents Center. Access to these documents and records will be obtained through authorization by the Curator.

5.5 Identification and Resolution of Discrepancies

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 by crossing through the error, correcting it on the original document, and initialing and dating 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 performed.

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5.6 Nonconformance Reporting

A nonconformance exists when there is a deficiency in characteristic, procedure, or documentation 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, SM staff members 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

AP-6.6Q, Field Collection, Documentation, and Specimen Removal of ESF Shaft and Drift Rock.

BTP-SMF-001, Sample Management for the Yucca Mountain Project Office.

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

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

7.0 FIGURES

Figure 1 - Location and Tracking of Samples and Documentation.

Figure 2 - Sample Collection Report.

8.0 QA RECORDS

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

1. Sample Collection Report.
2. Photographs.

**YUCCA MOUNTAIN PROJECT OFFICE
BRANCH TECHNICAL PROCEDURE**

N-QA-O48
11/88

Title ACCEPTANCE FOR CURATION BY THE
SAMPLE MANAGEMENT FACILITY OF
SELECTED SAMPLES AND DOCUMENTATION

No. BTP-SMF-007 **Rev.** 0
Effective Date 7/7/89
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General Acquisition Location	Sample Type	Samples and Documents Stored/Tracked by		Samples Stored by Collector	Documents Stored/Tracked by SMF
		SMF	Collector		
Surface	Muck	√			
	Bulk	√		√	√
	Hand	√		√	√
	Casual		√		
	Soils	√		√	√
	Alluvium	√		√	√
	Construct.	√	√	√	√
	Biota	√	√	√	√
	Fluids	√	√	√	√
Surface-based Borehole	Cuttings	√			
	Core	√			
	Fluids	√	√	√	√
Underground	Cuttings	√			
	Core	√			
	Bulk	√		√	√
	Hand	√		√	√
	Fluids	√	√	√	√

Figure 1. Location and Tracking of Samples and Documents.

YMP-007-R1
4/22/91

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT INTERIM CHANGE NOTICE

Procedure No.: BTP-SMF-007
ACCEPTANCE FOR CURATION BY THE SAMPLE
MANAGEMENT FACILITY OF SELECTED
SAMPLES & DOCUMENTATION

Rev. No.:
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ICN No.:
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YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY	
SAMPLE COLLECTION REPORT	YMP-046-R1 6/6/91
Date Sample Collected _____	Page _____ of _____
Sample Collector _____	
Organization _____	
Collector's Sample ID _____	
<p>PLACE BAR CODE LABEL HERE</p>	
TYPE OF SAMPLE: rock muck soil liquid gas <i>(circle)</i> other <i>(specify)</i> _____	
TYPE OF SITE <i>(Circle all appropriate entries)</i>	
SURFACE: trench outcrop borehole other	ESF: Shaft Drift borehole muck pile in place other
COLLECTION LOCATION: _____	
SAMPLE: weight _____, volume _____, dimensions _____	
FIELD PHOTOS <i>(circle)</i> prints slides instant prints video photogrammetry NA	
STORAGE REQUIREMENTS: _____	
REMARKS: _____	
SAMPLE TRANSFER TO SMF <i>(Check one)</i> <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 _____

Figure 2 - Sample Collection Report

BTP-SMF-007