

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 [X] Q [] Non Q
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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 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:	<u>E. L. Wilmot</u> 10/26/90	<u>[Signature]</u> <u>8/6/91</u>		
DIRECTOR, QA:	<u>D. G. Horton</u> 10/26/90	<u>[Signature]</u>		
YMP Branch Chief	<u>Uel S. Clanton</u>	<u>[Signature]</u>		
(OTHER, AS REQUIRED)	<u>M. B. Blanchard</u> 10/26/90	<u>[Signature]</u> 8-2-91 for Maxwell Blanchard		
EFFECTIVE DATE:	<u>10/26/90</u>	<u>Complete Revision</u>		

8/19/91



TRAINING REQUIRED YES N/A

NUMBER OF DAYS REQUIRED FOR TRAINING 9

COMMENTS:

SELF-STUDY FOR
Borehole Personnel

9112020164 911121
PDR WASTE PDR
WM-11

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

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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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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.	<p>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:</p> <ol style="list-style-type: none"> a. Borehole ID b. Number of containers included in the shipment c. Date of the shipment d. 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> <ul 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:
- Container ID
 - Borehole ID
 - Depth interval of the container
 - A list of existence codes for each depth interval within the container
 - A list of specific steps for processing cuttings, with space for checking the completion of each
 - 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> <ul 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:

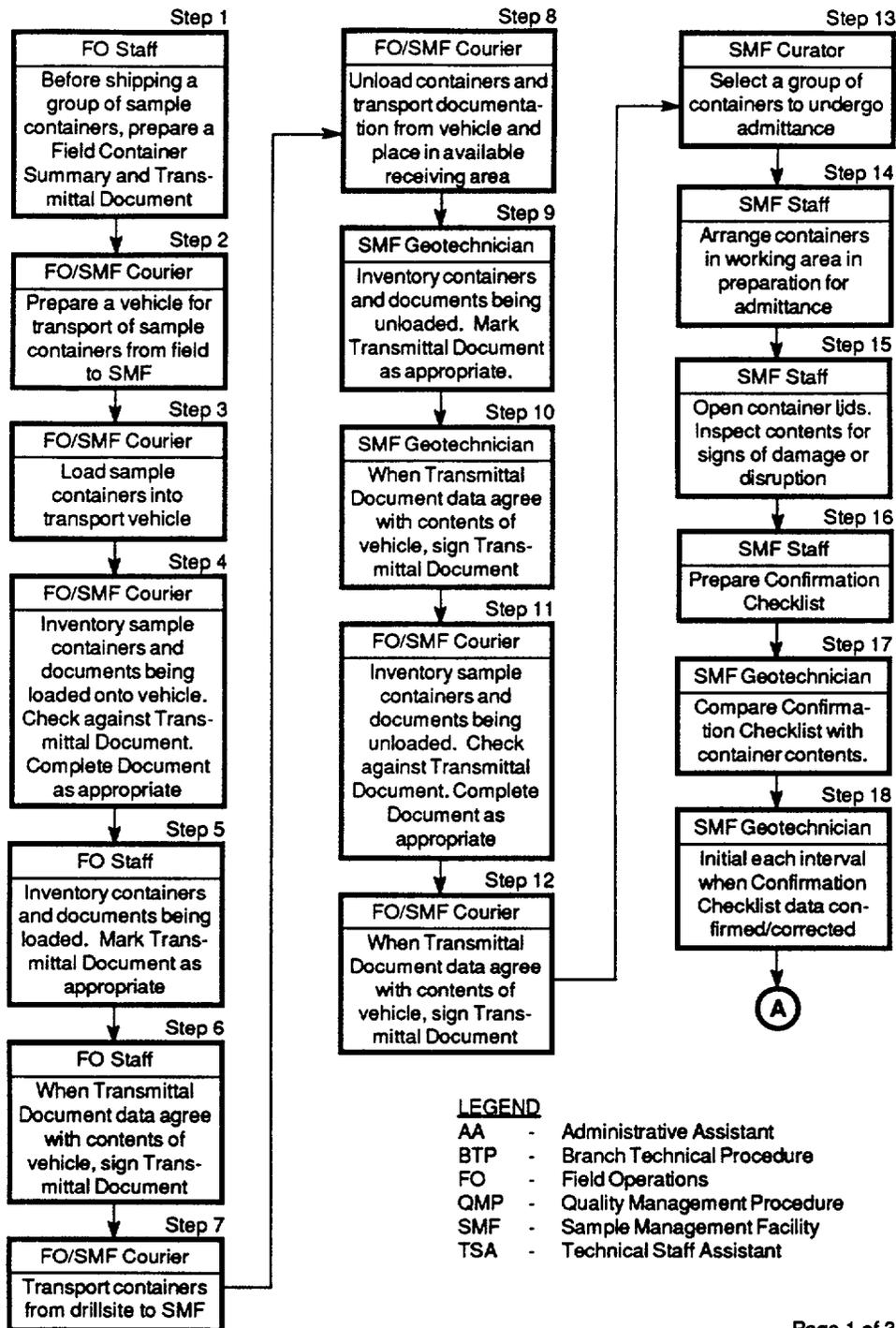
1. Field Container Summary and Transmittal Document
2. Confirmation Checklist
3. Cuttings Processing Checklist
4. Core Processing Checklist
5. Core Photography Log

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LEGEND

- AA - Administrative Assistant
- BTP - Branch Technical Procedure
- FO - Field Operations
- QMP - Quality Management Procedure
- SMF - Sample Management Facility
- TSA - Technical Staff Assistant

Figure 1 - BTP-SMF-002 Flowchart

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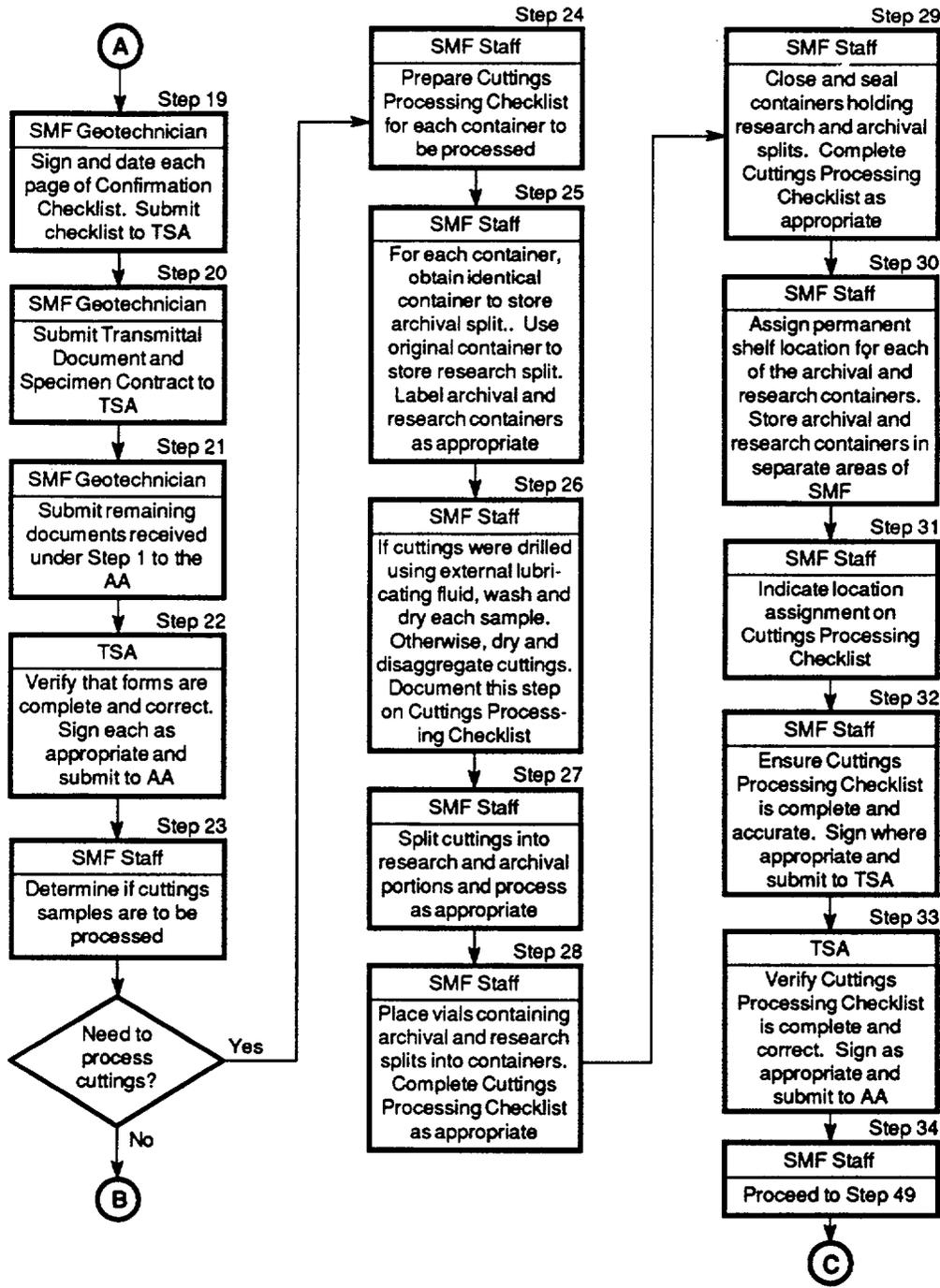


Figure 1 - BTP-SMF-002 Flowchart (continued)

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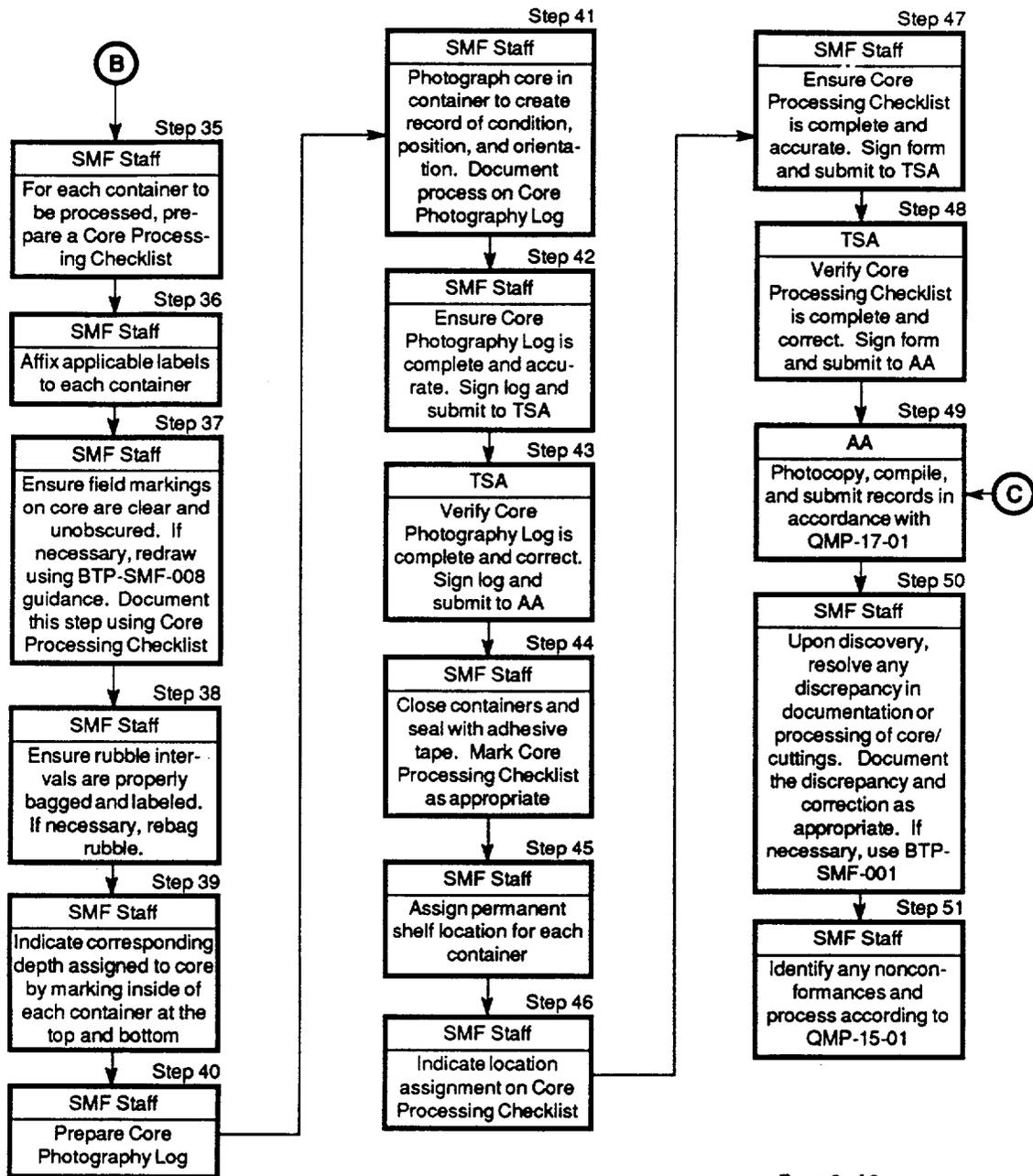


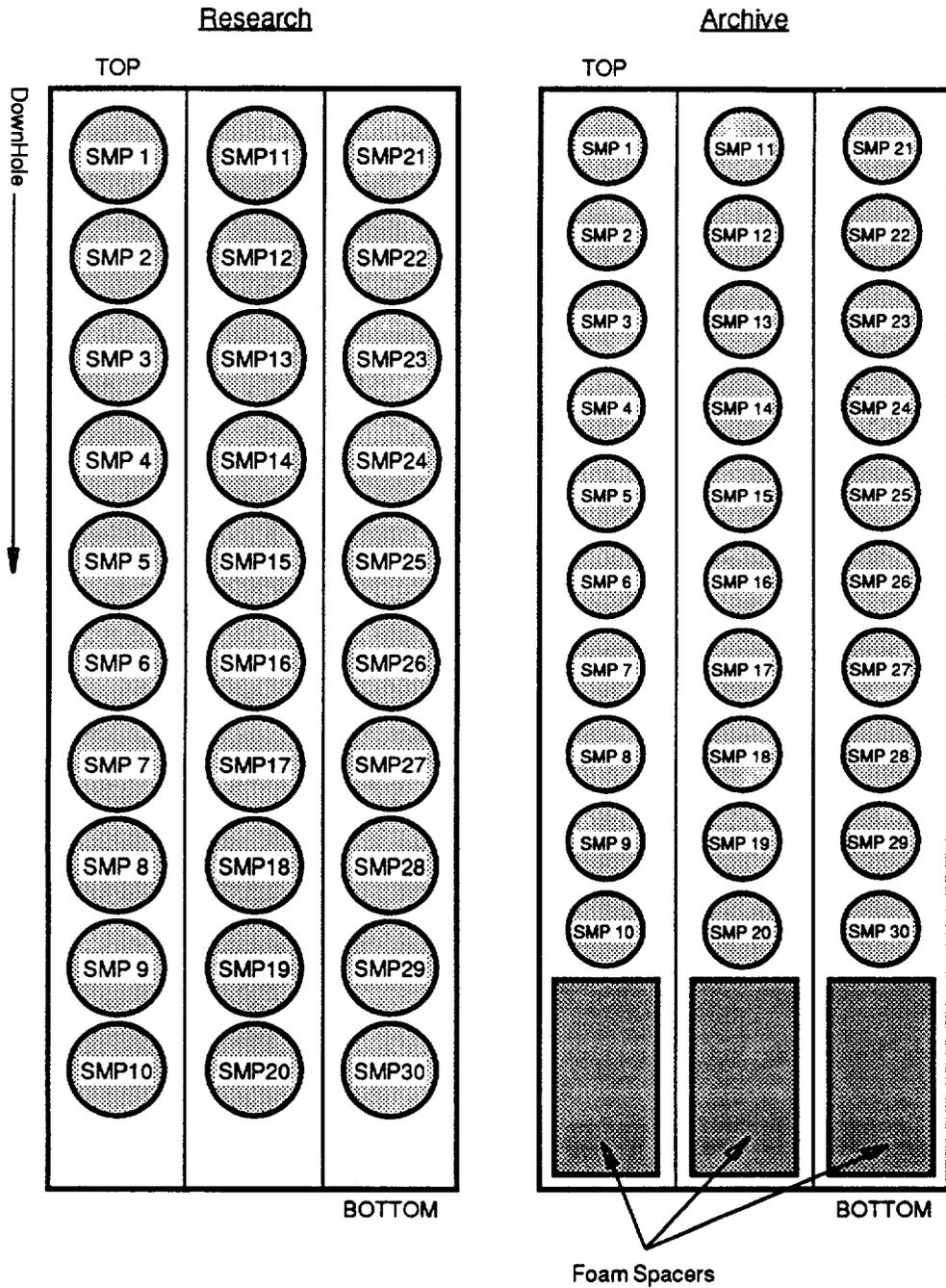
Figure 1 - BTP-SMF-002 Flowchart (continued)

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

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CUTTINGS.0657-15-91

Figure 2 - Arrangement of Split Cuttings Sample in Containers

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

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

Revision:
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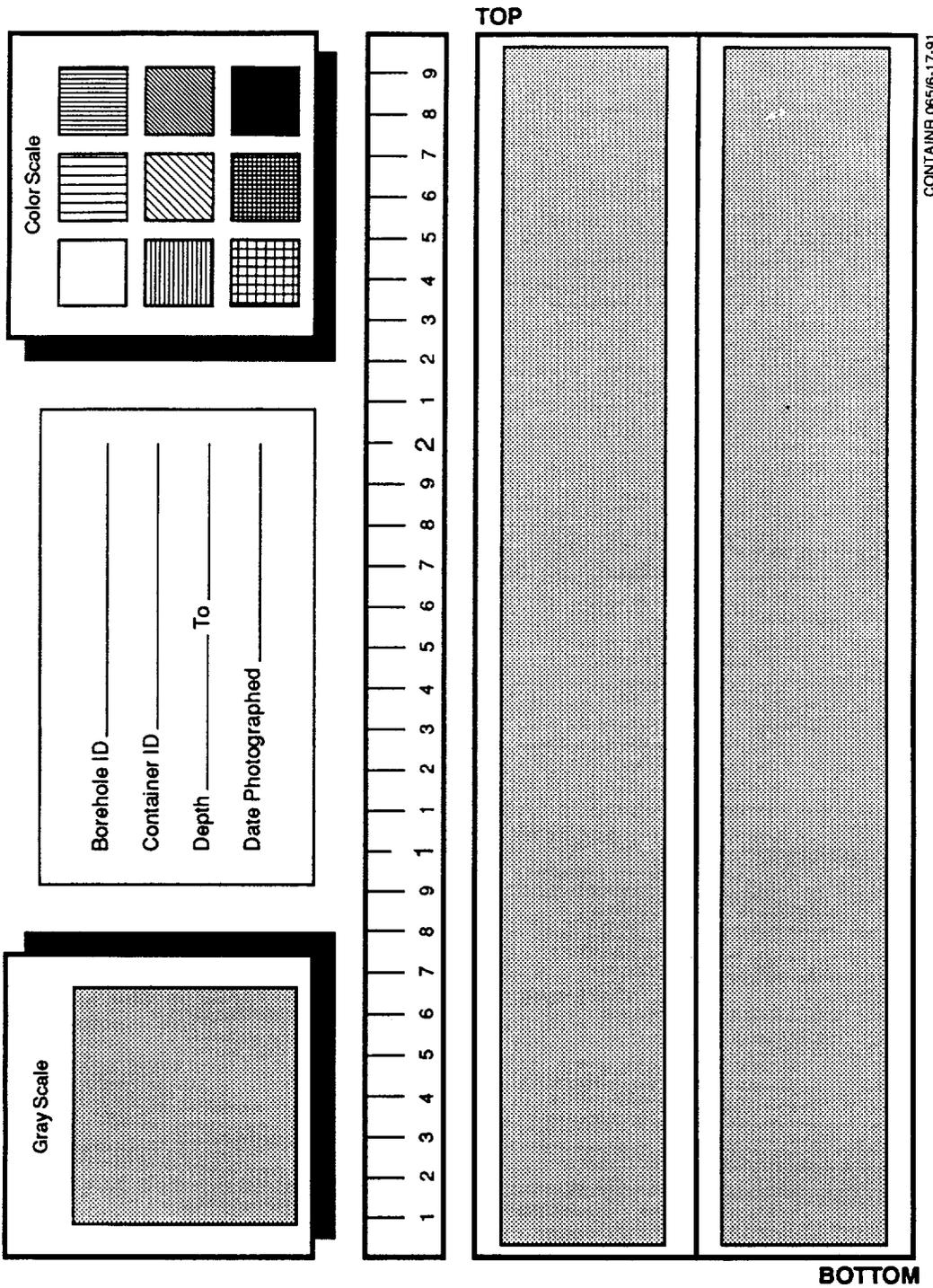


Figure 3 - Sample Container Arrangement for Photography.