

YMP-007-R2
10/28/91**YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT
INTERIM CHANGE NOTICE**ICN No. 1
Page 1 of 1

Title: FIELD LOGGING, HANDLING, AND DOCUMENTING BOREHOLE SAMPLES	Document No.: BTP-SMF-008	Rev. No.: 2	Effective Date: 2/5/92
--	------------------------------	----------------	---------------------------

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

Page 2 of 31, Section 2.0

After Committee (SOC), add "as indicated on form number YMP-055 from AP-6.4Q"

Page 12 of 31, Section 6.2

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

INSTRUCTIONS TO DOCUMENT HOLDERS:

1. Place this ICN Approval Page at the beginning of BTP-SMF-008.
2. Replace the procedure's Page 2 of 31 and Page 12 of 31 with the ICN's
Page 2 of 31 and Page 12 of 31.

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

Clarifications on alternative handling as indicated on CAR YM-92-012.

All signatures listed below constitute procedural compliance. I have read, understood, and complied with Procedure QMP-06-04
Rev. 4, ICN # 1, in accomplishing my responsibilities in this procedure.APPROVAL

PROJECT MANAGER

N/A

N/A

Signature

Date

DIRECTOR OF QUALITY ASSURANCE

N/A

N/A

Signature

Date

(OTHER, AS REQUIRED)

N/A

N/A

Signature

Date

PCB CHIEF
(Minor ICNs only)


Signature

1/30/92

Date

TRAINING REQUIRED

☐ YES ☒ N/ANUMBER OF DAYS REQUIRED FOR TRAINING N/ACOMMENTS: Editorial Clarification, no change to intent


Training Officer/Training Manager

Date

9204170230 920410
PDR WASTE
WM-11 PDR**ENCLOSURE 8**

QMP-06-04

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

Title

BRANCH TECHNICAL PROCEDURE: FIELD LOGGING, HANDLING, AND
DOCUMENTING BOREHOLE SAMPLES

NO. BTP-SMF-008

[X] Q

[] Non Q

APPROVAL

T&MSS Assistant PROJECT MANAGER:	Original	W.V. Macnabb	7/6/89
	signed by	Signature	Date
DIRECTOR OF QUALITY ASSURANCE:		Edwin L. Wilmot	7/7/89
		Signature	Date
YMP Branch Chief (OTHER, AS REQUIRED)	:	Uel S. Clanton	7/6/89
		Signature	Date

REVISION 0 EFFECTIVE DATE: 7/14/89

REVISIONS

		INITIAL AND DATE			
		REVISION 1	REVISION 2	REVISION 3	REVISION 4
PROJECT MANAGER:	E.L. Wilmot		<i>[Signature]</i>		
	10/16/90		7/15/91		
DIRECTOR, QA:	D.G. Horton		<i>[Signature]</i>		
	10/26/90		7-15-90		
YMP Branch Chief (OTHER, AS REQUIRED)	U.S. Clanton		<i>[Signature]</i>		
	10/26/90		7/15/91		
M.B. Blanchard	10/26/90				
EFFECTIVE DATE:	10/26/90		7/15/91		

Complete Revision



Page 1 of 31

TRAINING REQUIRED

☒ YES

☐ N/A

NUMBER OF DAYS REQUIRED FOR TRAINING 1

COMMENTS:

SELF STUDY FOR
PERSONNEL BASELINED
TO MAINTAIN PROCEDURE

[Signature]
TRAINING OFFICER/TRAINING MANAGER

7/15/91
DATE

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT INTERIM CHANGE NOTICE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING, AND DOCUMENTING
BOREHOLE SAMPLES

Rev. No.:
2

ICN No.:
1

Page 2 of 31

1.0 PURPOSE AND SCOPE

This procedure defines the Yucca Mountain Site Characterization Project Office (YMPO) requirements and responsibilities for documentation, handling, lithologic and structural logging, core photography, and packaging of Yucca Mountain Site Characterization Project (YMP) borehole samples and specimens at surface-based borehole sites.

2.0 APPLICABILITY

This procedure applies to Field Operations (FO) staff of the Field Test Control Department (FTCD) documenting, handling, field logging, photographing, and packaging cores and cuttings acquired at YMP surface-based drill sites, exclusive of any samples and specimens requiring alternative handling as directed by the Sample Overview Committee (SOC) as indicated on form YMP-055 in AP-6.4Q.

3.0 DEFINITIONS

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

3.2 CORE RUN

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

3.3 CUTTINGS

Cuttings are chips of rock produced during drilling that are removed from the borehole by circulation of drilling fluids.

3.4 DAILY ACTIVITIES LOG

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

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 3 of 31

3.5 DISCREPANCY

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

3.6 RUBBLE

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

3.7 SAMPLE

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

3.8 SAMPLE OVERVIEW COMMITTEE

The SOC is comprised of representatives from Las Alamos National Laboratory, Lawrence Livermore National Laboratory, Sandia National Laboratories, U.S. Geological Survey, Technical and Management Support Services, YMPO, FTCD, and Quality Assurance (QA). It was formed to ensure a balance between YMP sample needs, acquisition, and use, and the need to curate samples for a long period of time.

3.9 SPECIMEN

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

3.10 UNIQUE IDENTIFIER

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

4.0 RESPONSIBLE PARTIES

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

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 4 of 31

1. FO Manager
2. FO Shift Supervisor (SS)
3. FO Geologist
4. FO Geotechnician
5. FO Administrative Assistant

NOTE: FO Staff may consist of the FO Manager, FO SS, FO Geologist, and/or FO Geotechnician.

5.0 PROCEDURE

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

NOTE: All forms in this procedure shall be filled out as the information becomes available.

NOTE: Activities performed during this procedure will be performed in accordance with YMP Administrative Procedure (AP)-6.2Q, Management and Operations of Sample Handling Activities at Borehole Sites.

RESPONSIBLE PARTY

STEPS

PROCEDURE

INITIAL SAMPLE HANDLING

FO Staff

1. Maintain controlled access to logging trailer by maintaining visual contact, locking, or other means, as necessary. Maintain Field Facility Access Log (Attachment 1), according to instructions on back of log.
2. Determine sample type.
 - a. If cuttings, go to Step 33.
 - b. If core, continue.
3. Take custody of inner barrel and core on drill rig floor. Mark barrel to ensure

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 5 of 31

RESPONSIBLE PARTY

FO Staff

STEPS

PROCEDURE

that core will not be switched end-for-end during transport to logging trailer. Obtain run number and interval from driller or designee. If core is in a solid inner barrel, extrude inner sleeve and mark sleeve, as above.

4. Carry barrel or sleeve to logging trailer. Open barrel or sleeve to expose core. Fill out polystyrene foam (foam) Run Marker with run number and interval, and place it at top of core run. Fill out foam Information Markers and place them appropriately in sleeve, as necessary.

INITIAL VIDEOTAPING OF CORE

5. Place scale marked in 0.1-foot intervals and annotated with the borehole ID beside the core. Ensure that:
 - a. Proper cassette is identified and in video camera.
 - b. Markers are legible and visible.
 - c. Camera is securely affixed to camera rack assuring consistent distance to core, and is focused.
 - d. Core is well lighted.
 - e. Camera is set on Record mode.
 - f. Track speed is set correctly.
6. Videotape core run with high-resolution video camera. Complete Field Photographic Log (Attachment 2), according to instructions on back of log.

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008

FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:

2

Page 6 of 31

RESPONSIBLE PARTY

STEPS

PROCEDURE

FO Staff

7. Write following information on videotape cassette: borehole ID, run number(s), dates, tape number, and total footage interval documented by the tape. Lock tape in a cool, dark location until transfer to the FTCD.

REMOVING SPECIMENS

FO Geologist

8. Determine if there are SOC instructions for specimen removal.
 - a. If no, go to Step 10.
 - b. If yes, select specimens to be removed according to SOC instructions and approval.

FO Staff

9. Process specimens:
 - a. Cut foam to length of specimen to be removed and label foam with temporary specimen designation. Remove specimen. Mark all artificial breaks sustained during handling with parallel heavy black lines on both sides of break. Put foam in place of specimen.
 - b. Package specimen according to specifications and approved procedures of Principal Investigator (PI). Label packaging material with temporary designation.

NOTE: Final depth notations will be determined in Step 21.

CORE STAGING

FO Geologist

10. Match top of core to bottom of core from previous run. Fit pieces of core together to reconstruct longer sections of core. Fit rubble zones to represent as nearly as possible their in situ intervals.

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 7 of 31

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
FO Staff	11.	Draw nonorientation marks (*) on both sides of break when the pieces of core cannot be fitted together across the break.
	12.	Mark all artificial breaks sustained during handling with parallel lines on both sides of the break.
	13.	Carefully wipe the core with a dry cloth, if necessary, exercising caution to avoid disturbing unconsolidated zones or rubble.
	14.	Draw short alignment marks perpendicular to and across closely-spaced, parallel breaks, staggered horizontally.
	15.	Use red and blue permanent markers to place parallel orientation stripes on core, red on right, from top to bottom.
FO Geologist	16.	Measure length of core to nearest 0.1 ft (+/- 0.2 ft). Determine if length of core recovered equals length of core cut, for each core run.
	a.	If yes, go to Step 20.
	b.	If no, continue.
	17.	Determine if length of core recovered is greater than length of core cut.
	a.	If yes, reconcile interval with last unrecovered core interval. Then go to Step 20.
	b.	If no, continue.
	18.	Determine unrecovered core interval(s) as follows, after recovering the next run:

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008

FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:

2

Page 8 of 31

RESPONSIBLE PARTY

FO Geologist

STEPS

PROCEDURE

- a. If the bottom of the first run doesn't fit with the top of the second run, place unrecovered core interval at bottom of first run.
 - b. If the bottom of the first run fits with the top of the second run, assign losses to rubble zones, between nonorientation marks, or to other intervals in the run, based on communication with driller, information from rig floor, previous drilling experience in similar rock, etc.
19. Fill out Unrecovered Core Marker and place it at location of unrecovered core, as determined above. Place unrecovered core marks (Ø) on core on both sides of unrecovered interval.
 20. Record amount of core drilled, recovered, and unrecovered on Run Marker and Shift Drilling Summary (Attachment 3), according to instructions on back of summary.
 21. Circumscribe (as much as possible) the core with footage marks at one-foot intervals (carrying depths from previous run). Write depths beside the footage marks. When a footage mark falls within a rubble zone, write depth on an index card and place appropriately.
 22. Determine if specimens have been removed, as described in Steps 8-9.
 - a. If no, go to Step 25.
 - b. If yes, continue.

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 9 of 31

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
FO Geologist	23.	Complete Field Specimen Removal Checklist and Contract (Specimen Contract; Attachment 4), according to instructions on back of contract. Affix duplicates of specimen ID labels to contract and packaging material containing specimen. Fill out Field Specimen Removed Label and affix to foam marker.
	24.	Ship specimen and copy of Specimen Contract to PI/designee, release them directly to PI/designee, or temporarily store at field trailer before shipment to FTCD.

FINAL VIDEOTAPING OF CORE

FO Staff	25.	Videotape staged core as described in Steps 5-7.
----------	-----	--

GEOLOGICAL FIELD LOGGING

FO Geologist	26.	Log structural features on Structural Log (Attachment 5), according to instructions on back of log.
	27.	Log lithologic features on Lithologic Log (Attachment 6), according to instructions on back of log.

REMOVING SPECIMENS

28. Determine if there are SOC instructions for specimen removal.
 - a. If yes, repeat Steps 8b, 9, 23, and 24.
 - b. If no, continue.

PACKAGING AND LABELING CORE

FO Staff	29.	Place waxed cardboard container fitted with foam cradles on core rack, parallel to core. Break core as little as possible to fit in container.
----------	-----	--

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 10 of 31

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
FO Staff	30.	Load core, foam markers, and rubble (bagged in lay-flat tubing and labeled with depth interval and orientation stripes) into container, starting in lower left corner, filling each successive row from left to right.
	31.	Affix labels listing borehole ID, sample type, container ID, and interval of sample in container to downhole end of base and lid of container.
	32.	Seal each container with nylon filament tape.

CUTTINGS HANDLING

FO Geologist	33.	Collect representative cuttings at specified intervals for curation.
	34.	Mark each bag with borehole ID, date, and depth interval. If a sample was not collected, place a marker (with uncollected sample information) in place of uncollected sample.
	35.	Log cuttings lithology as described in Step 27.
	36.	Load cuttings and markers into containers, similar to the method described in Step 30. Label and seal containers as described in Steps 31-32.

TEMPORARY STORAGE OF SAMPLES, SPECIMENS AND FIELD RECORDS

FO STAFF	37.	Temporarily store borehole samples, specimens, and records in access-restricted facility, protected from inclement weather.
----------	-----	---

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 11 of 31

RESPONSIBLE PARTY

STEPS PROCEDURE

SUMMARY REPORTING

- | | |
|--------------|--|
| FO Staff | 38. Maintain DAL. Entries will be legible, concise, in indelible black ink, and initialed. Incoming FO Staff shall read the day's entries and shall initial and date applicable DAL pages. |
| FO Geologist | 39. Complete Shift Drilling Summary (Attachment 3), according to instructions on back of summary. |

RECORDS

- | | |
|----------|--|
| FO Staff | 40. Duplicate all original field records prior to transmittal to the FTCD. |
|----------|--|

MONITORING OF SITE ACTIVITIES

- | | |
|-----|--|
| 41. | Identify discrepancies. Cross through discrepancies, correct original document, and initial and date correction. If correction is not self-explanatory, attach sheet to original describing correction made. |
| 42. | Identify any nonconformances to this procedure and process in accordance with YMPO Quality Management Procedure (QMP)-15-01. |

6.0 REFERENCES

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

6.1 REQUIREMENTS DOCUMENTS

None

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT INTERIM CHANGE NOTICE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING, AND DOCUMENTING
BOREHOLE SAMPLES

Rev. No.:
2

ICN No.:
1

Page 12 of 31

6.2 INTERFACE DOCUMENTS

Project Glossary, YMP/89-15

AP-6.2Q, Management and Operations of Sample Handling Activities at
Borehole Sites

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

QMP-15-01, Control of Nonconformances

7.0 FIGURES AND ATTACHMENTS

Figure 1, BTP-SMF-008 Flowchart

Attachment 1, Field Facility Access Log

Attachment 2, Field Photographic Log

Attachment 3, Shift Drilling Summary

Attachment 4, Field Specimen Removal Checklist and Contract

Attachment 5, Structural Log

Attachment 6, Lithologic Log

8.0 RECORDS

Records packages of documentation generated as a result of this procedure shall be assembled and submitted to the appropriate Local Records Center in accordance with requirements specified in approved procedures. QA records shall be those records so designated by the YMPO during the processes described in this procedure.

The following QA Records are generated by this procedure.

1. Field Facility Access Log
2. Field Photographic Log.
3. Shift Drilling Summary.
4. Field Specimen Removal Checklist and Contract
5. Structural Log

YMP-053-R0
7/12/91

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008

FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:

2

Page 13 of 31

6. Lithologic Log.
7. DAL
8. Core videotape

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 14 of 31

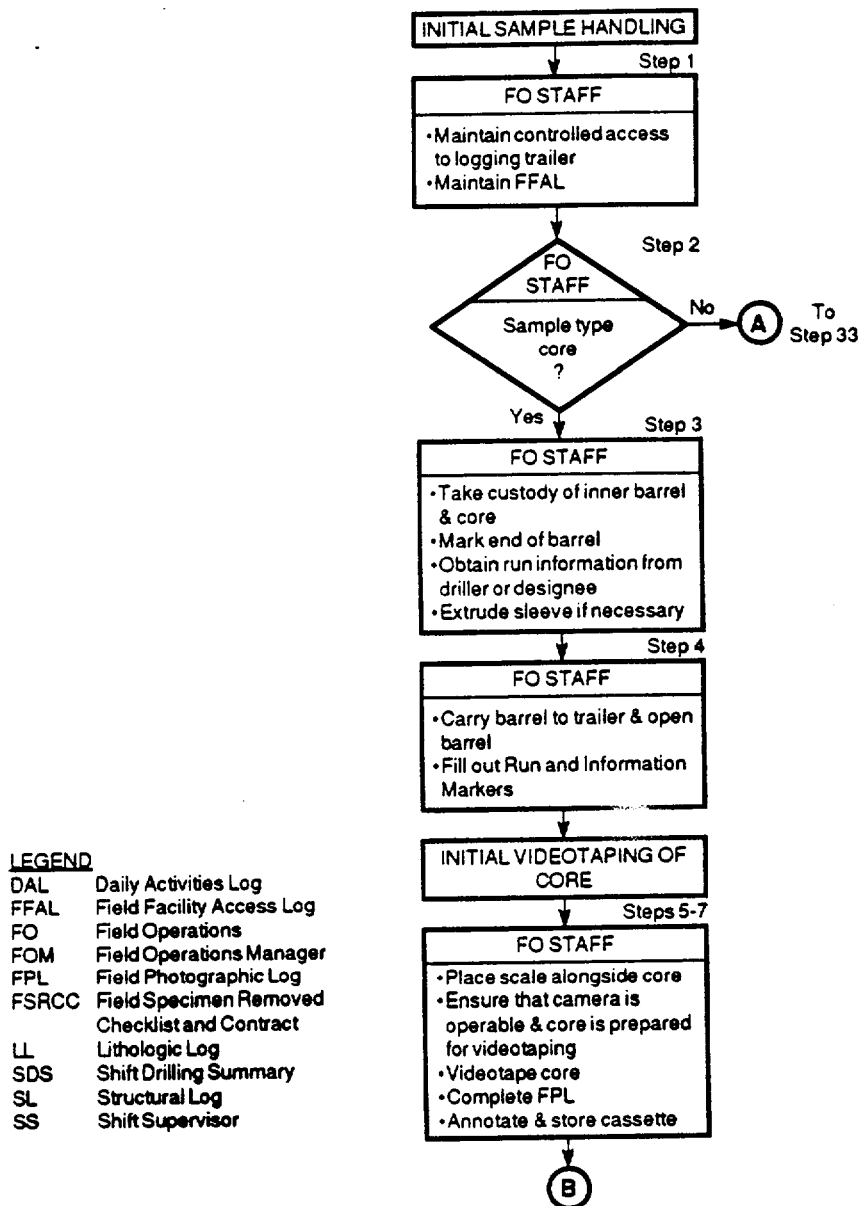


Figure 1 - BTP-SMF-008 Flowchart

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 15 of 31

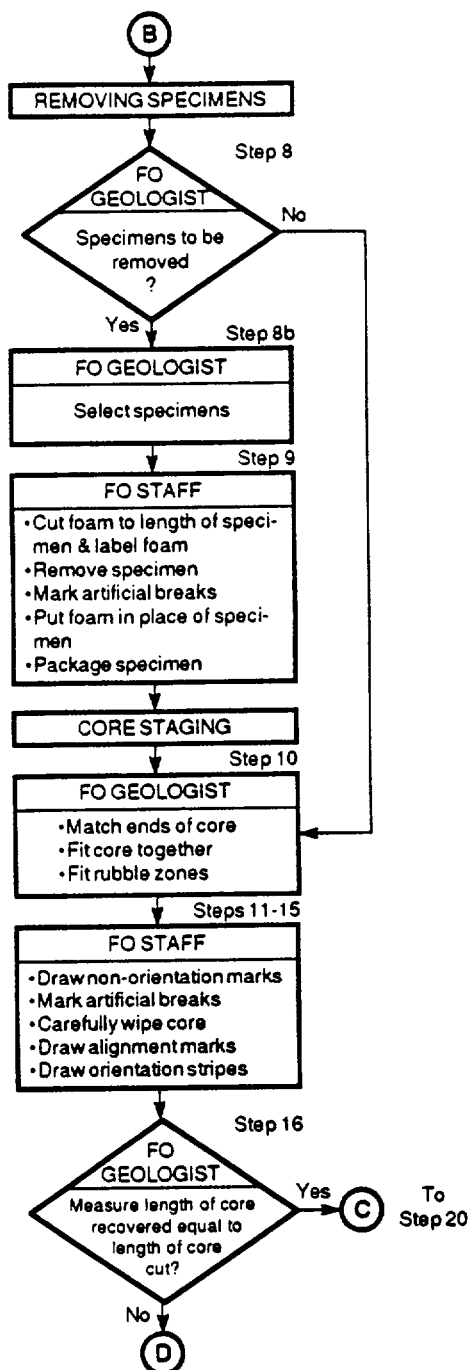


Figure 1 - BTP-SMF-008 Flowchart (continued)

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 16 of 31

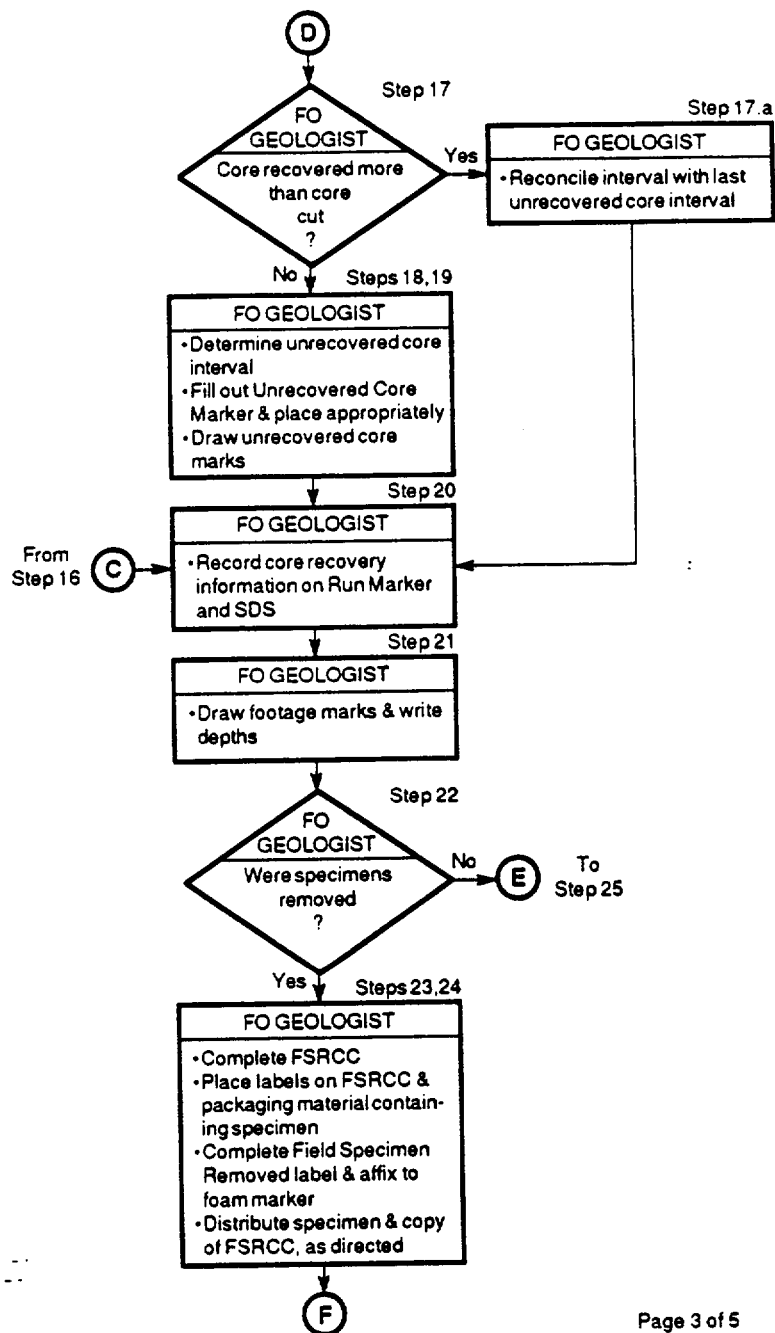


Figure 1 - BTP-SMF-008 Flowchart (continued)

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 17 of 31

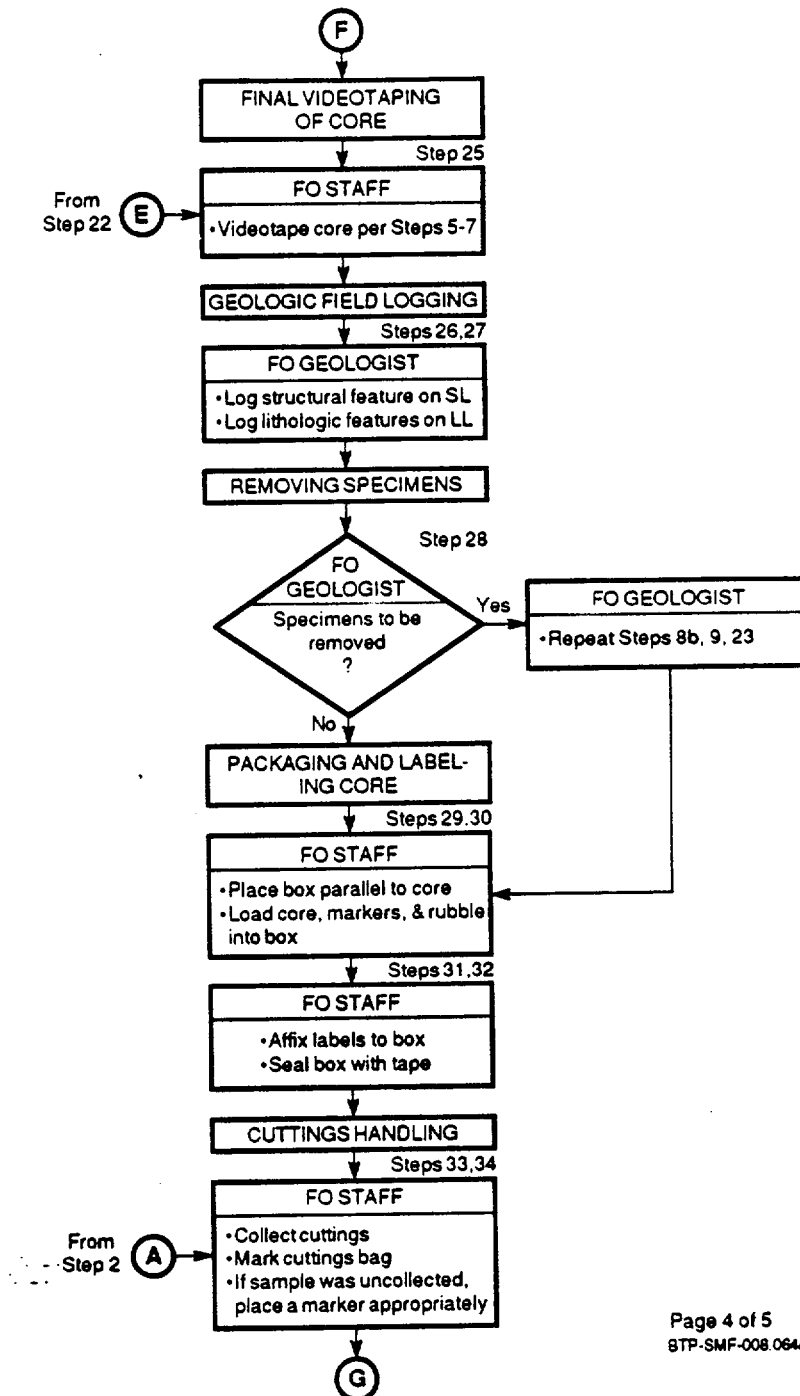


Figure 1 - BTP-SMF-008 Flowchart (continued)

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 18 of 31

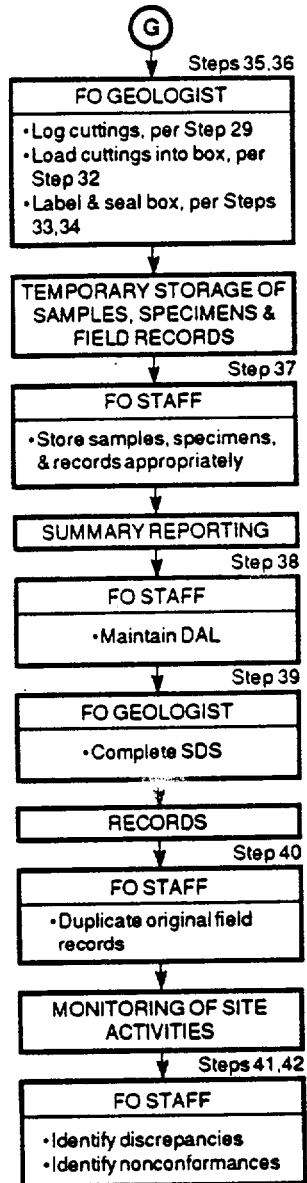


Figure 1 - BTP-SMF-008 Flowchart (continued)

YMP-053-R0
7/12/91

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 19 of 31

YMP-013-R0
4/17/91
WBS: _____
QA: _____

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

Borehole ID # _____

Page _____ of _____

Shift Start Date _____ Shift Time _____ (0000 - 2400 clock)

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

BTP-SMF-008

Attachment 1 - Field Facility Access Log

YMP-053-R0
7/12/91

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 20 of 31

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

HEADER INFORMATION

Borehole ID # Unique alphanumeric designation assigned to borehole

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

Shift Start Date Date shift starts

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

COLUMN INFORMATION

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

Organization Organization of individual

Purpose of Visit Brief description of purpose of visit

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

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Page 21 of 31

[illegible]

BTP-SMF-008

Attachment 2 - Field Photographic Log

YMP-053-R0
7/12/91

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 22 of 31

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

HEADER INFORMATION

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

COLUMN INFORMATION

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

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Revision:
2

Page 23 of 31

INSTRUCTIONS ATTACHED

BTP-SMF-008

Attachment 3 - Shift Drilling Summary

YMP-053-R0
7/12/91

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 24 of 31

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

HEADER INFORMATION

<u>Borehole ID #</u>	Unique alphanumeric designation assigned to each borehole
<u>Drilled Interval</u>	Total interval drilled during shift
<u>Pagination</u>	Number sequentially assigned to sheets; first blank contains number of that particular sheet; second blank contains total number of sheets for the shift
<u>Shift Start Date</u>	Date of beginning of shift
<u>Shift Time</u>	Expressed in 24-hour timeclock (0000 - 2400 hrs)
<u>Completed by/Date</u>	FO Geologist's signature and date
<u>Checked by/Date</u>	FO Staff not directly responsible for completion of form

SUMMARY OF ACTIVITIES

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

GEOLOGIC INFORMATION

Provide gross lithologic description and structural information.

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

<u>#</u>	Run number
<u>Interval</u>	Depth interval of run
<u>Cut</u>	Amount of footage cut during run, as reported by driller
<u>Recovered</u>	Amount of core recovered from run
<u>Unrecovered</u>	Amount of core unrecovered from run
<u>Unrecovered Interval</u>	Depth interval(s) of each unrecovered interval of core from run (if applicable)
<u>% Recovered</u>	Total percent of core unrecovered from run
<u>Verified By</u>	FO Staff not directly responsible for completion of this form; verify for each run; verify "Totals" in lower right-hand block
<u>Total</u>	Totals of "cut", "recovered", and "unrecovered" columns; calculate % recovery

YMP-053-R0
7/12/91

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 25 of 31

YMP-010-R0
4/17/91
WBS: _____
QA: _____

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY FIELD SPECIMEN REMOVAL CHECKLIST AND CONTRACT

Recipient _____ Address _____
Organization _____
Telephone () _____ (FTS) _____
Courier _____

By _____ Date _____ Borehole ID _____
RSED Director Authorization _____ Page _____ of _____

SPECIMEN INFORMATION			CHECKLIST		
Specimen Number	Affixed?	Interval Removed	Foam Mkr?	Mkd/ Tag?	Pkgd? Desc.
		Date Created			

SPECIMEN TRANSFER

Person Releasing Custody:

Person Accepting Custody:

Date/Time _____

Date/Time _____

SMF
Use
Only

Checked By _____

Date _____

INSTRUCTIONS ATTACHED

BTP-SMF-008

Attachment 4 - Field Specimen Removal Checklist and Contract

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 26 of 31

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

HEADER INFORMATION

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

SPECIMEN/CHECKLIST INFORMATION:

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

SPECIMEN TRANSFER

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

Page 27 of 31

BTP-SMF-008

YMP-053-FO
7/12/91

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 28 of 31

INSTRUCTIONS FOR PREPARATION OF YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY STRUCTURAL LOG

HEADER INFORMATION

Borehole ID Unique alphanumeric designation given to borehole

From/To First and last core depths from Columns 3-7

Core Diameter Diameter of core; begin new sheet with new diameter

Inclination/Bearing Inclination: degrees from vertical; bearing: 360° azimuthal bearing; does not relate to natural drift of hole; enter "NA" if vertical hole

Pagination Numbers sequentially assigned to sheets; first blank contains number of individual sheet; second blank contains total number of sheets, filled in upon completion of borehole

Geologist(s)/Date(s) Signature(s)/date(s) of Geologist(s) completing form

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

COLUMN INFORMATION [Note: Column number in ()]

Nonorientation marks (1)

Bracket /-X (2) Enter "/" and "X" to delineate run depths, zones of similar fracturing or breakage, core losses, intervals of rubble, significant void intervals, fracture lengths > 0.5 ft, and intervals of removed specimens. Enter "/" beside top depth of zone and "X" on next row beside bottom depth of zone. Leave blank for single features that occur at a particular depth. Always enter "/" and "X" of individual bracket on same page.

Depth (3-7) Enter to nearest 0.1 ft; locate fractures at mid-point

Frac. Origin (8) Use following codes for origin of break or feature:

N: Natural; best recognized by mineralization	H: Handling-induced; further description not necessary
C: Coring-induced; fresh, clean, tightly fitting	I: Indeterminate; cannot determine origin

Bracket Code (9-10) Identifies features bracketed in Column 2:

UC: Unrecovered core	VI: Void interval
WC: Whole core removed	FZ: Fracture zone
RZ: Rubble zone	FL: Fracture length - fracs w/ length \geq 0.5 ft

INSTRUCTIONS FOR PREPARATION OF
YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT
SAMPLE MANAGEMENT FACILITY
STRUCTURAL LOG
(continued)

Numeric Value (11-14) Each bracket code has a numeric value:

for UC, WC: Length of interval to nearest 0.1 ft
for RZ: Average maximum length of rubble pieces to nearest 0.01 ft
for FZ: Average spacing between breaks to nearest 0.01 ft
for FL: Measured length of fracture to nearest 0.01 ft
for VI: Estimated volume percent of voids in that interval

Orientation (15-18) Relation of fracture to orientation stripes; A1, A2; B1, B2; C1, C2; D1, D2; if fracture has 0° or 90° dip or does not transect core, slash Columns 14-17

Dip (19-20) Angle between plane normal to axis of core and plane of feature, expressed in (°)

Fracture Description (21-22) Alphanumeric code to describe fracture; use a letter (Column 21) and a number (Column 22):
A - continuous 1 - open 3 - partly open/partly healed
B - discontinuous 2 - healed 4 - hairline

Fracture line (23) Enter following codes:
1 - planar 2 - irregular 3 - curved 4 - undulatory

Surface Characteristics (24) Enter following codes:
1 - smooth/polished 2 - irregular 3 - curved 4 - undulatory

Tectonic features (25-26) Enter following codes; slash if no tectonic
Features noted:
SR: Solution removal of matrix ON: Offset normal CO: Offset oblique
SS: Slickensides OP: Offset parallel

Secondary Mineralization (27-36) Enter "X" in appropriate column; describe "Other" in Remarks

Weathered (37) Enter "X" if condition noted

Piece Length (38-41) Enter length of core ≥ 0.35 ft between natural and/or indeterminate breaks, in same row as lowermost break. Piece lengths are measured between midpoints of fractures

Remarks Enter core conditions, mineralization, etc.

YMP-053-R0
7/12/91

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 30 of 31

YMP-009-R0
4/17/91
WBS: _____
QA: _____

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY LITHOLOGIC LOG

Borehole ID _____ Type _____ From _____ To _____ Page _____ of _____
By _____ Date(s) _____ Checked By _____ Date _____

DESCRIPTION

INSTRUCTIONS ATTACHED

BTP-SMF-008

Attachment 6 - Lithologic Log

YMP-053-R0
7/12/91

YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT PROCEDURE

Procedure No.: BTP-SMF-008
FIELD LOGGING, HANDLING AND DOCUMENTING BOREHOLE
SAMPLES

Revision:
2

Page 31 of 31

INSTRUCTIONS FOR PREPARATION OF YUCCA MOUNTAIN SITE CHARACTERIZATION PROJECT SAMPLE MANAGEMENT FACILITY LITHOLOGIC LOG YMP-009

HEADER INFORMATION

Borehole ID # Unique alphanumeric designation assigned to borehole

Type Indicate core or cuttings

From/To Represents the interval documented on individual sheet

Pagination Numbers sequentially assigned to sheets; first blank contains number of individual sheet; second blank contains total number of sheets, filled in after completion of borehole

By/Date(s) FO Geologist's signature and date

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

DESCRIPTION INFORMATION

Record lithologic description of rock, as well as accepted geologic formation and/or member names, if known. Record depths in feet to nearest 0.1 ft. Use charts, tables, and other references to describe features in consistent manner, as described below:

Primary Descriptive Terms Note for lithologic units, in following order:

Unit
Type
Color
Welding
Vitrification

General Features Characteristics of entire unit interval; estimate % volumes (volumetric proportions), when applicable; describe general features in following order, when present:

Pumice
Lithic fragments
Phenocrysts
Lithophysae
Unit contact

Specific Features Characteristics of zone within unit interval; isolated, localized features not common throughout unit; locate by depth

YUCCA MOUNTAIN PROJECT OFFICE DOCUMENT APPROVAL SHEET

Y-AD-002
1/22/91

Title
BRANCH TECHNICAL PROCEDURE: GAMMA-RAY LOGGING OF YUCCA MOUNTAIN
PROJECT CORE

NO. BTP-SMF-010
[X] Q
[] Non Q

APPROVAL

PROJECT MANAGER:

[Signature]
Signature

3/5/91

Date

DIRECTOR OF QUALITY ASSURANCE:

[Signature]
Signature

3/1/91

Date

Uel S. Clanton
(OTHER, AS REQUIRED)
YMP Branch Chief

[Signature]
Signature

Feb. 28, 1991

Date

REVISION 0 EFFECTIVE DATE:

3/20/91

3/14/91

REVISIONS

INITIAL AND DATE

REVISION 1

REVISION 2

REVISION 3

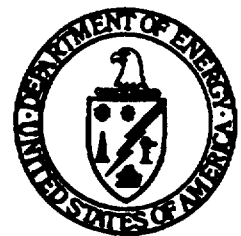
REVISION 4

PROJECT MANAGER:

DIRECTOR, QA:

(OTHER, AS REQUIRED)

EFFECTIVE DATE:



Page 1 of 9

TRAINING REQUIRED

☐ YES☒ N/A

NUMBER OF DAYS REQUIRED FOR TRAINING

N/A

COMMENTS:

TRAINING WILL BE AFFORDED WHEN ASSIGNED
BY MANAGEMENT

[Signature]
TRAINING OFFICER/TRAINING MANAGER

3/6/91
DATE

9112020176 988

ENCLOSURE 9

YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001
8/90

Procedure No.: BTP-SMF-010
GAMMA-RAY LOGGING OF YUCCA MOUNTAIN
PROJECT CORE

Revision:
0

Page 2 of 9

1.0 PURPOSE AND SCOPE

The purpose of this procedure is to produce a gamma-ray log of the core stored at the Yucca Mountain Site Characterization Project (Project) Sample Management Facility (SMF), which can be compared to the gamma-ray logs run in the borehole.

2.0 APPLICABILITY

This procedure applies to existing Project core that was drilled prior to the implementation of the Yucca Mountain Site Characterization Project Office (Project Office) Quality Assurance (QA) Program Plan (YMP/88-9) and any core drilled subsequent to implementation of YMP/88-9 has subsequently been replaced by Office of Civilian Radioactive Waste Management (OCRWM) Quality Assurance Program Description Document. This procedure applies exclusively to those Sample Management (SM) staff assisting in the implementation of this procedure as directed by the SMF Curator.

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 SAMPLE MANAGEMENT

SM of the Technical and Management Support Services (T&MSS) contractor is the organization responsible for reprocessing activities. SM staff consists of management and operations personnel who ensure that SM operations and documentation satisfy applicable regulatory requirements. Reynolds Electrical and Engineering Co., Inc., shall assist the SMF staff in a craft support role as needed.

3.2 SAMPLE MANAGEMENT FACILITY

The SMF consists of a physical facility and equipment designed to effectively process and preserve geologic and other samples. The SMF is operated by T&MSS contractor personnel for the Project. The SMF Curator administers daily operations and activities at the SMF, and the SMF Geologist directs and performs daily processing activities, with support from the SMF Geotechnician. Core will be gamma scanned in a restricted area of the SMF.

3.3 EXISTING (UNQUALIFIED) SAMPLES

Existing (unqualified) samples are those cores that were collected for the Project prior to implementation of the YMP/88-9 and applicable, approved implementing procedures. Samples will be considered unqualified until they

YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001
8/90

Procedure No.: BTP-SMF-010
GAMMA-RAY LOGGING OF YUCCA MOUNTAIN
PROJECT CORE

Revision:
0

Page 3 of 9

have been qualified by the process described in Project Administrative Procedure (AP)-5.9Q. Data from qualified samples may be used as primary data in reports supporting licensing documents.

3.4 LOST CORE BLOCK

A lost core block indicates an interval of core that was not recovered.

3.5 CORE INFORMATION PACKAGE

A core information package is prepared by SMF staff during reprocessing. These packages may include, but are not limited to, lithologic logs, geophysical logs, oriented and wax core logs, geolograph records, Participant sample collection and disposition records, and core gamma scanner logs. Also included are the QA records generated by this procedure.

3.6 CORE GAMMA-RAY SCANNER

A core gamma-ray scanner is a machine that detects and records the total gamma-rays emitted by the minerals in the core.

3.7 CORE GAMMA-RAY LOG

The gamma-ray log is a plot of the total gamma counts versus the depth of the core.

3.8 DISCREPANCY

A discrepancy exists when there is incorrect information that significantly affects documentation or notation and that is beyond the scope of the immediate activity or form being completed.

3.9 NONCONFORMANCE

A nonconformance exists when there is a deficiency in characteristics, documentation, or procedures that renders the quality of an item or activity unacceptable or indeterminate. 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.

4.0 RESPONSIBLE PARTIES

The SMF staff is responsible for the implementation of this procedure as defined and outlined in Section 5.0. The support staff to the SMF Curator includes the following individuals:

YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001
8/90

Procedure No.: BTP-SMF-010
GAMMA-RAY LOGGING OF YUCCA MOUNTAIN
PROJECT CORE

Revision:
0

Page 4 of 9

1. Chief, Site Investigation Branch (SIB)
2. SMF Geologist
3. SMF Geotechnician
4. SMF Technical Staff Assistant
5. SMF 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>
Chief, SIB	1.	Notify the SMF Curator of request to scan an interval of core.
SMF Curator	2.	Notify the SMF staff which cores will be gamma-scanned.
SMF Staff	3.	Place the core into the polyvinyl chloride (PVC) half-tube, ensuring that fit is maintained.
	NOTE:	The half-tube should be marked at one end to indicate top depth.
	NOTE:	In the event of core loss intervals, specimens, or other intervals of removed or missing core, measure the correct amount of space to the beginning of the next piece of core.
	a.	Mark the location of the end of the box and each row.
	b.	Repeat Step 3 as required until desired interval of core has been scanned.
	4.	Standardize the gamma scanner at the beginning and end of each day or when boreholes are changed.

YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001
8/90

Procedure No.: BTP-SMF-010
GAMMA-RAY LOGGING OF YUCCA MOUNTAIN
PROJECT CORE

Revision: 0

Page 5 of 9

RESPONSIBLE PARTY

SMF Staff

STEPS

PROCEDURE

a. Start the gamma scanner and run with nothing in the detector for five to ten minutes. This is the background count.

b. Place a rock specimen into the gamma scanner using the bracket to hold the rock stationary over the detector and record for five to ten minutes. The rock used should produce a total count approximately two times greater than background.

5. Perform gamma scan of core using operating instructions by the manufacturer.

NOTE: The system is menu driven. However, a hard copy of the operating instructions is kept with the gamma scanner. The equipment used to gamma scan the core may include, but is not limited to, a Harbert Engineering single channel Core Gamma-Ray Scanner.

6. Return core to box as it exits the gamma scanner.

7. Return core to storage location and continue processing core until interval is complete.

8. Submit a floppy disk with gamma scanner files and a hard copy of the information (including log printout and data file) to the Administrative Assistant when the borehole or requested interval is complete.

NOTE: SMF staff completing scan should initial and date hard copy of the log and the data file.

9. Identify a discrepancy that results from the actions of the SMF staff using this procedure.

YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001
8/90

Procedure No.: BTP-SMF-010
GAMMA-RAY LOGGING OF YUCCA MOUNTAIN
PROJECT CORE

Revision:
0

Page 6 of 9

<u>RESPONSIBLE PARTY</u>	<u>STEPS</u>	<u>PROCEDURE</u>
SMF Staff	10.	Is the discrepancy discovered after an activity or form has been completed?
	a.	If yes, handle according to BTP-SMF-001.
	b.	If no, go to next step.
	11.	Cross through the error, correct the original document, and initial and date the correction.
	NOTE:	If additional explanation is required, assign a number to the correction and attach a sheet to the original record describing the correction performed.
	12.	Identify any nonconformance to this procedure, process in accordance with QMP-15-01.
	NOTE:	This is applicable for nonconformances noted during or after activities associated with this procedure.
Administrative Assistant	13.	Submit records to Local Records Center (LRC) according to QMP-17-01.
	14.	Submit copy of records to the Chief, SIB.

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

YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001
8/90

Procedure No.: BTP-SMF-010
GAMMA-RAY LOGGING OF YUCCA MOUNTAIN
PROJECT CORE

Revision: 0

Page 7 of 9

6.2 INTERFACE DOCUMENTS

Project Glossary, YMP/89-15

AP-5.9Q, Qualification of Existing Data or Data Interpretation Not
Developed under the Nevada Nuclear Waste Storage Investigation QA Plan

QMP-15-01, Control of Nonconformances

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

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

BTP-SMF-004, Physical Processing and Storage of Core and Cuttings at the
Sample Management Facility

Harbert Engineering Operations Manual, Instructions for the Core
Gamma-Ray Logger

7.0 FIGURES AND ATTACHMENTS

Figure 1, Gamma-Ray Logging Flowchart

8.0 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 every 10 business days:

Core Gamma-Ray Log

A copy of the QA records will be retained by the SMF and stored at the
SMF Documents Center.

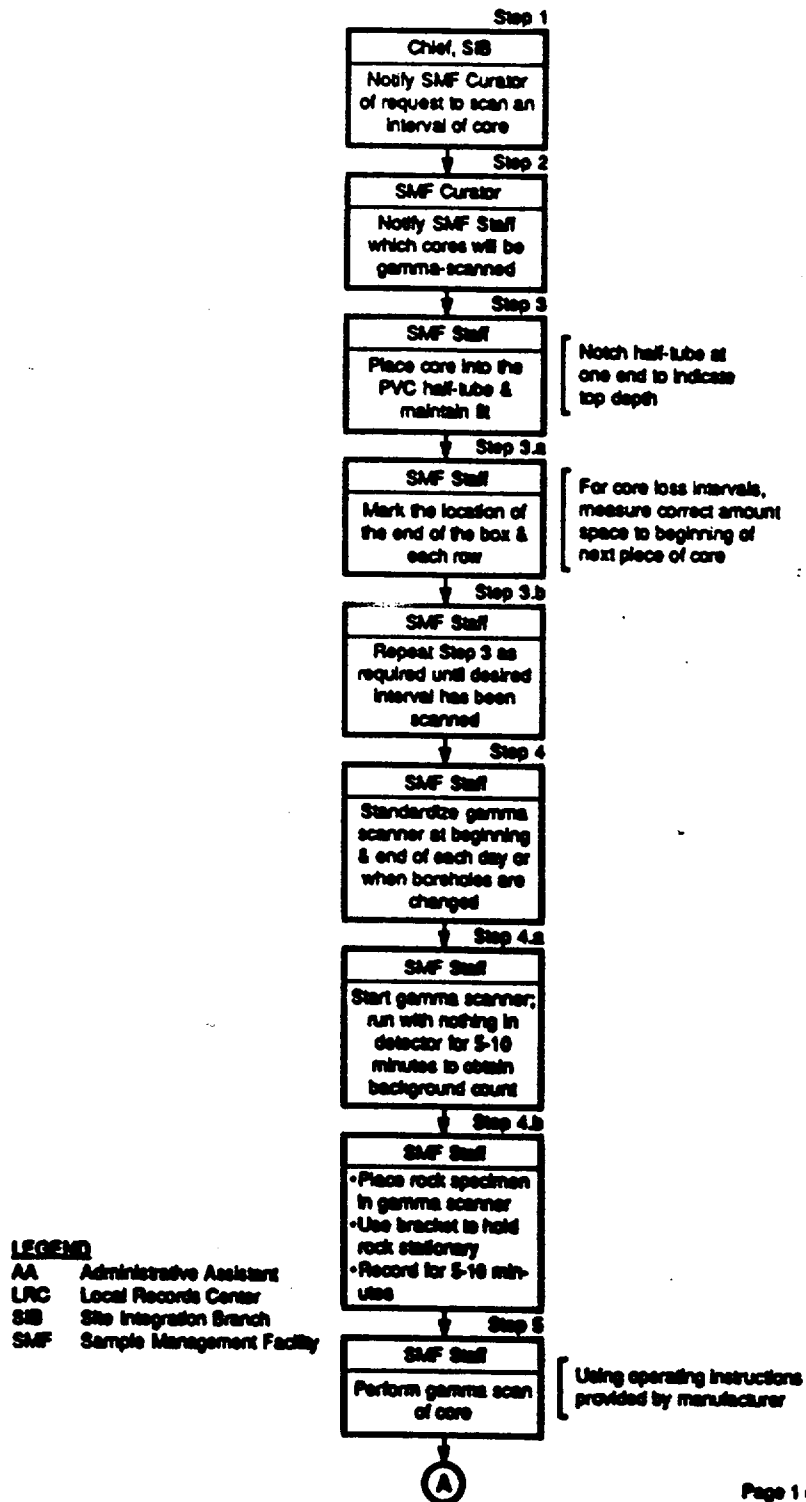
YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001
8/90

Procedure No.: BTP-SMF-010
GAMMA-RAY LOGGING OF YUCCA MOUNTAIN
PROJECT CORE

Revision: 0

Page 8 of 9



Page 1 of 2
BTP-SMF-010.0548-1-01

Figure 1 - BTP-SMF-010 Flowchart

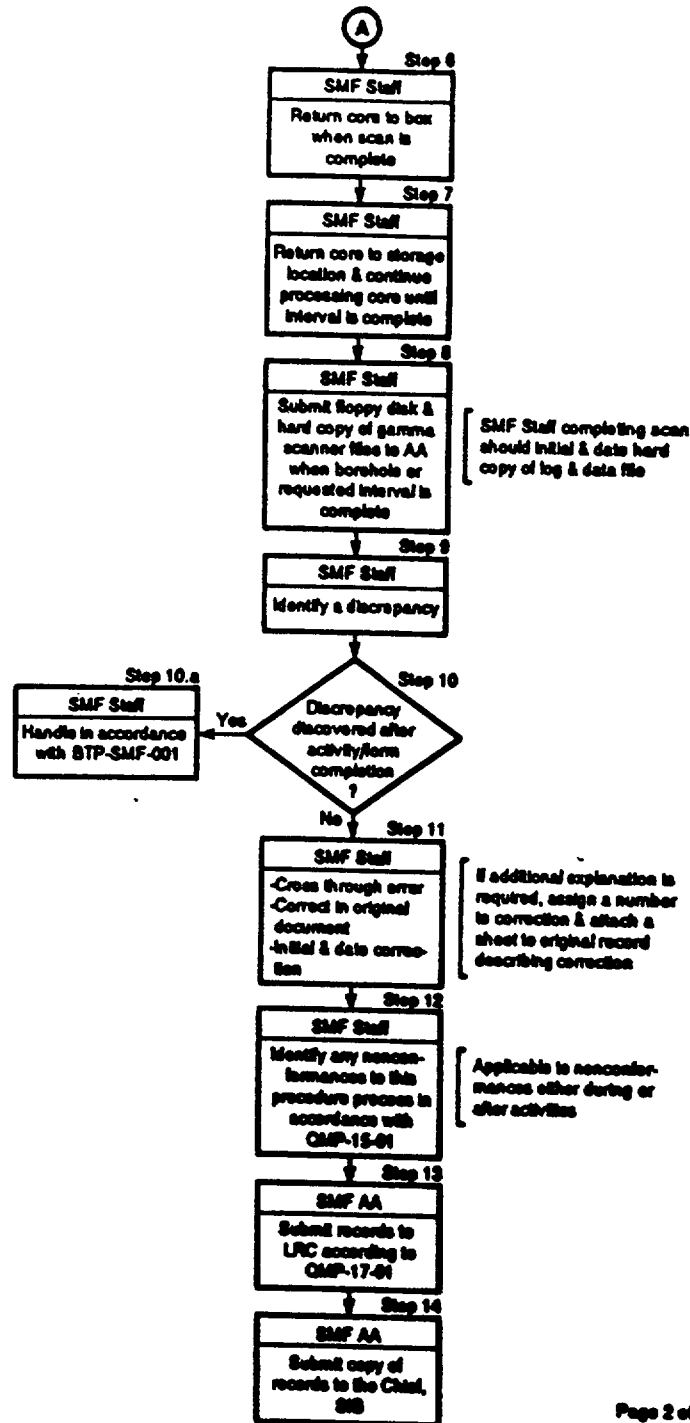
YUCCA MOUNTAIN PROJECT PROCEDURE

Y-AD-001
8/90

Procedure No.: BTP-SMF-010
GAMMA-RAY LOGGING OF YUCCA MOUNTAIN
PROJECT CORE

Revision: 0

Page 9 of 9



Page 2 of 2
BTP-SMF-010.0 548-4-01

Figure 1 - BTP-SMF-010 Flowchart (continued)