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Document #: SD-CP-TP-087

Title/Desc:

ROCKY FLATS ASH TEST PROCEDURE SLUDGE
STABILIZATION

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN No 617497

Proj.
ECN

2. ECN Category (mark one) Supplemental ☐ Direct Revision ☒ Change ECN ☐ Temporary ☐ Standby ☐ Supersedure ☐ Cancel/Void ☐	3. Originator's Name, Organization, MSIN, and Telephone No. ML Winstead, 15530, T5-55, 373-6333 5. Project Title/No./Work Order No. HC-21C/15530 8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-CP-TP-087, Rev. 0	3a. USQ Required? ☐ Yes ☒ No 6. Bldg./Sys./Fac. No. 234-5Z/73T/2Z 9. Related ECN No(s). NONE	4. Date 9-6-95 7. Approval Designator Q 10. Related PO No. NONE
11a. Modification Work ☐ Yes (fill out Blk. 11b) ☒ No (NA Blks. 11b, 11c, 11d)	11b. Work Package No. N/A	11c. Modification Work Complete N/A Cog. Engineer Signature & Date	11d. Restored to Original Condition (Temp. or Standby ECN only) N/A Cog. Engineer Signature & Date
12. Description of Change Add an additional task to record information on weight change of processed material exposed to the glovebox atmosphere over a period of time.			
13a. Justification (mark one) Criteria Change ☒ Design Improvement ☐ Environmental ☐ Facility Deactivation ☐ As-Found ☐ Facilitate Const ☐ Const. Error/Omission ☐ Design Error/Omission ☐			
13b. Justification Details Data is needed to ensure the stability of the material when handled in the glovebox atmosphere and not placed in the desiccator. No Unreviewed Safety Question exists. USQ 95-19 applies to this ECN.			
14. Distribution (include name, MSIN, and no. of copies) See Distribution Sheet			RELEASE STAMP OFFICIAL RELEASE BY WHC DATE SEP 18 1995 Sta 5

617497

18. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 12. Enter the affected document number in Block 19.

19. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number Revision

20. Approvals

Date _____

Signature

Date _____

OPERATIONS AND ENGINEERING

ARCHITECT-ENGINEER

Cog. Eng.

9/8/95

PE

Cog. Mgr.

44712
01259

QA

QA

9-18-95

Safety

Safety

Design

Environ.

1

Environ.

Other

Other

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

RELEASE AUTHORIZATION

Document Number: WHC-SD-CP-TP-087, REV 1

Document Title: Rocky Flat Ash Test Procedure (Sludge Stabilization)

Release Date: 9/14/95

**This document was reviewed following the
procedures described in WHC-CM-3-4 and is:**

APPROVED FOR PUBLIC RELEASE

WHC Information Release Administration Specialist:

Kara M. Broz

9/14/95

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SUPPORTING DOCUMENT

1. Total Pages

10

2. Title

Rocky Flats Ash Test Procedure (Sludge
Stabilization)

3. Number

WHC-SD-CP-TP-087

4. Rev No.

1

5. Key Words

Rocky Flats Ash, HC-21C, Furnaces

6. Author

Name: M. L. Winstead

M. L. Winstead
Signature

Organization/Charge Code 15530/K6018

7. Abstract

Document provides instructions for testing Rocky Flats Ash in the HC-21C muffle furnace process.

8. RELEASE STAMP

RECORD OF REVISION		(1) Document Number	Page 1
(2) Title Rocky Flats Ash Test Procedure (Sludge Stabilization)			
CHANGE CONTROL RECORD			
(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
	(7)	(5) Cog. Engr.	(6) Cog. Mgr. Date
0	Revision 0 was released on June 14, 1995, by EDT # 155832.		
RS 1	Revision 1 broadens the scope of the test plan which includes testing the stabilized material in the glovebox atmosphere to see how it affects the material. (ECN # 617497)	U.L. Winstead 9/14/95	mn J. J. J. 9/14/95

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1. TEST ITEM IDENTIFICATION

Rocky Flats Ash items have been identified as the next set of materials to be stabilized. This test is being run to determine charge sizes and soak times to completely stabilize the Rocky Flats Ash items. The information gathered will be used to generate the heating rampup cycle for stabilization. This test will also gain information on the effects of the glovebox atmosphere (moisture) on the stabilized material.

2. GENERAL DESCRIPTION

2.1 Test Objective

This test will provide information to determine charge sizes, soak times and mesh screen sizes (if available at time of test) for stabilization of Rocky Flats Ash items to be processed in the HC-21C Muffle Furnace Process. Once the charge size and soak times have been established, a program for the temperature controller of the HC-21C Muffle Furnace Process will be generated for processing Rocky Flats Ash.

This test will also provide information on the effectiveness of the heat treatment of material when exposed to moisture from the glovebox atmosphere and what effects the glovebox atmosphere has on stabilized ash.

2.2 Test Method

The process test will include heating individual 500 gram charges of Rocky Flats Ash to 1000°C for 1, 2, 3, or 4 hours with or without a mesh screen over the charge to prevent lofting. After each charge has completed its run of 1, 2, or 3 hours, a Loss-On-Ignition (LOI) test will be done to determine if the soak time was long enough (LOI < 1% is acceptable). If a acceptable LOI is not reached after running the 500 gram charge for 1, 2, 3, or 4 hours, the same test will be run using a 400 gram charge. This results in eight test furnace charges. Further test charges may be run at the direction of the test engineer within the limits of a maximum 500 grams per charge.

3. TEST CONDITION LIMITS

Furnace or furnaces are operating.

4. INSTRUMENTS

Electronic Scale, Thermocouple readout.

5. FACILITIES, EQUIPMENTS, AND MATERIALS

The furnaces located in glovebox HC-21C in room 230-A will be used to perform the Rocky Flats Ash material tests. A mesh screen will be used on top of the boat to help prevent lofting of the material (this was noticed as a slight problem during the previous stabilization campaign). Also, the electronic scale, sieve trays and mortar and pestle in glovebox HC-21A in room 230-B will be used. This equipment is part of sludge stabilization process equipment.

6. SAFETY

All individuals involved in performing this procedure are required to read, understand and comply with the applicable RWP that governs the work under the sludge stabilization project.

The complete discussion of the safety concerns for running the Rocky Flats Ash can be found in USQ PFP-95-19. A summary of the important items is provided.

Rocky Flats Ash contains on the average 22% Carbon (IDC 420, Pulverized Incinerator Ash, October 29, 1991, Rev 0). Carbon, when heated in the presence of oxygen, can form carbon monoxide which is flammable in concentrations between 12.5% to 74%. A TGA/mass spectroscopy analysis was performed on a sample of granular carbon to determine maximum CO formation rates. The test results (Internal Memo 15530-95-LTC-039) indicated that CO₂ is preferentially formed as long as there is sufficient oxygen present. The minimum flow rate of air was established to be .86 scfm, and the procedure sets the flow at 1 scfm or greater (Internal Memo 15530-95-LTC-039). If CO were to form there is sufficient air flow through the furnaces to maintain the CO concentrations below the 12.5% flammability concentration.

Another potential scenario is an explosion due to the presence of lead nitrate. IDC 420 indicates the potential for lead in the feed to the incinerator at Rocky Flats. The material was heated to over 450 °C prior to being shipped to Hanford. The decomposition temperature of lead nitrate is 180 °C. Therefore, any lead nitrate present in the feed has already decomposed and will not be present in the ash that is being stabilized.

7. TEST DATA

Data to be recorded during this test procedure includes material item number, weight of the charge, number of hours at 1000°C, LOI sample number, mesh size, LOI results for the charge, weight of items, and any other process information that maybe useful.

8. PROCEDURE

Adjustments to the test procedure may be necessary in the field as the test run progresses. Therefore the Test Engineer is permitted to accommodate minor changes in direction resulting from facility description variants. Each change shall be approved per WHC-CM-3-5, Section 12.7. Change authorizations obtained by the telephone shall be noted as such.

A. PROCESS TEST

1. Test engineer should record material item number, date, charge number, and charge size on the Rocky Flats Ash data sheet.
2. Test Rocky Flats Ash material in HC-21C furnaces.
 - a. Have operators prepare to run furnaces with Rocky Flats Ash as charge material per procedure Z0-160-032.
 - b. Prior to placing the boats into the furnace, test engineer will determine where the thermocouples should be located for the test. One or both furnaces may be utilized for the test.
 - c. Test engineer to request operators to place mesh on top of boat if they are available. Record mesh size on data sheet. Enter NONE if none are available.
 - d. Test engineer to request operators to run Rocky Flats Ash for either a 1, 2, 3, or 4 hour dwell time (using program 3 or 7) at 1000°C and record the dwell time on the Rocky Flats Ash data sheet for each charge.
 - e. Record the thermocouple and furnace temperatures every 15 minutes or time increment determined by the test engineer on the furnace thermocouple data sheet.
 - f. After the furnace cycle has been completed, have the operators sieve and sample each boat for LOI individually per procedure Z0-160-034. Test engineer to record the sample number on the Rocky Flats Ash data sheet.
 - g. After LOI results are known, test engineer to record on the Rocky Flats Ash data sheet.
 - h. Repeat steps 1 - 2.g as many times as needed to get enough information to satisfy, Section 2.2.

B. PROCESS TEST 2

1. Test engineer will chose processed item(s) to observe for effect of moisture in the glovebox atmosphere when item is exposed for a period of time.
 - a. Record LOI and initial weight of item(s) to be observed on test 2 data sheet. If processing information on the item is available record on test 2 data sheet.
 - b. Item(s)' weight(s) will be recorded every two hours for the first shift and then twice a shift for the remainder of the test. Weights need not be recorded on graveyard shift or weekends. Frequency of recording data can be changed by the test engineer based on results.
 - c. Item(s) will be tested for approximately a week. Based on results test may be concluded or extended before a week.
 - d. Observations made through the test should be recorded on test 2 data sheet.
 - e. Sample item(s) for LOI when test is completed.
2. Test engineer will chose processed item(s) to observe for effect of moisture in the glovebox atmosphere when item is in a slip-lid can and taped.
 - a. Record LOI and initial weight of item(s) to be observed on test 2 data sheet. If processing information on the item is available record on test 2 data sheet.
 - b. Item(s)' weight(s) will be recorded every two hours for the first shift and then once or twice a shift for the remainder of the test. Weights need not be recorded on graveyard shift or weekends. Frequency of recording data can be changed by the test engineer based on results.
 - c. Item(s) will be tested for a week. Based on results item(s) test may be concluded or extended before a week.
 - d. Observations made through the test should be recorded on test 2 data sheet.
 - e. Sample item(s) for LOI when test is completed.

ROCKY FLATS ASH DATA SHEET

[illegible]

FURNACE THERMOCOUPLE DATA SHEET

DATE _____

[illegible]

TEST 2 DATA SHEET

[illegible]

Comments/ Observations: