COMPLETE

ENGINEERING CHANGE NOTICE

1. ECN No 625713

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	3a. USQ Required?	4. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	C. S. HOMI, 75320, R2-12, 373-1097	[] Yes [X] No	10/04/95
	5. Project Title/No./Work Order No. TANK 241-B-104 TANK CHARACTERIZATION PLAN	6. Bldg./Sys./Fac. No. B-104	7. Approval Designator N/A
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-TP-349 REV 1 KMB 10/4/95	9. Related ECN No(s). N/A	10. Related PO No. N/A

11a. Modification Work	11b. Work Package No.	11c. Modification Work Complete	11d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 11b) [X] No (NA Blks. 11b, 11c, 11d)	N/A	N/A Cog. Engineer Signature & Date	N/A Cog. Engineer Signature & Date

12. Description of Change

Complete revision.

13a. Justification (mark one)

Criteria Change	[X]	Design Improvement	[]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

13b. Justification Details

Format change.

14. Distribution (include name, MSIN, and no. of copies)

See attached Distribution Sheet

RELEASE STAMP

OFFICIAL RELEASE BY WHC DATE OCT 04 1995

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ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 625713

15. Design Verification Required	16. Cost Impact				17. Schedule Impact (days)	
	ENGINEERING		CONSTRUCTION			
[] Yes	Additional	[] $	Additional	[] $	Improvement	[]
[X] No	Savings	[] $	Savings	[] $	Delay	[]

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.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

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	Document Number/Revision	Document Number Revision

20. Approvals

	Signature	Date
OPERATIONS AND ENGINEERING		
Cog. Eng. C. S. Homi	C. S. Homi	10/4/95
Cog. Mgr. S. J. Eberlein	S. J. Eberlein	10/4/95
QA		
Safety		
Environ.		
Other		

	Signature	Date
ARCHITECT-ENGINEER		
PE		
QA		
Safety		
Design		
Environ.		
Other		
DEPARTMENT OF ENERGY		
Signature or a Control Number that tracks the Approval Signature		
ADDITIONAL		

RELEASE AUTHORIZATION

Document Number:	WHC-SD-WM-TP-349, REV 1
Document Title:	Tank 241-B-104 Tank Characterization Plan
Release Date:	10/4/95

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 Broz 10/4/95

SUPPORTING DOCUMENT

1. Total Pages 11

2. Title	3. Number	4. Rev No.
TANK 241-B-104 TANK CHARACTERIZATION PLAN	WHC-SD-WM-TP-349	1

5. Key Words

CHARACTERIZATION, GENERAL SAFETY ISSUES, SPECIFIC SAFETY ISSUES, INFORMATION REQUIREMENTS, PRIORITY

6. Author

Name: C. S. HOMI

Signature 10/4/95

Organization/Charge Code 75320/N4G6A

7. Abstract

This document is a plan that identifies the information needed to address relevant issues concerning short-term and long-term safe storage and long-term management of Single-Shell Tank (SST) 241-B-104.

8. RELEASE STAMP

OFFICIAL RELEASE BY WHC DATE OCT 04 1995

RECORD OF REVISION	(1) Document Number WHC-SD-WM-TP-349	Page 1

(2) Title
TANK 241-B-104 TANK CHARACTERIZATION PLAN

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
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Tank 241-B-104
Tank Characterization Plan

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Westinghouse Hanford Company

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

B-104	Tank 241-B-104
DQO	Data Quality Objective
HTCE	Historical Tank Content Estimate
DSSF	Double Shell Slurry Feed
NCPLX	Non-complexed
SST	Single-Shell Tank
TCP	Tank Characterization Plan
TOC	Total Organic Carbon
USQ	Unreviewed Safety Question
WHC	Westinghouse Hanford Company

1.0 INTRODUCTION

This Tank Characterization Plan (TCP) identifies the information needed to address relevant issues concerning short-term and long-term safe storage and long-term management of Single-Shell Tank 241-B-104 (B-104). It should be understood that the various needs and issues surrounding tank B-104 are evolving as new information about the tank is uncovered. As a result of this progression, this Tank Characterization Plan addresses only the issues that, to this date, have been identified. It is expected that deviations from this plan may occur as additional issues or needs arise which impact the management of SST B-104. As necessary, this Tank Characterization Plan will be revised to reflect those changes or deviations.

Tank B-104 was constructed between 1943 and 1944 and was put into service in August 1946. Initially tank B-104 received second cycle waste from August 1946 until February 1947 when it was declared full. The tank intermittently cascaded to B-105 from the first quarter of 1947 until the third quarter of 1950. In July and August of 1948, second cycle waste was transferred from B-104 to a crib. In March 1949, B-104 was again declared full. Again, in the second quarter of 1950, waste was transferred from B-104 to a crib. During the third quarter of 1950, B-104 received first cycle waste. During the third quarter of 1952, the existing supernate volume in B-104 was partially pumped out of the tank. From the fourth quarter of 1952 until the fourth quarter of 1953, B-104 received saltcake waste from the 242-B Evaporator. In the third quarter of 1953 and the fourth quarter of 1953, B-104 received U Plant waste and first cycle sludge respectively. The tank received drainage from a diversion box in the third quarter of 1954. The tank received wastewater from the third quarter of 1954 until the second quarter of 1972. Presently, the tank waste is classified as non-complexed. This tank currently contains waste with a total waste volume of 1,404 kL (371 kgal), which is equivalent to 331.1 centimeters (130.4 inches) of waste as measured from the baseline of the tank. The waste is comprised of 3.8 kL (1 kgal) of supernate; 230.9 kL (61 kgal) of saltcake; 340.7 kL (90 kgal) of unknown waste and 829 kL (219 kgal) of sludge with 151.4 kL (40 kgal) pumpable liquid remaining (Brevick 1994a).

The tank is sound and was declared inactive 1978. Tank B-104 is passively ventilated and was interim stabilized in June 1985 with intrusion prevention completed. The last photo was taken on October 13, 1988. The 1988 photographic montage indicates a thin bright yellow liquid covering part of the surface of an off white salt-like material (Brevick 1994b). There have been no changes in the tank since the photographs were taken; therefore, the montage should be representative of the tank contents. The last solids volume update was obtained on June 30, 1985 (Hanlon 1995).

There is no record of historical sampling and analysis information for tank B-104. This tank is not on any Watch list. Near-term sampling and analysis activities are focused on either verification of the non-watchlist tank status, identification of any new safety issues or changing the non-Watch List status. Should any safety issues be identified additional analysis will occur consistent with the identified issue.

In addition to the resolution of the safety issues, it is intended that all tank waste will be subject to pretreatment and retrieval to prepare for final storage or disposal. Presently, these long-range plans have yet to be fully identified and are, therefore, not included in this document.

2.0 PROGRAM ELEMENTS REQUIRING INFORMATION FOR TANK 241-B-104

This section identifies the various program elements, and identifies which of these programs require characterization data from tank B-104.

2.1 GENERAL SAFETY ISSUES

The *Tank Safety Screening Data Quality Objective* (Redus 1995) describes the sampling and analytical requirements that are used to screen waste tanks for unidentified safety issues. The primary analytical requirements for the safety screening of a tank are energetics, total alpha activity, moisture content, and flammable gas concentration.

2.2 SPECIFIC SAFETY ISSUES

2.2.1 Ferrocyanide

This tank is not on the Ferrocyanide Watch List and; therefore, no information needs are currently identified for this program element.

2.2.2 Organic

Tank B-104 is not on the Organics Watch List and; therefore, no information needs are currently identified for this program element.

2.2.3 High Heat

This tank is not on the High Heat Watch List and; therefore, no information needs are currently identified for this program element.

2.2.4 Flammable Gas

This tank is not on the Flammable Gas Watch List and; therefore, no information needs are currently identified for this program element.

2.2.5 Vapor

The tanks currently scheduled to be vapor sampled may be classified into four categories: (1) those tanks which are to be rotary mode core sampled (as a consequence of the rotary sampling system); (2) tanks on the Organic or Ferrocyanide Watch Lists; (3) tanks in C farm; and (4) tank BX-104, due to vapor exposure. Tank B-104 is not categorized in one of the above four groups but.

2.2.6 Criticality

No information separate from that for the general safety issue of tank B-104 are currently identified for this program element. However, if the general safety screening of tank B-104 identifies a potential criticality concern, analyses for fissile materials and neutron absorbers and poisons will be performed as identified in the safety screening data quality objective.

2.2.7 Screening Approach Evaluation

The safety screening approach is currently under review. Information is required from key tanks to determine if a revised approach to screening may be adopted, as proposed in Meacham, 1995.

2.3 CONTINUING OPERATIONS

2.3.1 Compatibility/Stabilization

No information needs are currently identified for this program element.

2.3.2 Evaporator

No information needs are currently identified for this program element.

2.4 DOUBLE-SHELL TANK WASTE ANALYSIS PLAN

No information needs are currently identified for this program element, although work to identify these needs is in progress and expected to be completed in fiscal year 1995.

2.5 DISPOSAL

2.5.1 Retrieval

Current retrieval needs (Bloom 1995) do not call for test samples to be taken from tank B-104.

2.5.2 Pretreatment/Vitrification

Tank B-104 has been identified as a bounding tank for pretreatment/disposal process development (Kupfer 1995).

2.6 HISTORICAL MODEL EVALUATION

Bounding tanks and data requirements for historical model evaluations are found in DQO *Historical Model Evaluation Data Requirements* (Simpson 1995). Tank B-104 has been identified as a primary bounding tank for BY Salt Cake waste type.

3.0 HOW INFORMATION WILL BE OBTAINED

The safety screening DQO requires that a vertical profile of the tank waste be obtained from at least two widely spaced risers. This vertical profile may be obtained using core, auger (for shallow tanks), or grab samples. Vapor sampling and push mode sampling events are scheduled and required. No other sampling is scheduled through fiscal year 1997 (Stanton 1995). The push mode sampling type has been chosen over other sampling modes due to both the depth of the tank (making auger sampling inadequate) and the fact that the surface of tank B-104 is comprised of supernatant and sludge.

The best current estimate of the water content in tank B-104 solids, as determined from the process records, is 65.4%; based on the HTCE (Brevick 1994a). Estimated (Toth et al 1995) water content in tank B-104 saltcake and sludge are 43.1% and 44.7% respectively (generated from a model based on sample data from similar tanks). If the variance of water in tanks already sampled and a statistical power curve is used then a minimum of two cores are needed to demonstrate a water content above 17% at 95% confidence. Should the measured mean be lower than anticipated or the measured variance higher, additional samples may be required. The TOC contained within the saltcake and sludge is estimated (Toth et al 1995) to be 0.6% and 0.1% (wet basis) respectively, which is significantly lower than the level of concern. Two core samples will be requested for this tank and this should meet the requirements for the above parameters.

The best current information indicates that 3 risers are available for sampling of tank B-104, 12" (15.2 cm) risers R2, R3 and R7. Two Push Mode samples with 7 segments each was collected from tank B-104 in June 1995.

4.0 PRIORITY OF INFORMATION REQUIREMENTS

Vapor sampling has not been scheduled for tank B-104. Push mode sampling was completed in June 1995 (Stanton 1995).

Table 4-1: Integrated DQO Requirements

Sampling Event	Applicable DQO	Sampling Requirements	Analytical Requirements
Push Mode Sampling	-Safety Screening DQO -Historical DQO -Pretreatment DQO	Core samples from 2 risers separated radially to the maximum extent possible	Energetics, Moisture, Total Alpha, Total Organic Carbon, Cations, Anions, Radionuclides, SpG

5.0 WHEN INFORMATION IS NEEDED

Data are required for Tank B-104 during FY 1996 for safety screening and to prepare a Tank Characterization Report.

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