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Title/Desc:
TANK 241B101 TANK CHARACTERIZATION PLAN

COMPLETE

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN № 625714

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.	6. Bldg./Sys./Fac. No.	7. Approval Designator
	TANK 241-B-101 TANK CHARACTERIZATION PLAN	B-101	N/A
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.)	9. Related ECN No(s).	10. Related PO No.
	WHC-SD-WM-TP-350 REV 1 0	N/A	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

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DATE OCT 04 1995

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ENGINEERING CHANGE NOTICE	Page 2 of 2	1. ECN (use no. from pg. 1) 625714

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-350, REV 1
Document Title:	Tank 241-B-101 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

Kara Broz

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SUPPORTING DOCUMENT

1. Total Pages 11

2. Title	3. Number	4. Rev No.
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5. Key Words

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

6. Author

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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-101.

8. RELEASE STAMP

OFFICIAL RELEASE BY WHC DATE OCT 04 1995

RECORD OF REVISION	(1) Document Number WHC-SD-WM-TP-350	Page 1

(2) Title
TANK 241-B-101 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-101
Tank Characterization Plan

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Westinghouse Hanford Company

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF ABBREVIATIONS

B-101	Tank 241-B-101
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-101 (B-101). It should be understood that the various needs and issues surrounding tank B-101 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-101. As necessary, this Tank Characterization Plan will be revised to reflect those changes or deviations.

Tank B-101 was constructed between 1943 and 1944 and was put into service in May 1945. Initially tank B-101 received metal waste from the second quarter of 1945 until October 1945. The tank received and transferred waste via cascade lines from 1945 until 1963. During the first quarter of 1953, B-101 processed feed for U Plant. In late December of 1953, the sluicing of metal waste from B-101 was completed. From the fourth quarter of 1953 until the second quarter of 1963, the tank contained evaporator bottoms waste. During the third quarter of 1957, in-farm scavenged feed was sent to the 244-CR Vault. From the second quarter of 1960 until the first quarter of 1970, B-101 received wastewater. Also, it was found that during the second quarter of 1960 wastewater leaked into the pipe encasement which drained to B-101. During the fourth quarter of 1963 the tank received coating waste. B-101 received B Plant high level waste from the second quarter of 1969 until the second quarter of 1970. From the third quarter of 1970 until the first quarter of 1973, the tank received B Plant low level waste. Presently, the tank waste is classified as non-complexed. This tank currently contains waste with a total waste volume of 427.8 kL (113 kgal), which is equivalent to 92.8 centimeters (36.5 inches) of waste as measured from the baseline of the tank. The waste is comprised of 284 kL (75 kgal) of saltcake; 38 kL (10 kgal) of unknown waste and 106 kL (28 kgal) of sludge with no supernatant and pumpable liquid remaining (Brevick 1994a).

The tank is an assumed leaker (with a leak of approximately 30 kL [8 kgal] in 1974) and was removed from service in 1974. Tank B-101 is passively ventilated and interim stabilized in March 1981 with intrusion prevention completed. The last photo was taken on May 19, 1983. The 1983 photographic montage cannot be located but, a 1975 montage indicates a solid rough black surface with no visible liquid (Brevick 1994b). The level was adjusted and the supernatant was pumped after this montage was taken; therefore, this montage description does not represent current tank contents. The last solids volume update was obtained on April 28, 1982 (Hanlon 1995).

An analysis was conducted on a B-101 sludge sample in February 1976. The sample was found to have a consistency of soft mud and was dark brown. Particle size distribution, of sample solids, showed that the majority (90 wt%) of the solids was between 5 μm and 50 μm. A heat generation rate based on ^{89}Sr, ^{90}Sr and ^{137}Cs was calculated to be 0.0201 watts/liter of sludge.

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-101

This section identifies the various program elements, and identifies which of these programs require characterization data from tank B-101.

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-101 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. Since tank B-101 is NOT categorized in one of the above four groups, vapor sampling is not required for this tank.

2.2.6 Criticality

No information separate from that for the general safety issue of tank B-101 are currently identified for this program element. However, if the general safety screening of tank B-101 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-101.

2.5.2 Pretreatment/Vitrification

Tank B-101 has not been identified as an alternate 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-101 has been identified as an alternate bounding tank for any waste type, but will not be evaluated for this DQO unless directed by the program.

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. Only a push mode sampling event is 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-101 is comprised of supernatant and sludge.

The best current estimate of the water content in tank B-101 solids, as determined from the process records, is 54.0%; based on the HTCE (Brevick 1994a). Estimated (Toth et al 1995) water content in tank B-101 sludge is 34.5% (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 three cores are needed to demonstrate a water content above 17% at 95% confidence. The TOC contained within the sludge is estimated (Toth et al 1995) to be 0.1% (wet basis), which is significantly lower than the level of concern. Two core samples will be requested for this tank. Should the measured mean be lower than anticipated or the measured variance higher, additional samples may be required.

Present information indicate that six risers could be available for sampling in tank B-101. Two risers were used during the June 1995 Push Mode sampling event.

4.0 PRIORITY OF INFORMATION REQUIREMENTS

Vapor sampling is not required for this tank. 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	Core samples from 2 risers separated radially to the maximum extent possible (complete)	Energetics, Moisture, Total Alpha, Total Organic Carbon, SpG

5.0 WHEN INFORMATION IS NEEDED

Data are required for Tank B-101 during FY 1996 for safety screening and to prepare a Tank Characterization Report.

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