COMPLETE

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN № 625716

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-S-107 TANK CHARACTERIZATION PLAN	S-107	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-348 REV X 0 KMB 10/5/95	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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A-7900-013-2 (11/94) GEF095

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1): 625716

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	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog. Eng. C. S. Homi	10/4/95	PE	
Cog. Mgr. S. J. Eberlein	10-5-95	QA	
QA		Safety	
Safety		Design	
Environ.		Environ.	
Other		Other	
		DEPARTMENT OF ENERGY	
		Signature or a Control Number that tracks the Approval Signature	
		ADDITIONAL	

RELEASE AUTHORIZATION

Document Number:	WHC-SD-WM-TP-348, REV 1
Document Title:	Tank 241-S-107 Tank Characterization Plan
Release Date:	10/5/95

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 10/5/95

SUPPORTING DOCUMENT

1. Total Pages 12

2. Title	3. Number	4. Rev No.
TANK 241-S-107 TANK CHARACTERIZATION PLAN	WHC-SD-WM-TP-348	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-S-107.

8. RELEASE STAMP

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RECORD OF REVISION	(1) Document Number WHC-SD-WM-TP-348	Page 1

(2) Title
TANK 241-S-107 TANK CHARACTERIZATION PLAN

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release	
		(5) Cog. Engr.	(6) Cog. Mgr. Date
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Revision 1
UC-2070

Tank 241-S-107
Tank Characterization Plan

C. S. Homi
Westinghouse Hanford Company

Date Published
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LIST OF ABBREVIATIONS

DQO	Data Quality Objective
DSSF	Double Shell Slurry Feed
HTCE	Historical Tank Content Estimate
NCPLX	Non-complexed
S-107	Tank 241-S-107
SST	Single-Shell Tank
SUMMA®	Trademark of Molectrics, Inc.
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-S-107 (S-107). It should be understood that the various needs and issues surrounding tank S-107 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 S-107. As necessary, this Tank Characterization Plan will be revised to reflect those changes or deviations.

Tank S-107 was constructed between 1943 and 1944 and was put into service in August 1952. Initially tank S-107 received REDOX facility waste from the fourth quarter of 1952 until the fourth quarter of 1956. Also, from the third quarter of 1952 until the first quarter of 1975, the tank received waste water. The tank received REDOX cladding waste from the fourth quarter of 1954 until the first quarter of 1967. From the first quarter of 1957 until the third quarter of 1968, the tank received coating waste. From the second quarter of 1968 until the second quarter of 1971, the tank received evaporator bottoms waste from the REDOX evaporators. From the fourth quarter of 1968 until the second quarter of 1972, the tank received saltcake waste from the REDOX concentrator. From the first quarter of 1974 until the second quarter of 1980, the tank received a wide variety of waste types. In the third quarter of 1980 the waste contained in the tank was classified as double shell slurry feed. Presently, the tank waste is classified as non-complexed. This tank currently contains waste with a total waste volume of 1,423.4 kL (376 kgal), which is equivalent to 366.3 centimeters (144.2 inches) of waste as measured from the baseline of the tank. The waste is comprised of 53 kL (14 kgal) of supernatant; 83.3 kL (22 kgal) of saltslurry; 484.6 kL (128 kgal) of saltcake and 802.6 kL (212 kgal) of sludge with 166.6 kL (44 kgal) of pumpable liquid remaining (Brevick 1994a).

The tank is sound and was removed from service in 1980. Tank S-107 is passively ventilated, partially isolated in December 1982 and is awaiting interim isolation. The last photo was taken on March 12, 1987. The 1987 photographic montage indicates that there appears to be a small amount of solid material clinging to the wall and the waste in the rest of the tank appears to be a liquid that has be described as sludgy (Brevick 1994b). The last solids volume update was obtained on September 25, 1980 (Hanlon 1995).

Samples of S-107 waste taken prior to 1975 contained a large amount of liquid and; therefore, because waste was added to the tank throughout the 1970s, these analyses are not representative of current tank contents. The most recent sample analysis, in 1980, found that the waste was made up mostly of solids of which the main constituents were nitrates, nitrites, aluminates, hydroxides, phosphates, carbonates and some organic material. Samples analyzed in 1978 and 1979 were found to be similar to the 1980 analysis.

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-S-107

This section identifies the various program elements, and identifies which of these programs require characterization data from tank S-107.

2.1 GENERAL SAFETY ISSUES

The *Tank Safety Screening Data Quality Objective* (Babad et al. 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 S-107 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, however based on changes in level due to barometric pressure fluctuations (Whitney, 1995) the flammable gas DQO (McDuffie, 1995) will be applied.

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 S-107 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 S-107 are currently identified for this program element. However, if the general safety screening of tank S-107 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

This section does not apply because tank S-107 is a single shell tank.

2.5 DISPOSAL

2.5.1 Retrieval

Current retrieval needs (Bloom 1995) do not call for test samples to be taken from tank S-107.

2.5.2 Pretreatment/Vitrification

Tank S-107 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 S-107 has been identified as a primary bounding tank for Redox 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. 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 S-107 is comprised of supernatant and sludge.

The best current estimate of the water content in tank S-107 solids, as determined from the process records, is 53.7%; based on the HTCE (Brevick 1994a). Estimates (Toth et al 1995) of water content in tank S-107 saltcake and sludge are 21.6% and 42.4% 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 three cores are needed to demonstrate a water content above 17% at 95% confidence. The TOC contained within the saltcake is estimated (Toth et al 1995) to be 0.4% (wet basis), which is significantly lower than the level of concern. Three 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.

The best current information indicates that 3 risers are available for sampling of tank S-107, three 4" (10.2 cm) risers R2, R3 and R11. It is recommended that these risers be chosen because, they are risers that are separated radially to the maximum extent possible and; therefore, will provide a larger amount of data about the vertical and horizontal waste layers within the tank. Initial information will be taken from these 3 risers and assessed to determine if more samples are required. Two additional risers are available but, equipment will have to be removed from each individual riser to utilize these risers for sampling. Alternate sampling methods, installation of a riser or removal of equipment from risers presently considered unavailable, are possible future options.

4.0 PRIORITY OF INFORMATION REQUIREMENTS

Vapor sampling is scheduled for November 1995. Push mode sampling is scheduled for October 1995 (Stanton 1995).

Table 4-1: Integrated DQO Requirements

Sampling Event	Applicable DQO	Sampling Requirements	Analytical Requirements
Vapor Sampling	-Health & Safety Vapor Issue Resolution DQO	3 SUMMA® canisters 6 Triple Sorbent Traps 8 Sorbent Trap Systems	Gas Flammability Gas Toxicity -Organic Vapors -Permanent Gases
Push Mode Sampling	-Safety Screening DQO -Flammable Gas DQO -Historical DQO -Pretreatment DQO	Core samples from 3 risers separated to the maximum extent possible	Energetics, Moisture, Total Alpha, Cation, Anions, Radionuclides, SpG

5.0 WHEN INFORMATION IS NEEDED

Data are required for Tank S-107 during FY 1996 for safety screening and to prepare a Tank Characterization Report.

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