H COMPLETE

ENGINEERING CHANGE NOTICE

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1. ECN 631552

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 []	Clarence Homi, Data Assessment and Interpretation, R2-12, 373-1097	[] Yes [X] No	05/08/96
	5. Project Title/No./Work Order No. Tank 241-C-104	6. Bldg./Sys./Fac. No. 241-C-104	7. Approval Designator N/A
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-TP-208, Rev. 0	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

Changed to comply with new template and DOE-RL recommended modifications.

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

See attached distribution.

RELEASE STAMP

MAY 10 1996

DATE

HANFORD RELEASE

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ID: 58

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1)
ECN-631552

15. Design Verification Required
[ ] Yes
[X] No

16. Cost Impact

ENGINEERING			CONSTRUCTION		
Additional	[ ]	$	Additional	[ ]	$
Savings	[ ]	$	Savings	[ ]	$

17. Schedule Impact (days)

Improvement	[ ]
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
N/A		

20. Approvals

Signature	Date	Signature	Date
OPERATIONS AND ENGINEERING		ARCHITECT-ENGINEER	
Cog. Eng. C.S. Homi	5/8/96	PE	
Cog. Mgr. ~~J~~ Kristofzski	5/9/96	QA	
QA		Safety	
Safety		Design	
Environ.		Environ.	
Other		Other	
		DEPARTMENT OF ENERGY	
		Signature or a Control Number that tracks the Approval Signature	
		ADDITIONAL	

Tank 241-C-104 Tank Characterization Plan

C. S. Homi
Westinghouse Hanford Company, Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-87RL10930

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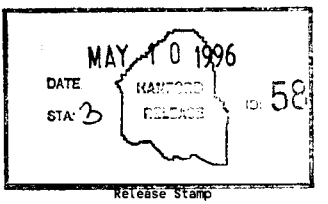
Key Words: Characterization, General Safety Issues, Specific Safety Issues, Information Requirements, Schedule

Abstract: This document is a plan that identifies the information needed to address relevant issues concerning short-term and long-term storage and long-term management of single-shell tank 241-C-104.



Release Approval 5/9/96
Date

Release Stamp

Approved for Public Release

RECORD OF REVISION	(1) Document Number WHC-SD-WM-TP-208	Page 1

(2) Title
Tank 241-C-104 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
0	(7) Initially released 08/28/95 on EDT-613353.	C.S. Homi	J.G. Kristofzski
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Revision 1
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Tank 241-C-104
Tank Characterization Plan

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Westinghouse Hanford Company

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Prepared for the U.S. Department of Energy
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Management and Operations Contractor for the
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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-C-104 (C-104). It should be understood that the various needs and issues surrounding tank C-104 are evolving as new information about the tank is uncovered. As a result of this progression, this TCP 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 tank C-104. This TCP will be revised as necessary to reflect those changes or deviations. The plan reflects the best information available as of May 1996.

Tank C-104 was constructed between 1943 and 1944 and was put into service in October 1946. Initially tank C-104 received metal waste from the fourth quarter of 1946 until the fourth quarter of 1954. Tank C-104 is the first tank in a three tank cascade which also includes 241-C-105 and 241-C-106. By February 1947 the cascade was full. The tank cascaded between 1946 and 1953. The metal waste was sluiced in the fourth quarter 1953 to recover uranium. The supernatant was sent to the 244-CR process vault in 1954 and the tank was declared empty in the first quarter of 1955. U plant waste was added to the tank in the fourth quarter of 1955. The tank was emptied again and received or contained coating waste from the first quarter of 1956 until the third quarter of 1969. From the first quarter of 1956 until the third quarter of 1972, the tank received Plutonium Uranium Extraction (PUREX) cladding waste. From the first quarter of 1969 until the third quarter of 1976, the tank received various wastes. The tank received decontamination waste from the second quarter of 1965 until the first quarter of 1974. From the fourth quarter of 1969 until the fourth quarter of 1972, the tank received PUREX organic wash waste. During the third and fourth quarters of 1970, the tank received thorium high-level waste. From the fourth quarter of 1970 until the second quarter of 1976, the tank received PUREX low-level waste. The tank received PUREX high-level waste from the fourth quarter of 1973 until the second quarter of 1975. From the first quarter of 1974 until the fourth quarter of 1975, the tank received wastewater. From the second quarter of 1976 until the fourth quarter of 1977, the tank contained dilute PUREX feed. During 1978 the waste was classified as non-complexed. From the first quarter of 1979 until the fourth quarter of 1980, the waste was classified as complex waste. The tank is sound and was declared inactive in March 1980. Tank C-104 is actively ventilated, was partially isolated in December 1982 and declared interim stabilized in September 1989 with intrusion prevention completed in February 1991 (Brevick 1994).

Tank C-104 currently has a total waste volume of 1,117 kL (295 kgal), which is equivalent to 261 cm (102.7 inches) of waste as measured from the baseline of the tank (Hanlon 1996).

This tank is not on any Watch List.

Near-term sampling and analysis activities are focused on either verifying or changing the Watch List tank status, and identifying any new safety issues. 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-C-104

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

2.1 GENERAL SAFETY ISSUES

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

2.2 SPECIFIC SAFETY ISSUES

2.2.1 Ferrocyanide

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

2.2.2 Organic

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

2.2.5 Vapor

All 177 underground tanks must be vapor-sampled for organic solvent screening as per *Recommendation 93-5 Implementation Plan* (DOE-RL 1996). Some tanks may require additional vapor sampling due to other program needs. These tanks 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 exhauster permit requirements); (2) tanks on the Organic or Ferrocyanide Watch Lists; (3) tanks in C farm; and (4) tank 241-BX-104, due to vapor exposure. Information needs must satisfy *Data Quality Objectives for Tank Hazardous Vapor Safety Screening* (Osborne and Buckley 1995), and for rotary mode only, *Rotary Core Vapor Sampling Data Quality Objective* (Price 1994), and *Data Quality Objective for Regulatory Requirements for Hazardous and Radioactive Air Emissions Sampling and Analysis* (Mulkey and Markillie 1995) as amended by *Status of the Current Understanding of the Toxic Air Pollutants (TAPS) and Hanford Tank Farm Vapor Space Characterization; Recommended Path Forward and Justification for Continued RMCS Exhauster Operations* (Laws 1996).

Tank C-104 was vapor sampled in March 1994 in support of Osborne et al. (1994).

2.2.6 Criticality

No information separate from that for the general safety issue of tank C-104 are currently identified for this program element. However, if the general safety screening of tank C-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 (DQO).

2.3 CONTINUING OPERATIONS

2.3.1 Compatibility/Stabilization

This section does not apply to tank C-104.

2.3.2 Evaporator

This section does not apply to tank C-104.

2.4 DOUBLE-SHELL TANK WASTE ANALYSIS PLAN

This section does not apply because tank C-104 is a single shell tank.

2.5 DISPOSAL

2.5.1 Retrieval

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

2.5.2 Pretreatment/Vitrification

Tank C-104 has been identified as a bounding tank for pretreatment/disposal process development strategy (Kupfer et al. 1995). The strategy only requires that sample material be made available via archive samples and does not require any specific analyses to be done on the samples.

2.6 HISTORICAL MODEL EVALUATION

Bounding tanks and data requirements for historical model evaluations are found in DQO *Historical Model Evaluation Data Requirements* (Simpson and McCain 1995). Tank C-104 has been identified as a primary bounding tank for checking waste variability. All single-shell tanks were prioritized in the *Tank Waste Characterization Basis* (Brown et al. 1995) document using the Historical DQO .

3.0 HOW INFORMATION WILL BE OBTAINED

The number of samples required to characterize a tank is a function of waste heterogeneity and the desired confidence to make a correct decision. As directed by the safety screening DQO, if inadequate information exists to determine an appropriate number of samples, two vertical profiles will be obtained. These vertical profiles may be obtained using core, auger (for shallow tanks), or grab samples. If analysis of these profiles reveals that additional profiles are required to meet data needs, more sample profiles will be requested. Prior to rotary sampling it is necessary to vapor sample the tank as per requirements of *Rotary Core Vapor Sampling Data Quality Objective* (Price 1994).

4.0 PRIORITY OF INFORMATION REQUIREMENTS

Vapor sampling was completed in March 1994. Rotary mode core sampling is scheduled to begin February 1997 (Stanton 1996). Refer to Table 4-1 for the current DQO requirements and planned sampling and analytical requirements.

Table 4-1: Integrated DQO Requirements and Priorities

Sampling Event	Applicable Issues	Sampling Requirements*	Analytical Requirements*
Vapor Sampling	-Organic Solvent Layer 93-5 Vapor Issue -Rotary Mode Sampling DQOs -Hazardous Vapor DQO	Steel canisters, Triple Sorbent Traps, Sorbent Trap Systems	Flammable Gas Organic Vapors Permanent Gases
Rotary Mode Core Sampling	-Safety Screening DQO -Historical DQO	Core samples from a minimum of 2 risers separated radially to the maximum extent possible. Combustible gas measurement.	Flammability, Energetics, Moisture, Total alpha activity, Density, Anions, Metals, Radionuclides, Total Organic Carbon

* Consult each applicable DQO in force at the time for sampling and analytical requirements.

5.0 WHEN INFORMATION WILL BE AVAILABLE

According to Stanton (1996) data are expected to be available from the rotary mode core sampling event for tank C-104 in July 1997. This time may be altered if the sampling schedule changes. Data are available from the March 1994 vapor sampling.

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DISTRIBUTION SHEET

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