

ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 631571

Proj.
ECN

2. ECN Category (mark one) Supplemental <input type="checkbox"/> Direct Revision <input checked="" type="checkbox"/> Change ECN <input type="checkbox"/> Temporary <input type="checkbox"/> Standby <input type="checkbox"/> Supersedure <input type="checkbox"/> Cancel/Void <input type="checkbox"/>	3. Originator's Name, Organization, MSIN, and Telephone No. Clarence Homi, Evaluation and Planning, R2-12, 373-1097	3a. USQ Required? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	4. Date 05/09/96	
	5. Project Title/No./Work Order No. Tank 241-TY-103	6. Bldg./Sys./Fac. No. 241-TY-103	7. Approval Designator N/A	
	8. Document Numbers Changed by this ECN (includes sheet no. and rev.) WHC-SD-WM-TP-300, Rev. 0-B	9. Related ECN No(s). ECNs: 621328, 621335	10. Related PO No. N/A	

11a. Modification Work <input type="checkbox"/> Yes (fill out Blk. 11b) <input checked="" type="checkbox"/> 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
---	------------------------------	---	---

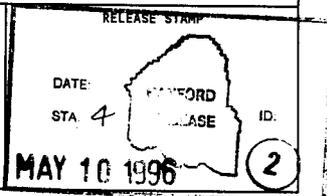
12. Description of Change:
 Complete revision.

13a. Justification (mark one)

Criteria Change <input checked="" type="checkbox"/>	Design Improvement <input type="checkbox"/>	Environmental <input type="checkbox"/>	Facility Deactivation <input type="checkbox"/>
As-Found <input type="checkbox"/>	Facilitate Const <input type="checkbox"/>	Const. Error/Omission <input type="checkbox"/>	Design Error/Omission <input type="checkbox"/>

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.



Tank 241-TY-103 Tank Characterization Plan

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

EDT/ECN: ECN-631571 UC: 2070
Org Code: 79200 Charge Code: N4G6A
B&R Code: EW 3120074 Total Pages: 9

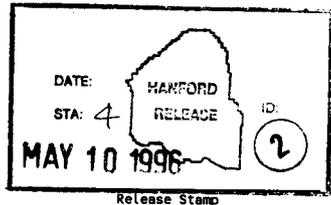
Key Words: Characterization, General Safety Issues, Specific Safety Issues, Information Requirements, Schedule

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-TY-103.

TRADEMARK DISCLAIMER. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

Printed in the United States of America. To obtain copies of this document, contact: WHC/BCS Document Control Services, P.O. Box 1970, Mailstop H6-08, Richland WA 99352, Phone (509) 372-2420; Fax (509) 376-4989.


Release Approval _____ Date 5/10/96



Approved for Public Release

WHC-SD-WM-TP-300

Revision 1

UC-2070

Tank 241-TY-103 Tank Characterization Plan

J. Jo

Westinghouse Hanford Company

Date Published

May 1996

Prepared for the U.S. Department of Energy
Office of Environmental Restoration and
Waste Management



**Westinghouse
Hanford Company**

P.O. Box 1970

Richland, Washington

Management and Operations Contractor for the
U.S. Department of Energy under Contract DE-AC06-87RL10930

Approved for Public Release

TABLE OF CONTENTS

1.0 INTRODUCTION 1

2.0 PROGRAM ELEMENTS REQUIRING INFORMATION FOR TANK 241-TY-103 1

 2.1 GENERAL SAFETY ISSUES 1

 2.2 SPECIFIC SAFETY ISSUES 2

 2.2.1 Ferrocyanide 2

 2.2.2 Organic 2

 2.2.3 High Heat 2

 2.2.4 Flammable Gas 2

 2.2.5 Vapor 3

 2.2.6 Criticality 3

 2.3 CONTINUING OPERATIONS 3

 2.3.1 Compatibility/Stabilization 3

 2.3.2 Evaporator 3

 2.4 DOUBLE-SHELL TANK WASTE ANALYSIS PLAN 3

 2.5 DISPOSAL 3

 2.5.1 Retrieval 3

 2.5.2 Pretreatment/Vitrification 3

 2.6 HISTORICAL MODEL EVALUATION 3

3.0 HOW INFORMATION WILL BE OBTAINED 4

4.0 PRIORITY OF INFORMATION REQUIREMENTS 4

5.0 WHEN INFORMATION WILL BE AVAILABLE 4

6.0 REFERENCES 5

LIST OF TABLES

4-1 Integrated DQO Requirements and Priorities 4

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-TY-103 (TY-103). It should be understood that the various needs and issues surrounding tank TY-103 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 TY-103. As necessary, this TCP will be revised to reflect those changes or deviations. This plan reflects the best information available as of May 1996.

Tank TY-103 was constructed between 1951 and 1952 and put into service in 1953. Activity in tank TY-103 began when it received waste from the tributyl phosphate uranium extraction process at U Plant from the third quarter of 1953 until the fourth quarter of 1954. From the first quarter of 1955 until the first quarter of 1968, the tank received and/or contained first-cycle decontamination waste. The tank contained tributyl phosphate waste from the fourth quarter of 1959 until the first quarter of 1968. Decontamination waste was sent to the tank from the first quarter of 1961 until the fourth quarter of 1967. Between the second quarter of 1968 and the first quarter of 1973, the tank received the following wastes: Plutonium Uranium Extraction (PUREX) organic wash waste, coating waste, Reduction Oxidation (REDOX) waste, evaporator waste, B plant low-level waste, and REDOX ion exchange waste. Tank TY-103 was labeled a confirmed leaker in 1973 and inactive in 1976. Level adjustments were made in November 1978 and July 1982. The tank was interim-stabilized in 1983 and intrusion prevention was completed in August 1984. The tank is classified as a stabilized, assumed leaker (Brevick et al. 1995).

Tank TY-103 currently contains non-complexed waste with a total volume of 613 KI (162 ggal), which is equivalent to 169 cm (66 in.) of waste as measured from the baseline of the tank (Hanlon).

This tank is on the Ferrocyanide Watch list.

Near-term sampling and analysis activities are focused on verifying or changing the Watch List tank status and identifying of 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-TY-103

This section identifies the various program elements, and identifies which of these programs require characterization data from tank TY-103.

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 on the Ferrocyanide Watch List. Sampling and analysis requirements must be performed per *Data Requirements for the Ferrocyanide Safety Issue Developed through the Data Quality Objectives Process* (Meacham et al. 1995). The primary analyses employed will determine the total fuel concentration, nickel, total cyanide, and moisture content. Further analyses will be employed to obtain secondary data such as temperature (data will be obtained from tank thermocouples), total organic carbon (TOC), ¹³⁷Cs and ⁹⁰Sr (Meacham et al. 1995).

2.2.2 Organic

This tank is not on the Organic 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).

Information needs must satisfy *Data Quality Objectives for Generic In-Tank Health and Safety Vapor Issue Resolution* (Osborne et al. 1995) and, for rotary mode core sampling, *Rotary Sampling Core Vapor Sampling Data Quality Objective* (Price 1994). Since tank

TY-103 is categorized in one of the above four groups, vapor sampling is required for this tank.

Tank TY-103 was vapor sampled in April 1995 in support of Osborne et al. (1995)

2.2.6 Criticality

No information separate from that for the general safety issue of tank TY-103 are currently identified for this program element. However, if the general safety screening of tank TY-103 identifies a potential criticality concern, analyses for fissile materials and neutron sorbers 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 TY-103.

2.3.2 Evaporator

This section does not apply to tank TY-103.

2.4 DOUBLE-SHELL TANK WASTE ANALYSIS PLAN

This section does not apply because tank TY-103 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 TY-103.

2.5.2 Pretreatment/Vitrification

Tank TY-103 has not been identified as a bounding tank for pretreatment/ disposal process development strategy (Kupfer et al. 1995). All tanks were prioritized using the pretreatment strategy in the *Tank Waste Characterization Basis* (Brown et al. 1995) document and a portion of archive sample material could be used for pretreatment testing if available. The strategy does not require any specific analyses to be done on the samples.

2.6 HISTORICAL MODEL EVALUATION

This tank is identified as an acceptable alternative for bounding tank B-104 in *Historical Model Evaluation Data Requirements* (Simpson and McCain 1995). The applicability of these analyses will be determined based on tank TY-103 sampling and analysis and will be documented in the tank specific sample and analysis plan.

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 necessary to meet data needs, more sample profiles will be requested. Prior to rotary sampling it is necessary to vapor sample the tank per the requirements of *Rotary Core Vapor Sampling Data Quality Objective* (Price 1994).

4.0 PRIORITY OF INFORMATION REQUIREMENTS

Rotary mode core sampling is scheduled to begin in July 1996. Vapor sampling was completed in April 1995 (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*
Rotary Mode Core Sampling	-Safety Screening DQO -Ferrocyanide DQO	Core samples from 2 risers separated to the maximum extent possible Combustible gas measurement	Flammability, Energetics, Moisture, Total alpha activity, Density, Cyanide, Nickel
Vapor Sampling	-Organic Solvent Layer 93-5 Vapor Issue -Rotary Mode Sampling DQO -Hazardous Vapor DQO	Steel canisters, Triple Sorbent Traps, Sorbent Trap Systems.	Flammable Gas Organic Vapors Permanent Gases

* 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 TY-103 in November 1996. This time may be altered if the sampling schedule changes. Data are available from the April 1995 vapor sampling.

6.0 REFERENCES

- Bloom, G. R. and Q. H. Nguyen, 1995, *Characterization Data Needs for Development, Design and Operation of Retrieval Equipment Developed Through the Data Quality Objective Process*, WHC-SD-WM-DQO-008, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Brevick, C. H., L. A. Gaddis, and W. W. Pickett, 1995, *Supporting Document for the Historical Tank Content Estimate TY Tank Farm*, WHC-SD-WM-ER-322, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Brown, T. M., S. J. Eberlein, and T. J. Kunthara, 1995, *Tank Waste Characterization Basis*, WHC-SD-WM-TA-164, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- DOE-RL, 1996, *Recommendation 93-5 Implementation Plan*, DOE/RL-94-0001, Rev. 1, U.S. Department of Energy, Richland, Washington.
- Dukelow, G. T., J. W. Hunt, H. Babad, and J. E. Meacham, 1995, *Tank Safety Screening Data Quality Objective*, WHC-SD-WM-SP-004, Rev. 2, Westinghouse Hanford Company, Richland, Washington.
- Hanlon, B. M., 1996, *Waste Tank Summary for Month Ending January 31, 1996*, WHC-EP-0182-94, Westinghouse Hanford Company, Richland, Washington.
- Kupfer, M. J., W. W. Schultz, and J. T. Slankas, 1995, *Strategy for Sampling Hanford Site Tank Wastes for Development of Disposal Technology*, WHC-SD-WM-TA-154, Rev. 1, Westinghouse Hanford Company, Richland, Washington.
- Laws, G. L., 1996, *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*, (telephone conference memorandum 01830-96-022, to Distribution, March 8), Westinghouse Hanford Company, Richland, Washington.
- Meacham, J. E., R. J. Cash, B. A. Pulsipher, and G. Chen, 1995, *Data Requirements for the Ferrocyanide Safety Issue Developed through the Data Quality Objectives Process*, WHC-SD-WM-DQO-007, Rev. 2, Westinghouse Hanford Company, Richland, Washington.
- Mulkey, C. H., and K. D. Markillie, 1995, *Data Quality Objective for Regulatory Requirements for Hazardous and Radioactive Air Emissions Sampling and Analysis*, WHC-SD-WM-DQO-021, Rev. 0, Westinghouse Hanford Company, Richland, Washington.
- Osborne, J. W., J. L. Huckaby, E. R. Hewitt, C. M. Anderson, D. D. Mahlum, B. A. Pulsipher, and J. Y. Young, 1995, *Data Quality Objectives for Generic In-Tank Health and Safety Vapor Issue Resolution*, WHC-SD-WM-DQO-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.
- Osborne, J. W. and L. L. Buckley, 1995, *Data Quality Objective for Tank hazardous Vapor Safety Screening*, WHC-SD-WM-DQO-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.
- Price, D. N., 1994, *Rotary Core Vapor Sampling Data Quality Objective*, WHC-SD-WM-SP-003, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

WHC-SD-WM-TP-300, REV 1

Simpson, B. C., and D. J. McCain, 1995, *Historical Model Evaluation Data Requirements*, WHC-SD-WM-DQO-018, Rev. 0A, Westinghouse Hanford Company, Richland, Washington.

Stanton, G. A., 1996, Baseline Sampling Schedule, Change 96-02 (Internal Memo 75610-96-06 to Distribution, April 17), Westinghouse Hanford Company, Richland, Washington.

DISTRIBUTION SHEET

To Distribution		From Evaluation and Planning		Page 1 of 1	
				Date	05/09/96
Project Title/Work Order WHC-SD-WM-TP-300, Rev. 1, "Tank 241-TY-103 Tank Characterization Plan"				EDT No.	N/A
				ECN No.	ECN-631571
Name	MSIN	Text With All Attach.	Text Only	Attach. / Appendix Only	EDT/ECN Only

ONSITE

U. S. Department of Energy -
Richland Field Office

W. Liou	S7-54	X
N. W. Willis	S7-54	X

Westinghouse Hanford Company

G. D. Forehand	S7-21	X
C. S. Homi	R2-12	X
J. Jo	R2-12	X
Central Files	A3-88	X
T.C.R.C.	R2-12	X

OFFSITE

U. S. Department of Energy - Headquarters
Office of Environmental Restoration and
Waste Management EM-563
12800 Middlebrook Road
Germantown, MD 20874

J. A. Poppiti		X
---------------	--	---