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| ENGINEERING CHANGE NOTICE | Page 1 of <u>2</u> | 1. ECN 631544 ----- Proj. ECN |
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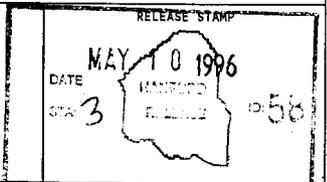
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13b. Justification Details
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14. Distribution (include name, MSIN, and no. of copies)
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Tank 241-AN-103 Tank Characterization Plan

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Westinghouse Hanford Company, Richland, WA 99352
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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 double-shell tank 241-AN-103.

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Tank 241-AN-103 Tank Characterization Plan

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Hanford Company**

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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 double shell tank 241-AN-103 (AN-103). It should be understood that the various needs and issues surrounding tank AN-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 AN-103. As necessary, this TCP will be revised as necessary to reflect those changes or deviations. This plan reflects the best information available as of May 1996.

Tank AN-103 was constructed in 1980 and entered into service in September 1981. The tank received non-complexed waste from tank 241-AN-102 until February 1984. During 1983, it received 7.6 kL (2 Kgal) of low-level waste from B-Plant and dilute non-complexed waste from the 200 East Area single-shell tanks. From March 1984 to April 1986, the tank received double-shell slurry feed. Tank AN-103 is currently inactive and holds concentrated waste (Brevick 1995).

Tank AN-103 currently contains a total waste volume of 3600 kL (951 kgal) which is equivalent to 881 cm (347 in) of waste, as measured from the baseline of the tank (Hanlon 1996).

This tank is on the Flammable Gas 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-AN-103

This section identifies the various program elements, and identifies which of these programs require characterization data from tank AN-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 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 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 on the Flammable Gas Watch List. The applicable data quality objective (DQO) for this safety issue is: *Flammable Gas Safety Program: Data Requirements for Core Sample Analysis Developed through the Data Quality Objectives Process* (McDuffie 1995).

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).

2.2.6 Criticality

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

2.3 CONTINUING OPERATIONS

2.3.1 Compatibility/Stabilization

This section does not apply to tank AN-103.

2.3.2 Evaporator

This section does not apply to tank AN-103.

2.4 DOUBLE-SHELL TANK WASTE ANALYSIS PLAN

Requirements for double-shell waste analyses are found in *Double-Shell Tank Waste Analysis Plan* (Mulkey and Jones 1995). This plan uses the compatibility (Fowler 1995) and safety screening (Dukelow et al. 1995) DQOs as the basis for identifying data requirements and criteria for the safe storage and mixing of wastes.

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 AN-103.

2.5.2 Pretreatment/Vitrification

Tank AN-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 be done on the samples.

2.6 HISTORICAL MODEL EVALUATION

Bounding tanks and data requirements for historical model evaluations are found in *Historical Model Evaluation Data Requirements* (Simpson and McCain 1995). Tank AN-103 is not identified as a primary bounding tank for historical model evaluations.

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.

4.0 PRIORITY OF INFORMATION REQUIREMENTS

Push mode core sampling is scheduled for October 1996. Vapor sampling has not been scheduled as of April 1996 (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 -Hazardous Vapor DQO | Steel canisters, Triple Sorbent Traps, Sorbent Trap Systems. | Flammable Gas Organic Vapors Permanent Gases |
| Push Mode Core Sampling | -Safety Screening DQO -Flammable Gas DQO | Core samples from 2 risers separated radially to the maximum extent possible (Grab samples may be used to obtain supernate. Combustible Gas Measurement | Flammability, Energetics, Moisture, Total alpha activity, Anions, Metals, Radionuclides, Density, Physical properties, pH, Total Organic Carbon, Total Inorganic Carbon, Cr(VI). |

* 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 push mode core sampling event for tank AN-103 in February 1997. This time may be altered if the sampling schedule changes.

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, *Historical Tank Content Estimate for the Southeast Quadrant of the Hanford 200 East Areas*, WHC-SD-WM-ER-350, 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, Richland, Washington.
- Fowler, K.D., 1995, *Data Quality Objectives for Tank Farms Waste Compatibility Program*, WHC-SD-WM-DQO-001, Rev. 1, 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*,
- 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.
- McDuffie, N. G., 1995, *Flammable Gas Tank Safety Program: Data Requirements for Core Sample Analysis Developed Through the Data Quality Objectives (DQO) Process*, WHC-SD-WM-DQO-004, 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.
- Mulkey, C. H., and J. M. Jones, 1995, *Double-Shell Tank System Waste Analysis Plan*, WHC-SD-WM-EV-053, Rev 3, Westinghouse Hanford Company, Richland, Washington.
- Osborne, J. W., and L. L. Buckley, 1995, *Data Quality Objectives for Tank Hazardous Vapor Safety Screening*, WHC-SD-WM-DQO-002, Rev. 2, Westinghouse Hanford Company, Richland, Washington.

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Price, D. N., 1994, *Rotary Core Vapor Sampling Data Quality Objective*, WHC-SD-WM-SP-003, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

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.

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