Department of Energy
Richland Operations Office
P.O. Box 550
Richland, Washington 99352

JUL 31 1997

97-WSD-180

The Honorable John T. Conway
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue N.W., Suite 700
Washington, D.C. 20004

Dear Mr. Chairman:

TRANSMITTAL OF THE DEFENSE NUCLEAR FACILITIES SAFETY BOARD (DNFSB) RECOMMENDATION 93-5 IMPLEMENTATION PLAN (IP) QUARTERLY REPORT FOR APRIL THROUGH JUNE 1997

The DNFSB 93-5 Quarterly Report for April through June 1997 is attached (Attachment 1). This quarterly report addresses issues and milestones as presented in the Recommendation 93-5 IP, Revision 1.

The U.S. Department of Energy (DOE), Richland Operations Office (RL) staff have completed several significant technical achievements this quarter. RL staff have reviewed and approved the Authorization Basis change request for Rotary Mode Core Sampling (RMCS) in Flammable Gas Tanks submitted by the contractor. Approval of this change request provides authorization of controls for RMCS which are consistent with similar tank farm operations authorized under the Justification for Continued Operation and Standing Orders. In addition, RL has concluded that two changes to the High Priority Tank (HPT) List are appropriate at this time. One is the addition of tank U-103 to the HPT List, per DNFSB request. The other is the deletion of tank TY-103 from the list. The reason for the deletion is that the information from TY-103 was intended to close the ferrocyanide issue. With the closure of the ferrocyanide issue in December 1996, this information is no longer needed. RL has kept your staff informed of the need for these changes.

Attachment 2 (Change 2, dated July 15, 1997) documents the changes to the HPT List, as discussed above, in Recommendation 93-5 IP, Revision 1. Change 2 is intended to replace a previous change to the HPT List which was submitted with the 93-5 Quarterly Report for October through December 1996. The page changes included in Attachment 2 should be inserted into all copies of the IP to keep it up to date.

Section 6 of RL's IP allows for changes, such as those proposed in Change 2, as part of the quarterly reporting process. RL is providing you notification of this change with the attached quarterly report.

If you have any questions, please contact me, or your staff may contact Jackson Kinzer, Assistant Manager for the Office of Tank Waste Remediation System, on (509) 376-7591.

Sincerely,

John D. Wagoner
Manager

WSD:JMC

Attachments (2)

cc w/attachs:
J. Owendoff, EM-2
C. Peabody, EM-4
R. Erickson, EM-38
K. Lang, EM-38
M. Whitaker, S-3.1

cc w/o attachs:
T. J. Kelley, LMHC
M. A. Payne, LMHC

cc w/attachs:
L. D. Pennington, LMHC

DNFSB 93-5 QUARTERLY REPORT, APRIL 1 TO JUNE 30, 1997

EXECUTIVE SUMMARY

Significant accomplishments this quarter included completion of three milestones, final approval of the Basis for Interim Operations and a Readiness Assessment plan for the transition from the Interim Safety Basis to the Basis for Interim Operations, core sampling productivity improvements, production implementation of the Inductively Coupled Plasma / Mass Spectrometer at 222-S Laboratory, and resumption of full laboratory production at the 222-S Laboratory following implementation of corrective actions for the findings from a Washington State Department of Ecology audit.

The current issues discussed are the resumption of rotary mode core drilling, the status of the Final Safety Analysis Report (FSAR), the status of the High Heat Safety Issue milestones, and submittal of a revised Change 2 to the Implementation Plan.

Resuming rotary mode core sampling was delayed by design issues related to compliance of the exhauster with the flammable gas requirements of the Safety Assessment. A modification to those requirements that are not unique to the Rotary Mode Core System to bring them into line with the requirements of the Flammable Gas Justification for Continued Operation and the Basis for Interim Operation has been approved by the Department of Energy. This approval should permit rotary mode core drilling to be resumed during the next quarter.

Milestone 5.4.3.1d, "Approved FSAR," due June 1997, was not submitted. This delay is the result of focusing resources on the Basis for Interim Operation completion and implementation. The current estimated milestone completion date is March 1998.

Change 2 to the Implementation Plan has been rewritten and is attached to this Quarterly Report forwarding letter. This change revises the High Priority Tank list by adding tank U-103 and removing tank TY-103.

DNFSB 93-5 QUARTERLY REPORT, APRIL 1 TO JUNE 30, 1997

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DNFSB 93-5 QUARTERLY REPORT, APRIL 1 TO JUNE 30, 1997

1 PURPOSE

This quarterly report covers High Level Waste Tank Characterization activities at the Hanford Site related to the Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-5 during the period April 1 to June 30, 1997. The Recommendation dealt with insufficient technical information to ensure safe storage, operation, retrieval, and disposal of the Hanford high-level tank wastes in both single and double-shell tanks. An Implementation Plan responding to Recommendation 93-5 was transmitted to the DNFSB by the Secretary of Energy in January 1994. The plan was accepted by the DNFSB on March 25, 1994. On June 17, 1996, Revision 1 to the Implementation Plan was submitted to the DNFSB. Revision 1 was accepted by the DNFSB on September 4, 1996 with comments.

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2 QUARTERLY HIGHLIGHTS

2.1 Milestones Submitted - The following milestones were completed during this quarter:

2.1.1 5.4.3.5l, "Letter reporting refinement of flammable gas generation/retention models using void meter and retained gas sampling data," due May 31, 1997, completed May 27, 1997.

2.1.2 5.6.3.1d, "Updated HTCEs," due June 30, 1997, completed June 6, 1997.

2.1.3 5.4.3.3a, "Letter reporting completion of supporting technical document on Organic Complexant Safety Issue. (This topical report will describe the current understanding of the issue and future work for resolution)," due December 31, 1996, completed June 27, 1997.

2.2 Basis for Interim Operations (BIO) Approval - The Department of Energy Richland Operations Office (DOE/RL) gave final approval to the BIO and related Technical Safety Requirements (TSRs) on May 30, 1997. The contractor will implement the BIO and TSRs and will complete a Readiness Assessment within 90 days of this approval.

2.3 Core Sampling Productivity Improvements - This quarter, a total of 21 core samples were completed. The monthly average of seven cores per month is the highest rate ever achieved. This productivity improvement resulted from increased truck availability and operations performance.

2.4 222-S Ecology Audit Update - As reported last quarter, a Washington State Department of Ecology audit during February 1997 outlined problems with waste storage and disposal in the 222-S Laboratory. A plan to revise the necessary procedures and train personnel in response to the issues raised by the State was implemented in April and full production capability was restored to the laboratory.

2.5 Inductively Coupled Plasma / Mass Spectrometer (ICP/MS) at 222-S Laboratory - The ICP/MS was made available for routine analysis of samples this quarter at the 222-S Laboratory. This instrument broadens our ability to conduct elemental and isotopic analysis of liquefied samples. The use of this technique adds to the laboratory's capability to perform isotopic characterization required to support the disposal mission. The first tanks to be characterized using ICP/MS will be SY-102 and SY-103.

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3 CURRENT ISSUES

3.1 Resumption of Rotary Core Drilling - As reported to the DNFSB by letter (Wagoner 1997a) and by the last quarterly report, the resumption of Rotary Mode Core System (RMCS) operation was delayed by lack of compliance of the exhauster with the flammable gas safety requirements of the RMCS Safety Assessment (Hamilton 1996). An engineering review determined that full Safety Assessment compliance would require a major redesign of the exhauster. This would have been costly and add about nine additional months delay in deploying RMCS. In addition, it was recognized that the requirements of the RMCS Safety Assessment were not consistent with the flammable gas control requirements for most other Tank Waste Remediation System (TWRS) activities imposed by the Flammable Gas Justification for Continued Operation (JCO). Consequently, the contractor submitted a request to replace the flammable gas controls for RMCS, that are not unique to the RMCS, with those from the Flammable Gas JCO. This request has been approved by DOE/RL. This approval, and the expected resolution of issues concerning the exhauster air emissions permit from the Washington State Department of Health, will allow RMCS operations to start during the next quarter. These issues and the estimated schedule impacts will continue to be updated during weekly conference calls.

3.2 Final Safety Analysis Report (FSAR) - Milestone 5.4.3.1d, "Approved FSAR," due June 1997, was not submitted on time. This delay is the result of incorporating additional controls into the BIO to reduce risk and focusing resources on BIO completion and implementation. Additional details on this delay were provided by letter (Wagoner 1997b). The current estimated milestone completion date is March 1998.

3.3 High Heat Safety Issue - Last quarter the three milestones related to the High Heat Safety Issue were reported to be behind schedule. Milestone 5.4.3.6b, "Letter reporting completion of tank C-106 retrieval safety assessment," due July 1997, will be delayed until September 1997. The cause of the delay was the need for additional evaluation to resolve new issues with flammability and steam bump. Completion dates for the other two milestones will be submitted when the safety assessment is approved.

3.4 Implementation Plan Change 2 - Change 2 to the Implementation Plan has been rewritten and is attached to this Quarterly Report forwarding letter. Discussions with the DNFSB Staff resulted in agreement that only two tanks, U-103 and TY-103, provided strong technical justification for revising the High Priority Tank (HPT) list. Tank U-103 is important to both the flammable gas program for sampling using the retained gas sampler (completed April 9, 1997), and to the organic fuel safety issue. The DNFSB letter of acceptance for Revision 1 to the Implementation Plan (Conway 1996a) also recommended that U-103 should be placed on the HPT list. Tank TY-103 is removed from the HPT list by this change. The priority for sampling this tank was based solely on information needs for the ferrocyanide safety program. The ferrocyanide safety issue was closed in December 1996 (Conway 1996b, Wagoner 1996). As discussed in the last Quarterly Report, a revised schedule for HPT core sampling is not included, and will be provided when the RMCS has been deployed and operational experience obtained with the modified equipment configuration.

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4 STATUS OF REVISION 1 MILESTONES OVERDUE, DUE WITHIN SIX MONTHS, OR COMPLETED DURING THE REPORTING QUARTER

4.1 Safe Storage of Tank Wastes and Safe Operation of Tank Farms

Commitment Number

5.4.3.1 TWRS Manage Tank Waste Function Authorization Basis

Statement: Upgrade the Authorization Basis for the TWRS Manage Tank Waste Function

Responsible Manager: Assistant Manager, TWRS

Applicable facilities and programs: TWRS

Milestone deliverables/due dates:

d. Approved FSAR.

Due Date: June 1997

Status: Overdue. Delayed by BIO revision and implementation. The estimated milestone completion date is March 1998.

5.4.3.3 Organic Complexants

Statement: Complete testing and evaluation confirming simulant results with real waste.

Responsible Manager: Assistant Manager, TWRS

Applicable facilities and programs: TWRS

Milestone deliverables/due dates:

a. Letter reporting completion of supporting technical document on Organic Complexant Safety Issue. (This topical report will describe the current understanding of the issue and future work for resolution).

Due Date: December 1996

Status: Complete. Submitted to the DNFSB on June 27, 1997.

5.4.3.5 Flammable Gas

Statement: Complete analytical evaluations and steady-state vapor samples to determine which flammable gas tanks require mitigative actions. Qualify saltwell pumping and rotary-mode core sampling for flammable gas environments.

Responsible Manager: Assistant Manager, TWRS

Applicable facilities and programs: TWRS

Milestone deliverables/due dates:

d. Letter reporting qualification of Rotary Mode Core Sampling System for use in Flammable Gas Tanks.

Due Date: September 1996

Status: Overdue. Adoption of the BIO flammable gas controls for the RMCS controls that are not unique to the Rotary Mode Core System has been approved by DOE/RL. Approval allows exhauster operation without major modifications. Start of rotary mode core sampling is expected during the next quarter.

l. Letter reporting refinement of flammable gas generation/retention models using void meter and retained gas sampling data.

Due Date: May 1997

Status: Complete. Reported to the DNFSB on May 27, 1997.

5.4.3.6 High Heat

Statement: Retrieve wastes from tank C-106.
Responsible Manager: Assistant Manager, TWRS
Applicable facilities and programs: TWRS
Milestone deliverables/due dates:

b. **Letter reporting completion of tank C-106 retrieval safety assessment.**
Due Date: July 1997
Status: Behind schedule. Submittal to DNFSB delayed until September 1997 to allow for independent review and approval process.

c. **Letter reporting initiation of tank C-106 waste retrieval.**
Due Date: October 1997
Status: Behind schedule. Equipment modifications will be delayed until the safety assessment is approved (previously scheduled in parallel) to eliminate the risk of potential rework caused by safety assessment changes.

4.2 Technical Basis for Characterization

5.6.3.1 Complete Tank Waste Characterization Basis Sampling and Analysis

Statement: Complete the sampling and analysis specified by the Tank Waste Characterization Basis (approximately 28 tanks) to provide the highest priority information requested by the programmatic DQOs.
Responsible Manager: Assistant Manager, TWRS
Applicable facilities and programs: TWRS
Milestone deliverables/due dates:

d. **Updated HTCEs.**
Due Date: June 1997
Status: Complete. Reported to the DNFSB on June 6, 1997.

e. **Letter reporting verification of headspace homogeneity and evaluation of variations in headspace vapor concentrations in passively ventilated tanks with changing atmospheric temperatures.**
Due Date: October 1997
Status: On schedule.

f. **Standard inventory estimates for all tanks.**
Due Date: November 1997
Status: On schedule.

5 REFERENCES

Conway, J. T., 1996a, (letter to H. R. O'Leary, DOE, September 4), Defense Nuclear Facilities Safety Board, Washington, District of Columbia.

Conway, J. T., 1996b, (letter to A. L. Alm, DOE, December 17), Defense Nuclear Facilities Safety Board, Washington, District of Columbia.

Hamilton, D. W., 1996, *A Safety Assessment for Rotary Mode Core Sampling in Flammable Gas Single Shell Tanks, Hanford Site, Richland, Washington*, WHC-SD-WM-SAD-035, Rev. 0-a, Westinghouse Hanford Corporation, Richland, Washington.

Wagoner, J. D., 1996, Contract Number DE-AC06-96RL13200; *Approval to Revise the Interim Safety Basis to Remove Ferrocyanide Tanks from the Watch List*, (letter to H. J. Hatch, Fluor Daniel Hanford, Inc., December 30), Department of Energy, Richland Operations Office, Richland, Washington.

Wagoner, J. D., 1997a, *Completion of Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-5 Implementation Plan (IP), Revision 1, Milestone 5.4.3.5.d, "Letter Reporting Qualification of Rotary Mode Core Sampling System for Use in Flammable Gas Tanks,"* (letter to J. T. Conway, DNFSB, 97-WSD-066, April 4), Department of Energy, Richland Operations Office, Richland, Washington.

Wagoner, J. D., 1997b, *Delay in Completing Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 93-5 Implementation Plan (IP), Revision 1, Milestone 5.4.3.1.d, Approved Tank Waste Remediation System (TWRS) Final Safety Analysis Report (FSAR),"* (letter to J. T. Conway, DNFSB, 97-MSD-203, June 13), Department of Energy, Richland Operations Office, Richland, Washington.

6 APPENDICES

6.1 High Priority Tank Core Sampling and Analysis Status

Tank	Rank	Planned Samples	Samples Obtained	Sampling Completed	Lab Analysis Completed	Tank Characterization Report (TCR)
U-103	100	3P	3 cores, 1 RGS core	4/9/97		
BY-105	100	2R	1 partial rotary and push core.			WHC-SD-WM-ER-598
U-105	93	3R	3 cores	3/18/96	6/25/96	WHC-SD-WM-ER-617
U-109	91	3R	3 cores	1/19/96	6/29/96	WHC-SD-WM-ER-609
BY-103	86	2R				
U-108	84	3R	3 cores	5/6/96	11/6/96	HNF-SD-WM-ER-639
U-107	76	3R	3 partial push cores. Need rotary.			WHC-SD-WM-ER-614
BY-106	74	2R	2 cores	12/19/95	4/29/96	WHC-SD-WM-ER-616
S-102	74	2R	2 cores	3/8/96	7/12/96	WHC-SD-WM-ER-611
SX-103	67	2R				
BY-108	65	3R	3 cores	8/18/95	2/12/96	WHC-SD-WM-ER-533
A-101	62	3R	2 RGS cores	7/25/96	5/5/97	HNF-SD-WM-ER-673
TX-118	61	3R				
SX-104	61	3R				
BY-110	52	3R	9 cores	10/20/95	4/25/96	WHC-SD-WM-ER-591
TX-111	51	2R				
BY-104	51	2R	2 cores	11/15/95	5/2/96	WHC-SD-WM-ER-608
C-104	50	2R	2 cores	7/31/96	1/10/97	HNF-SD-WM-ER-679
S-107	50	3P	3 cores	9/30/95	3/15/96	WHC-SD-WM-ER-589
S-101	50	2R	2 cores	4/3/96	7/23/96	WHC-SD-WM-ER-613
SX-101	49	2R				
S-110	47	2R	1 partial push core. Need rotary.			
AW-101	47	2P	2 RGS cores	5/24/96	12/6/96	WHC-SD-WM-ER-470
AN-104	46	2P	2 RGS cores	9/12/96	6/5/97	
AX-101	43	3R				
AN-105	37	2P	2 RGS cores	6/28/96	1/24/97	HNF-SD-WM-ER-678
AN-103	36	2P	2 RGS cores	9/23/96	5/19/97	
B-104	15	2P	2 cores	6/14/95	10/1/95	WHC-SD-WM-ER-552

Notes:

P = push mode core sample
R = rotary mode core sample
RGS = Retained Gas Sample (RGS). RGS can only be used with truck #1 (push mode truck).

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6.2 Tanks Sampled during Third Quarter FY 1997 (April through June 1997)

SAMPLE	Actual Start	Actual Finish
BX-104 Temporal Vapor Sample (4) High Priority	4/7/97	4/7/97
SX-104 Grab Sample Compatibility	4/9/97	4/9/97
U-103 Push Samples 1 Segments 9 RGS High Priority	3/25/97	4/9/97
T-204 Rotary Samples 1 Segments 10	3/24/97	4/14/97
T-203 Rotary Samples 1 Segments 9	4/14/97	4/18/97
AY-101 Grab Sample - Caustic Verification	4/21/97	4/22/97
T-202 Rotary Samples 1 Segments 6	4/18/97	4/22/97
T-201 Rotary Samples 1 Segments 9	4/22/97	4/25/97
AW-106 Grab Sample	5/1/97	5/1/97
TX-104 Vapor Sample (4)	5/5/97	5/5/97
AW-103 Push Sample 2 Segments 4-10	4/28/97	5/8/97
AW-105 Rotary Sample 2 Segments 4-9	5/8/97	5/14/97
SX-107 Vapor Sample (4) Rotary	5/19/97	5/19/97
BX-110 Rotary Samples 2 Segments 5	5/15/97	5/22/97
SX-111 Vapor Sample (4) Rotary	5/22/97	5/22/97
244-TX Grab Sample Compatibility	5/28/97	5/29/97
BY-101 Push Samples 2 Segments 8	5/21/97	5/30/97
SX-103 Grab Sample Compatibility	6/6/97	6/6/97
BX-104 Temporal Vapor Sample (4) High Priority	6/10/97	6/10/97
BX-111 Rotary Samples 2 Segments 4	5/28/97	6/10/97
BY-109 Push Samples 2 Segments 7	6/4/97	6/17/97
SX-112 Vapor Sample (4) Rotary	6/18/97	6/19/97
AW-104 Rotary Samples 2 Segments 15-22	6/16/97	6/25/97
SX-114 Vapor Sample (4) Rotary	6/25/97	6/25/97
T-105 Push Sample 2 Segments 2	6/19/97	6/30/97

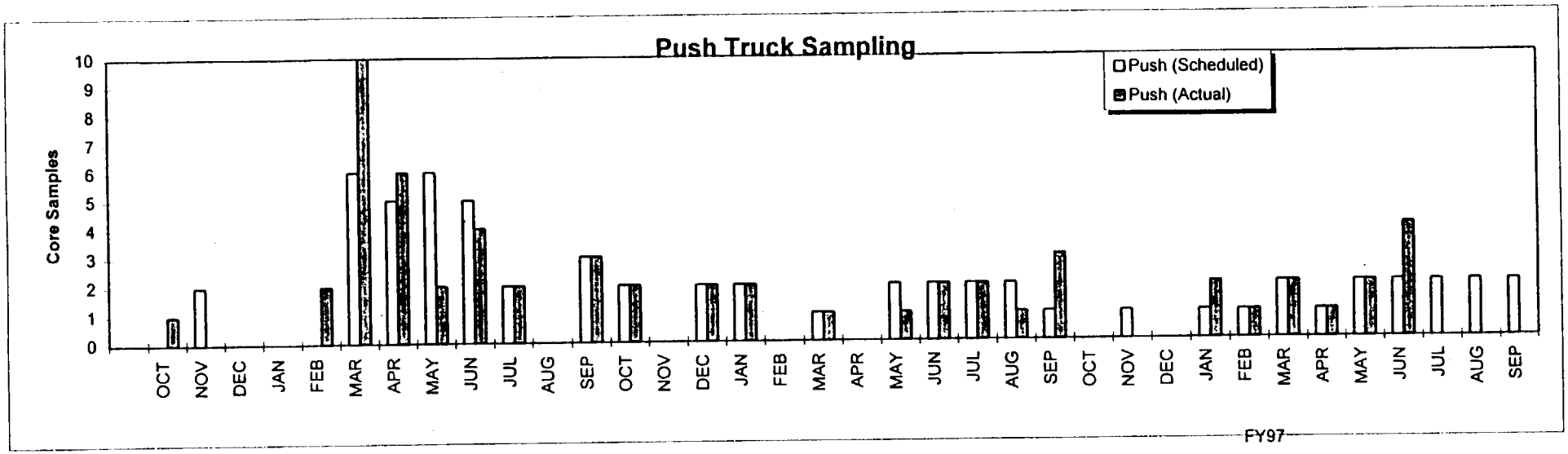
6.3 Chart of Samples Taken vs. Samples Scheduled

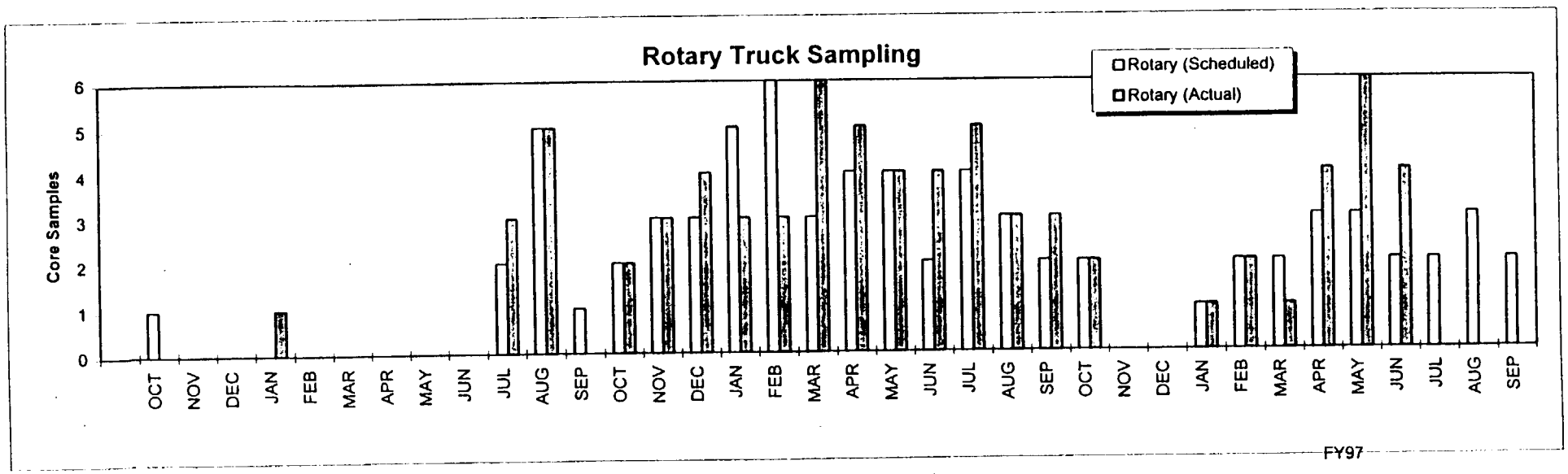
Two pages inserted following this page.

T·W·R·S Tank Waste Remediation System

Characterization

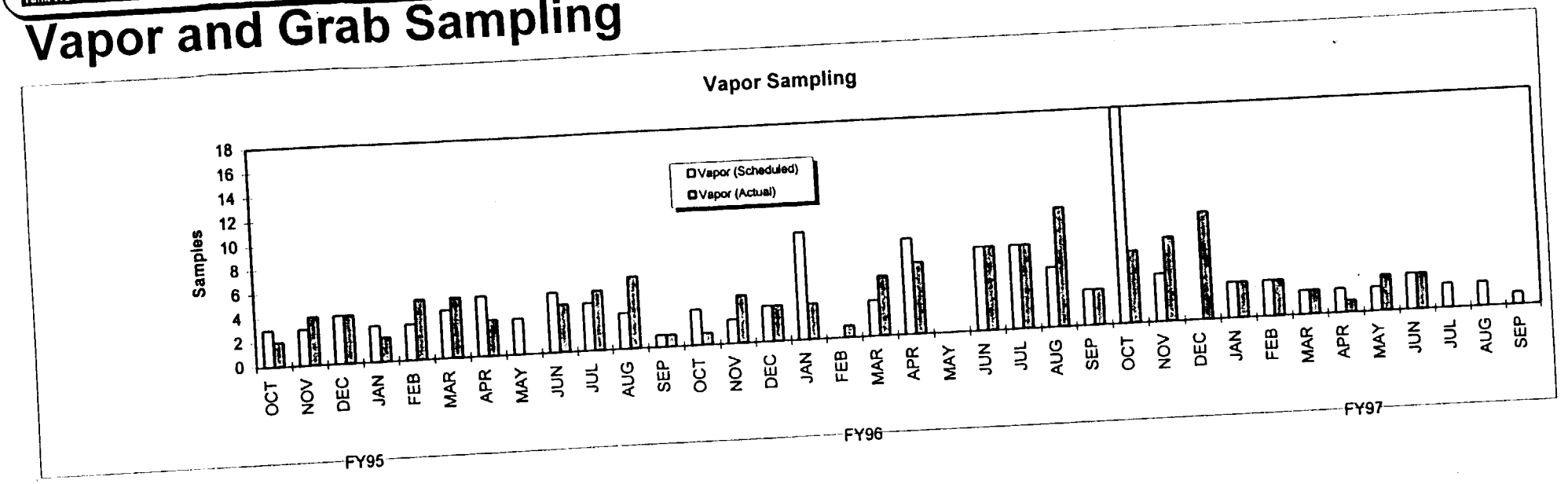
Push and Rotary Sampling

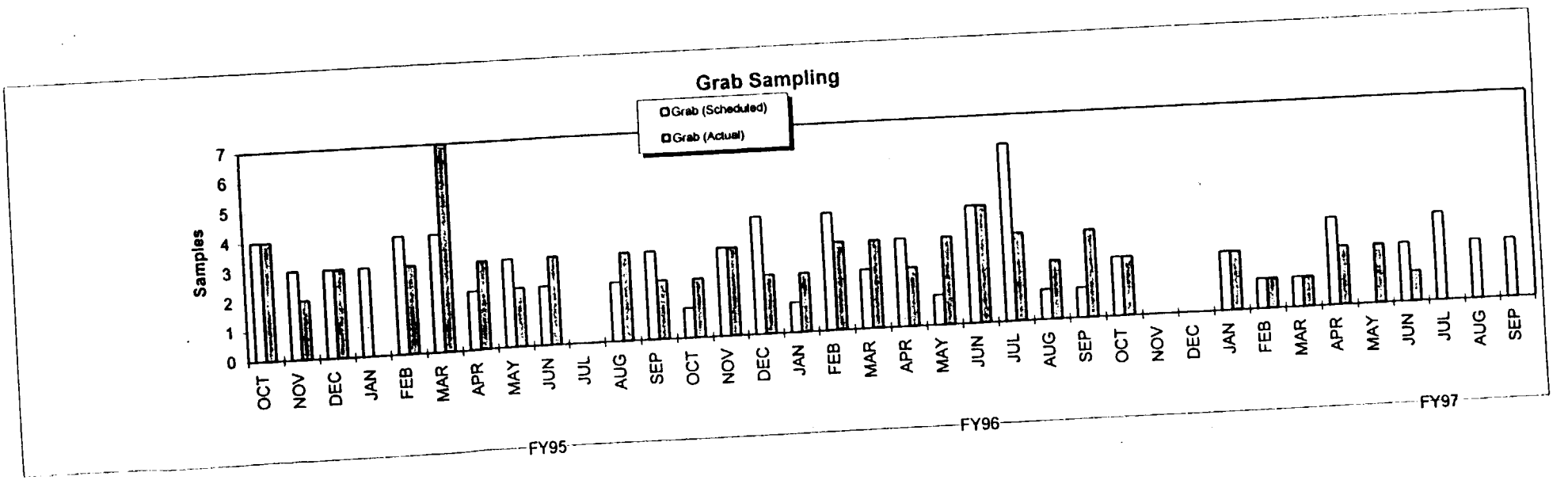




Characterization

Vapor and Grab Sampling





6.4 Sampling Schedule for Fourth Quarter FY 1997 (July through September 1997)

TITLE	Early Start	Early Finish
T-105 Push Sample 2 Segments 2	6/20/97	7/7/97
AP-105 Push Sample 2 Segments 2-4	6/30/97	7/15/97
SY-102 Push Sample 2 Segments 12-13	7/8/97	7/28/97
TX-302-C Grab Sample Compatibility	7/14/97	7/16/97
AX-103 Rotary Samples 2 Segments 3	7/16/97	8/12/97
SX-110 Vapor Sample (4) (Rotary)	7/17/97	7/18/97
AX-101 Grab Sample Compatibility	7/21/97	7/23/97
AP-103 Grab Sample (Caustic Verification)	7/28/97	7/30/97
SX-101 Rotary Samples 2 Seg 9 High Priority	7/28/97	8/28/97
SY-103 Push Samples 1 Segments 15	7/29/97	8/18/97
SX-108 Vapor Sample (4) (Rotary)	7/31/97	8/1/97
AZ-101 Grab Sample	8/11/97	8/13/97
C-201 Rotary Sample 1 Segments 1	8/13/97	8/19/97
TX-113 Vapor Sample (4) (Rotary)	8/14/97	8/15/97
B-107 Push Samples 2 Segments 3	8/19/97	9/16/97
C-202 Rotary Sample 1 Segments 1	8/20/97	8/26/97
AP-106 Grab Sample - (98-1 Compatibility)	8/25/97	8/27/97
TX-110 Vapor Sample (4) (Rotary)	8/28/97	8/29/97
SX-103 Rotary Samples 2 Seg 13 High Priority	8/29/97	10/2/97
SY-102 Grab Sample - (98-1 Compatibility)	9/2/97	9/4/97
TX-109 Rotary Samples 2 Segments 8	9/4/97	10/1/97
SX-102 Rotary Samples 2 Segments 11	9/8/97	10/9/97
SX-102 Grab Sample Compatibility	9/9/97	9/11/97
SX-105 Grab Sample Compatibility	9/12/97	9/16/97
TX-116 Vapor Sample (4) (Rotary)	9/12/97	9/15/97

6.5 List of Tank Sampling and Analysis Plans issued during the Quarter

Tank	Number	Rev	Date
AW-103	HNF-SD-WM-TSAP-131 (Push Mode)	0	04/29/97
AW-104	HNF-SD-WM-TSAP-139 (Push Mode)	0	06/16/97
AW-105	HNF-SD-WM-TSAP-132 (Push Mode)	0 1	05/01/97 06/24/97
AX-101	WHC-SD-WM-TSAP-107 (Rotary Mode)	0-B	05/21/97
AY-101	HNF-SD-WM-TSAP-129 (Grab)	0 0-A	04/11/97 04/28/97
BX-104	HNF-SD-WM-TP-522 (Vapor Sampling and Analysis Plan/Test Plan for Temporal Studies of Tanks BX-104, BY-108, C-107 and S-102)	1	05/28/97
BX-111	HNF-SD-WM-TSAP-135 (Push Mode)	0	05/22/97
BY-101	HNF-SD-WM-TSAP-128 (Push Mode)	0	05/06/97
BY-109	HNF-SD-WM-TSAP-133 (Push Mode)	0	06/04/97

Tank	Number	Rev	Date
C-107	HNF-SD-WM-TP-522 (Vapor Sampling and Analysis Plan/Test Plan for Temporal Studies of Tanks BX-104, BY-108, C-107 and S-102)	1	05/28/97
S-106	HNF-SD-WM-TSAP-124 (Push Mode)	0-C	06/19/97
T-105	HNF-SD-WM-TSAP-134 (Push Mode)	0 0-A 0-B	05/29/97 06/04/97 06/19/97
T-201	HNF-SD-WM-TSAP-130 (Push Mode)	0	04/22/97
T-202	HNF-SD-WM-TSAP-121 (Push Mode)	0-A	05/20/97
U-103	HNF-SD-WM-TSAP-097 (Push Mode)	1-B	06/11/97
*	WHC-SD-WM-TSAP-115 * Compatibility Grab Sampling and Analysis Plan for Fiscal Year 1997	0-D 0-E 0-F	04/02/97 05/12/97 05/20/97
*	HNF-SD-WM-TSAP-126 * Vapor Sampling and Analysis Plan	0-B	04/29/97

6.6 List of Tank Characterization Reports issued during the Quarter

Tank	Number	Rev	Date
A-101	HNF-SD-WM-ER-673	0	05/27/97
AN-105	HNF-SD-WM-ER-678	0	05/02/97
AP-101	HNF-SD-WM-ER-357	1	06/24/97
AP-102	HNF-SD-WM-ER-358	1	01/28/97
AP-103	HNF-SD-WM-ER-359	1	01/21/97
AP-105	HNF-SD-WM-ER-360	1	05/22/97
AW-102	HNF-SD-WM-ER-363	1	05/30/97
AW-105	HNF-SD-WM-ER-364	1	06/05/97
AW-106	HNF-SD-WM-ER-365	1	05/02/97
B-108	HNF-SD-WM-ER-674	0 0-A	05/12/97 05/20/97
B-109	HNF-SD-WM-ER-677	0	05/30/97
BY-107	HNF-SD-WM-ER-637	0	04/09/97
C-104	HNF-SD-WM-ER-679	0	05/21/97
C-109	HNF-SD-WM-ER-402	1 1-A	05/23/97 06/17/97
C-110	HNF-SD-WM-ER-367	1	06/24/97
C-112	HNF-SD-WM-ER-541	1	06/10/97
S-104	HNF-SD-WM-ER-370	1	04/15/97
S-109	HNF-SD-WM-ER-627	0-A	05/29/97
S-111	HNF-SD-WM-ER-638	0	04/28/97
T-102	HNF-SD-WM-ER-700	0	06/24/97
U-106	HNF-SD-WM-ER-636	0	04/15/97

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6.7 List of Laboratory Analytical Reports Issued

Tank	Title	Number	Date
A-101	Tank 241-A-101, Cores 154 and 156 Analytical Results for the Final Report	HNF-SD-WM-DP-200, Rev. 1	05-05-97
AN-103	Tank 241-AN-103, Cores 166 and 167 Analytical Results for the Final Report	HNF-SD-WM-DP-223, Rev. 0	05-19-97
AN-104	Tank 241-AN-104, Cores 163 and 164 Analytical Results for the Final Report	HNF-SD-WM-DP-226, Rev. 0	06-05-97
AN-104	Tank 241-AN-104, Cores 163 and 164 Analytical Results for the Final Report	HNF-SD-WM-DP-226, Rev. 0A	06-09-97
AN-105	Tank Waste Remediation System (TWRS) Privatization Private Contractor Samples Waste Envelope B Material Tank 241-AN-105	HNF-SD-WM-DP-218, Rev. 0	04-15-97
AN-105	Tank Waste Remediation System (TWRS) Privatization Private Contractor Samples Waste Envelope B Material Tank 241-AN-105	HNF-SD-WM-DP-218, Rev. 0A	05-22-97
AN-105	Tank Waste Remediation System (TWRS) Privatization Private Contractor Samples Waste Envelope B Material Tank 241-AN-105	HNF-SD-WM-DP-218, Rev. 1	06-13-97
AN-107	Tank Waste Remediation System (TWRS) Privatization Private Contractor Samples Waste Envelope C Material Tank 241-AN-107	HNF-SD-WM-DP-205, Rev. 1	04-09-97
AP-103	Tank 241-AP-103, Grab Sample 3AP-97-1 Analytical Results for the Final Report	HNF-SD-WM-DP-241, Rev. 0	04-23-97
B-108	Tank 241-B-108, Cores 172 and 173 Analytical Results for the Final Report	HNF-SD-WM-DP-219, Rev. 0B	04-21-97
BY-111	Tank 241-BY-111, Cores 168 and 171 Analytical Results for the Final Report	HNF-SD-WM-DP-203, Rev. 0	05-05-97
BY-112	Tank 241-BY-112, Cores 174 and 177 Analytical Results for the Final Report	HNF-SD-WM-DP-229, Rev. 0	05-07-97
C-106	Tank Waste Remediation System (TWRS) Privatization Private Contractor Samples Waste Envelope D Material 241-C-106	HNF-SD-WM-DP-225, Rev. 1	04-14-97
T-110	Waste Compatibility Safety Issues and Final Results for Tank 241-T-110 Push Mode Samples	HNF-SD-WM-DP-238, Rev. 0	05-15-97
T-110	Waste Compatibility Safety Issues and Final Results for Tank 241-T-110 Grab Samples	HNF-SD-WM-DP-239, Rev. 0	4-25-97
T-112	Tank 241-T-112, Cores 185 and 186 Analytical Results for the Final Report	HNF-SD-WM-DP-243, Rev. 0	06-03-97

6.8 Table of DNFSB 93-5 Implementation Plan Revision 1 Commitments Status

Number	Description	Due Date	Submitted to DNFSB
5.4.3.1a	Comprehensive Source Terms Report	6/30/96	6/30/96
5.4.3.1b	Report on Lightning Evaluation	8/31/96	8/30/96
5.4.3.1c	Approved BIO	12/31/96	12/30/96
5.4.3.1d	Approved FSAR.	6/30/97	
5.4.3.2a	Topical Report on Resolution of Ferrocyanide Safety Issue.	1/31/97	9/23/96

DNFSB 93-5 QUARTERLY REPORT, APRIL 1 TO JUNE 30, 1997

Number	Description	Due Date	Submitted to DNFSB
5.4.3.3a	Supporting Technical Document on Organic Complexant Safety Issue	12/31/96	6/27/97
5.4.3.3b	Confirm Safe Storage Criteria, and Organic Solubility and Aging Effects on Fuel Content	11/30/98	
5.4.3.4a	Safety Assessment Covering Pool and Entrained Organic Solvent Fires	10/31/96	10/21/96
5.4.3.4b	Organic Speciation of Core Samples for BY-108 and BY-110, and Auger Samples for C-102.	10/31/96	10/31/96
5.4.3.4c	Supporting Technical Document for Organic Solvent Safety Issue.	12/31/96	12/23/96
5.4.3.4d	Vapor Sampling of all SSTs.	12/31/99	
5.4.3.4e	Adequate Vent Path in All SSTs Suspected of Containing Organic Solvents	4/30/00	
5.4.3.4f	Letter Reporting Completion of Vapor Sampling of All DSTs.	12/31/00	
5.4.3.5a	Analyses to Determine If Additional Tanks Have Potential to Exceed 25% of the LFL.	6/30/96	6/28/96
5.4.3.5b	Gas Monitoring Instrumentation Upgrade Needs for Additional Tanks with the Potential to Exceed 25% of the LFL.	8/31/96	8/19/96
5.4.3.5c	Safety Assessment for Rotary Mode Core Sampling in Flammable Gas Tanks	9/30/96	9/27/96
5.4.3.5d	Qualification of Rotary Mode Core Sampling System for Use in Flammable Gas Tanks.	9/30/96	
5.4.3.5e	Safety Assessment for Saltwell Pumping in Flammable Gas Tanks	10/31/96	10/31/96
5.4.3.5f	Letter Reporting Completion of AN Tank Farm Ventilation Upgrade.	11/30/96	1/30/97
5.4.3.5g	Flammable Gas Safety Screening of Remaining Passively Ventilated SSTs	11/30/96	11/12/96
5.4.3.5h	Supporting Technical Document on Flammable Gas Safety Issue.	12/31/96	1/30/97
5.4.3.5i	External Equipment Spark Sources in Flammable Gas Tanks	12/31/96	12/24/96
5.4.3.5j	Voidmeter and Viscometer Readings in Tanks AN-103, AN-104, and AN-105.	12/31/96	12/18/96
5.4.3.5k	Retained Gas Sampling in Tanks AW-101, AN-103, AN-104, AN-105, and A-101.	3/31/97	3/28/97
5.4.3.5l	Refinement of Flammable Gas Generation/Retention Models	5/31/97	5/27/97
5.4.3.6a	C-106 Supernatant Sampling and Analysis.	10/31/96	10/30/96
5.4.3.6b	C-106 Retrieval Safety Assessment.	7/31/97	
5.4.3.6c	Initiation of Tank C-106 Waste Retrieval.	10/31/97	
5.4.3.6d	Topical Report to Resolve the High Heat Safety Issue.	5/31/98	
5.4.3.7a	Topical Report to Resolve the Criticality Safety Issue.	12/31/96	12/18/96
5.5.6.1a	Completion of High Priority Tanks Sampling and Analysis for the Disposal Program	3/31/98	
5.6.3.1a	Comparison Between Truck and Cart Vapor Sampling Systems.	9/30/96	9/27/96
5.6.3.1b	Implementation of FTIR Moisture Analysis Capability in 222-S Laboratory.	11/30/96	11/19/96
5.6.3.1c	Proposed Content and Format of Tank-by-Tank Safety Status Evaluation	1/31/97	1/30/97
5.6.3.1d	Updated HTCEs	6/30/97	6/6/97
5.6.3.1e	Verification of Headspace Homogeneity	10/31/97	
5.6.3.1f	Standard Inventory Estimates for All Tanks.	11/30/97	
5.6.3.1g	Completion of High Priority Tanks Sampling and Analysis.	3/31/98	
5.6.3.1h	Tank-by-Tank Safety Status Evaluation.	7/31/98	
5.6.3.1i	Update Tank Content Models	12/31/98	
5.6.3.1j	Completion of Core Sampling of All Tanks	12/31/02	

ATTACH 2

RECOMMENDATION 93-5 IMPLEMENTATION PLAN
DOE/RL-94-0001
CHANGE TRANSMITTAL

CHANGE 2, JULY 15, 1997

Instructions: Remove the pages listed below in the left column and insert the pages listed in the right column. Discard the pages removed. No report of entering this change is required.

Remove Pages		Insert Pages	
ii	Change 0, May 1, 1996	ii	Change 2, July 15, 1997
vi	Change 1, October 15, 1996	vi	Change 2, July 15, 1997
19	Change 0, May 1, 1996	19	Change 2, July 15, 1997
52	Change 0, May 1, 1996	52	Change 2, July 15, 1997
C-3 through C-4	Change 0, May 1, 1996	C-3 through C-4	Change 2, July 15, 1997
C-7	Change 0, May 1, 1996	C-7	Change 2, July 15, 1997
F-2 through F-4	Change 0, May 1, 1996	F-2 through F-4	Change 2, July 15, 1997
G-1 through G-6	Change 0, May 1, 1996	G-1	Change 2, July 15, 1997
I-1 through I-2	Change 0, May 1, 1996	I-1 through I-2	Change 2, July 15, 1997

Change Summary

This change updates the High Priority Tanks (HPTs) for core sampling to: 1) reflect closure of the ferrocyanide safety issue by removal of tank TY-103, and 2) recognize the designation by the flammable gas safety program of tank U-103 as a high priority for sampling with the retained gas sampler.

establish confidence intervals in historical data and meet initial Disposal Program needs.

- Continue to safety screen tanks using the Safety Screening Data Quality Objective. Sample all 177 tanks unless characterization by other methods can be technically justified.
- Qualify the Rotary Mode Core Sampling System for use in flammable gas atmospheres.
- Sample the headspace of all passively ventilated Single-Shell Tanks using combustible gas meters to determine steady-state flammable gas concentrations. This activity satisfies the highest priority safety information need.
- Sample the headspace of all tanks and screen for the presence of organic solvents.

When the sampling and analysis program associated with the High Priority Tanks (this list includes 16 of the 38 Watch List tanks) is completed, the safety issues may be resolved to the point that the subsequent characterization requirements can be significantly restructured.

The Characterization Project is working three shifts per day, five days per week, and some overtime on weekends to accelerate sampling. It is with this same sense of urgency that this strategy seeks to expedite the understanding of safety-related phenomena based on sampling the High Priority Tanks and on completing key safety assessments. This Implementation Plan will be reviewed at least annually and progress reports will be provided quarterly.

This 93-5 Implementation Plan revision meets the Department of Energy's understanding of the Board's fundamental concern that the Department of Energy provide sufficient and timely information to ensure that wastes can be safely stored and associated operations are conducted safely, and that future Disposal Program data requirements can be met. Completion of the milestones in this plan will close out the Department of Energy's actions associated with Recommendation 93-5 .

LIST OF EFFECTIVE PAGES

i	Change 0, May 1, 1996
ii	Change 2, July 15, 1997 |
iii through vi	Change 1, October 15, 1996
vi	Change 2, July 15, 1997 |
1 through 18	Change 0, May 1, 1996 |
19	Change 2, July 15, 1997 |
31 through 32	Change 1, October 15, 1996
33 through 41	Change 0, May 1, 1996
42	Change 1, October 15, 1996
43 through 51	Change 0, May 1, 1996 |
52	Change 2, July 15, 1997 |
53 through 54	Change 0, May 1, 1996 |
A-1 through A2	Change 0, May 1, 1996
B-1 through B3	Change 0, May 1, 1996
C-1 through C-2	Change 0, May 1, 1996 |
C-3 through C-4	Change 2, July 15, 1997 |
C-5 through C-6	Change 0, May 1, 1996 |
C-7	Change 2, July 15, 1997 |
D-1 through D-2	Change 0, May 1, 1996
D-3	Change 1, October 15, 1996
D-4 through D-6	Change 0, May 1, 1996
E-1 through E-6	Change 0, May 1, 1996
F-1	Change 0, May 1, 1996
F-2 through F-4	Change 2, July 15, 1997 |
G-1	Change 2, July 15, 1997 |
H-1	Change 0, May 1, 1996
I-1 through I-2	Change 2, July 15, 1997 |
I-1 through I-5	Change 0, May 1, 1996
J-1 through J-16	Change 0, May 1, 1996
Dist-1 through Dist-6	Change 1, October 15, 1996

5.3.3 Revised Tank Characterization And Safety Strategy

Significant work has been completed concerning understanding the safety issues associated with the tank waste and the need for a disposal process development program.

Reviewing this progress led to the realization that tank safety issues could not be resolved solely by accelerating sampling and analyses to improve the characterization of tank contents. The key to expediting resolution was to better understand safety-related phenomena that are the basis for the safety issues. A revised characterization and safety strategy has evolved and is presented in this Implementation Plan. The revised safety-oriented strategy is multifaceted and consists of the key elements listed below.

- Maintain tanks in an interim configuration using safety controls and, where necessary, mitigative actions.

- Upgrade and complete the Authorization Basis for the Tank Farms. This includes producing a BIO, FSAR, Technical Safety Requirements (TSRs), Compliance Implementation Plan, and Safety Evaluation Report.

- Complete the ongoing programs to resolve the ferrocyanide, organic complexants, organic solvents, flammable gas, high heat, and criticality safety issues.

- Analyze core samples from the High Priority Tanks to understand phenomena and resolve issues associated with groups of tanks.

  -- Sampling the High Priority Tanks will satisfy the highest priority core sampling.

  -- Sampling and analysis of the High Priority Tanks is intended to provide scientific and technical data to confirm assumptions, calibrate models, and measure safety-related phenomenological characteristics of the waste. The most important of these are verification of ferrocyanide decomposition, refinement of gas retention and gas release models, verification of organic complexant decomposition and solubility, and verification of simulant studies on propagation. Verification of propagation phenomena by testing real waste should confirm the conclusions drawn from simulant studies (Fauske 1996). This sampling activity will also establish confidence intervals in historical data and meet initial Disposal Program needs.

- Continue to safety screen tanks using the Safety Screening DQO. Sample all 177 tanks unless characterization by other methods can be technically justified.

- Qualify the Rotary Mode Core Sampling System for use in flammable gas atmospheres.

- Sample the headspace of all passively ventilated SSTs using combustible gas meters to determine steady-state flammable gas concentrations. This activity satisfies the highest priority safety information need.

- Sample the headspace of all tanks and screen for the presence of organic solvents.

When the sampling and analysis program associated with the High Priority Tanks (this list includes 16 of the 38 Watch List tanks) is completed, the safety issues may be resolved to the point that the subsequent characterization requirements can be significantly restructured.

Table 4: Watch List Tank Sampling Progress Under High Priority Tank Sampling Schedule

Watch List Tank Summary [4]			Watch List Tanks Sampled and Analyzed[2] Prior to Starting High Priority Tank Sampling[3]			Watch List Tanks Sampled, and Analysis Complete or in Progress[2] as of January 31, 1996			Watch List Tanks That Will Be Sampled and Analyzed[2] When High Priority Tank Sampling is Completed		
Watch List	Total[1]	HPTs	Core	Vapor	Grab	Core	Vapor	Grab	Core	Vapor	Grab
Organic	20	7	8	16	3	9	20	4	15	20	4
Flammable Gas	25	15	3	9	3	6	19	4	20	21	16
High Heat	1	0	0	1	0	0	1	0	0	1	1

Notes:

1. HPTs: the number of Watch List tanks included in the High Priority Tank (HPT) list. Six of these tanks are on two Watch Lists.

2. The term "sampled and analyzed" includes that period from removal of materials through publication of a Tank Characterization Report (TCR).

3. The sampling and analysis of several High Priority Tanks were in progress on June 1, 1995. These tanks are included in the numbers in this section, although sampling and analysis was not complete at that time.

4. The Ferrocyanide Safety Issue has been closed and all tanks have been removed from the Ferrocyanide Watchlist (Wagoner 1996).

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Table F-1: Tank Waste Characterization Basis High Priority Tanks

Waste Types:

$BiPO_4$ - Bismuth Phosphate	EB - Evaporator Bottom	TBP - Tributyl Phosphate
DSSF- *Double Shell Slurry Feed*	*PUREX - Plutonium/Uranium Extraction*	*REDOX - Reduction/Oxidation*

Table F-1: Tank Waste Characterization Basis High Priority Tanks

TANK PRIORITIZATION LIST			ISSUES		WASTE TYPE						WATCH LIST		
	Tank	Relative Value	PHENOMENON RELATED	COMPOSITION RELATED	$BiPO_4$	EB	TBP	DSSF	PUREX	REDOX	~~FeCN~~	Flam	Org
1	U-103	100[1]	Flammable gas generation/retention; Organic solubility; Organic aging; moisture retention/distribution.[1]	Examine the properties of flammable gas waste type 1A; Organic fuel distribution.[1]		X	X					X	X
2	BY-105	100	Organic solubility; Organic aging; Ferrocyanide aging; Moisture retention/ distribution.	Organic fuel distribution; Ferrocyanide fuel distribution; Examine bounding saltcake forms; Examine bounding sludge forms; Determine spatial variability in complex tank;		X	X				~~X~~		
3	U-105	93	Organic solubility; Organic aging; Moisture retention/ distribution.	Organic fuel distribution; Spatially complex; Determine if metal waste type exists.	X	X						X	X
4	U-109	91	Organic solubility; Organic aging; Moisture retention/ distribution.	Organic fuel distribution; Determine spatial variability in simple tank; Range of variability in different saltcakes.		X						X	
5	BY-103	86	Organic solubility; Organic aging; Ferrocyanide aging; Minimum fuel concentration required to support propagation; Moisture retention/ distribution.	Organic fuel distribution; Ferrocyanide fuel distribution; Spatial variability in complex tank; Examine bounding saltcake forms; Examine bounding sludge forms.		X	X				~~X~~		
6	U-108	84	Organic solubility; Organic aging; Moisture retention/ distribution.	Organic fuel distribution; Spatially complex; Determine if metal waste type exists.		X				X		X	
7	U-107	76	Organic solubility; Organic aging; Moisture retention/ distribution.	Organic fuel distribution.	X	X						X	X

Table F-1: Tank Waste Characterization Basis High Priority Tanks

	TANK PRIORITIZATION LIST		ISSUES		WASTE TYPE						WATCH LIST		
	Tank	Relative Value	PHENOMENON RELATED	COMPOSITION RELATED	$BiPO_4$	EB	TBP	DSSF	PUREX	REDOX	FeCN	Flam	Org
8	BY-106	74	Organic solubility; Organic aging; ferrocyanide aging; Moisture retention/ distribution.	Organic fuel distribution; Ferrocyanide fuel distribution.		X	X				X		
9	S-102	74		Range of variability in different saltcakes; Spatial variability in simple tank.		X						X	X
10	SX-103	67		Confirm composition of REDOX sludge; Spatial variability in tank containing saltcake and sludge.		X				X		X	X
11	BY-108	65 C	Organic aging; Ferrocyanide aging; Organic solubility; Moisture retention/ distribution.	Organic fuel distribution; Ferrocyanide fuel distribution; vapor detection of organic solvent.		X	X				X		
12	A-101	62		Model of major saltcake composition; Spatial variability in simple tank.		X						X	X
13	TX-118	61		Resolve historical conflicts on saltcake, ferrocyanide, and organic waste.		X					X		X
14	SX-104	61		Confirm composition of REDOX sludge, spatial variability in tank containing saltcake and sludge.		X				X		X	
15	BY-110	52 C	Ferrocyanide aging; Moisture retention/ distribution.	Spatial variability in complex tank; Corroborate vapor detection of organic solvent; Examine bounding saltcake forms; Examine bounding sludge forms.		X	X				X		
16	TX-111	51		Confirm T2 saltcake waste composition.		X							
17	BY-104	51	Ferrocyanide aging; Minimum fuel concentration required to support propagating reaction; Moisture retention/ distribution.	Spatial variability in complex tank; Examine bounding saltcake forms; Examine bounding sludge forms.		X	X				X		
18	C-104	50		Greatest vertical and horizontal variability. Contains minimum of eight waste types.					X				

Table F-1: Tank Waste Characterization Basis High Priority Tanks

TANK PRIORITIZATION LIST			ISSUES		WASTE TYPE						WATCH LIST		
	Tank	Relative Value	PHENOMENON RELATED	COMPOSITION RELATED	$BiPO_4$	EB	TBP	DSSF	PUREX	REDOX	~~FeCN~~	Flam	Org
19	S-107	50 C		Confirm REDOX waste composition; Spatially complex tank.		X				X			
20	S-101	50		Confirm saltcake waste composition; Confirm REDOX waste composition; Spatially complex tank.		X				X			
21	SX-101	49	Sample material for pretreatment/ disposal studies.	Confirm saltcake waste composition; Confirm REDOX waste composition; Spatially complex tank.		X				X		X	
22	S-110	47		Confirm composition of REDOX sludge; Determine spatial variability in tank containing saltcake and sludge.		X				X			
23	AW-101	47	Flammable gas generation/ retention. Sample material for pretreatment/ disposal studies.					X				X	
24	AN-104	46	Flammable gas generation/ retention. Sample material for pretreatment/ disposal studies.					X				X	
25	AX-101	43		Confirm model of major saltcake composition; Spatial variability in simple tank.		X						X	
26	AN-105	37	Flammable gas generation/ retention. Sample material for pretreatment/ disposal studies.					X				X	
27	AN-103	36	Flammable gas generation/retention.					X				X	
28	B-104	15 C		Multiple waste types to be confirmed; Unknown waste type inputs; Spatially complex tank.	X	X							

[1] These entries are from Revision 3 of the Characterization Technical Sampling Basis (formerly Tank Waste Characterization Basis) document (Brown et al. 1997).

APPENDIX G

HIGH PRIORITY TANKS SCHEDULE

The schedule is under review, and will be provided in a future change.

APPENDIX I

FUTURE PACE OF SAMPLING PROGRAM

1 CORE SAMPLING

Core sampling to satisfy the intent of Recommendation 93-5 occurs in three phases. The three phases are conceptual in nature rather than strictly chronological.

- Phase A: Includes tanks core sampled from January 1994 through July 31, 1996. This phase does not include High Priority Tanks.
- Phase B: Core sampling of the High Priority Tanks.
- Phase C: Core sampling of the remaining tanks after completion of the High Priority Tanks. This phase includes sampling of alternate tanks after July 31, 1996.

It has occasionally been necessary to sample tanks other than High Priority Tanks. The need to sample alternate tanks has been driven by delays in deploying the retained gas sampler, imposition of flammability controls on all tanks, and the need to qualify the Rotary Mode Core Sampling Systems for operation in flammable gas atmospheres. Figure I-1 provides a summary chart that outlines tank core sampling plans from 1994 to 1997. Off Ramp tanks is a term for alternate tanks that could be sampled to meet characterization needs as defined in the *Tank Waste Characterization Basis* (Brown et al. 1995) if the High Priority Tanks cannot be sampled (Eberlein 1996).

Five sampling crews have been hired and trained. Because of the priority placed on completing the core samples from the High Priority Tanks, four of the sampling crews are devoted to obtaining core samples. Three of these four core sampling crews are used to sample on three shifts per day, five days a week, on one of the four trucks. The fourth core sampling crew is used to move and set-up the truck which has just completed a core. The fifth sampling crew is used to collect vapor, auger, and liquid grab samples.

Accelerating completion of the HPT sampling by increasing the number of sampling crews was considered. The April 1996 schedule completes the HPT sampling in May 1997. Approximately six months would be required to hire and train additional crews. During the training phase, the field sampling rate would decrease due to diverting one sampling truck to complete operator training. The associated impact would delay the HPT sampling schedule by one to two months. By the end of November, the new crews would be ready for field deployment. Assuming that four additional sampling crews were deployed, the sampling rate could be doubled. This would allow completion of the HPT sampling in March rather than May.

Figure I-1: Core Sampling Sequence 1994-1997

The core sampling schedule is under review. This figure will be provided in a future change.