Document title: # ICD 23 - Interface Control Document for Waste Treatability Samples

Document number: 24590-WTP-ICD-MG-01-023, Rev 4

Contract: DE-AC27-01RV14136 **Contract deliverable:** C.9.1

Department: Project Management

NOTE: **All WTP Interface Partner concurrence signatures found on the following page shall be obtained prior to approval of this ICD.**

Approved by: Tom Lane _____

Print Name **Signature**

ICD 23 Team Lead and Principal Author

Issue Status: Approved

Date Issued: 11/26/12

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NOTE: **This document defines current service needs, future needs, and service gaps. The identified service levels do not represent contractual obligations between service recipient and providers. Future contractual and funding actions to close service gaps will be accomplished by integration between the federal offices as part of the budget planning process.**

WTP Interface Partner Concurrence

Interface Owners (IOs) including DOE-ORP and DOE-RL when appropriate, will sign ICD concurrence sheets indicating their concurrence with the ICD contents. These concurrence signatures signify that the ICD accurately reflects current contract baselines, except as indicated in Appendix C, Open ICD Issues and Actions. This ICD shall not be approved until all concurrence signatures on this page have been obtained.

Organization	Position	Name	Signature	Date
WTP	ICD 23 Interface Owner	Bill Clements OR Sal Beltran		11/12/12
TOC	ICD 23 Interface Owner	Stuart Arm		10/25/12
DOE-ORP WTP	ICD 23 Interface Owner	Wahed Abdul		11/19/12

NOTE: This document defines current service needs, future needs, and service gaps. The identified service levels do not represent contractual obligations between service recipient and providers. Future contractual and funding actions to close service gaps will be accomplished by integration between the federal offices as part of the budget planning process.

History Sheet

Rev	Date	Reason for revision	Revised by
A	16 Jul 2001	Issued for ORP Concurrence	P Brackenbury
0	14 Mar 2002	Provided for ORP Contracting Officer to Issue as Operative ICDs. Upon issuance, this document will supercede BNFL-5193-ID-23, Revision 5.	P Brackenbury
1	15 Aug 2002	Semi-annual update.	P Brackenbury
2	15 Feb 2003	Semi-annual update.	P Brackenbury
3	15 Aug 2003	Annual update. Incorporated approved ICFs 24590-WTP-ICF-RT-03-001 & 03-002.	P Brackenbury
4		Periodic update. Reflects change to Regulatory DQO Implementation Schedule as a result of DQO optimization and Contract modification. Implements the following ICFs: o 24590-WTP-ICF-MG-01-003, Rev 1 o 24590-WTP-ICF-MG-01-004, Rev 0 o 24590-WTP-ICF-MG-02-002, Rev 0 o 24590-WTP-ICF-MG-02-004, Rev 0 o 24590-WTP-ICF-RT-03-003, Rev 0 o 24590-WTP-ICF-RT-03-004, Rev 0 o 24590-WTP-ICF-RT-03-005, Rev 0	T Lane

Revision Description

ICD Section	Description
Cover Sheet	Added Contract Deliverable Number in accordance with 24590-WTP-GPP-MGT-003, Rev 2, Interface Control Procedure, Appendix A, Interface Control Document Format.
Acc	Added Acronyms and Abbreviations page.
Sect 1.1	Modified first sentence to account for waste treatability samples that have already been taken.
Sect 1.1	Second paragraph, first sentence, removed the words, "and regulatory compliance analysis". This was done because "regulatory compliance analysis" was never a primary purpose of the waste treatability samples.
Sect 1.1	Added the following new third paragraph for clarity, "All currently identified testing has been completed and samples returned. There are no current open items identified in this ICD."
Sect 1.2	Deleted the following text referring to bolded words in Table 1, "The **bold** words represent items controlled by the U.S. Department of Energy, Office of River Protection (DOE ORP). Any modification to the **bold** words requires the specific approval of the DOE ORP contracting officer and shall be documented on an interface change form (ICF)" because the contracting officer no longer signs the document and interface change forms are no longer used. Also deleted the bold feature from all text in Table 1.
Sect 1.2 Table 1	In addition to surface contamination limits, added the following requirement for hedgehogs((sample containers)or similar containers, "AND a dose rate of less than 0.5 millirem per hour" based on the boundary limit between R2 and R3 area classification.
Sect 1.2 Table 1	Combined former Row 6 with Row 4. The reason for this is to emphasize that if any waste treatability sample is to be shipped off of the Hanford Site, a waste residue return plan must be in place prior to shipping the sample off of the Hanford Site. Also added a footnote referring to Settlement Agreement, WASHINGTON v. BODMAN, Civil No. 2;03-cv-05018-AAM, January 6, 2006.
Sect 1.2 Table 1	Deleted Row 9 because table 3 is complete and glass residues are addressed in item 8.
Sect 1.2 Table 2 Table 3 Table 4	Due to the transition of all ICD Action Items and Issues to the Action Tracking System (ATS), deleted Table 2, Issues. The deletion of Table 2 caused the former Table 3 to be renumbered as Table 2 and former Table 4 to be renumbered as Table 3. Also deleted the Note in Section 1.2.
Table 3 (new Table 2), first three regulatory samples	Entered, "Completed" in the date columns to reflect the fact that these sample transfers have been completed.
Table 3 (new Table 2)	Deleted, "started in FY04 and" from footnote 5, since that date is in the past.
Table 3 (new Table 2), Footnote 9	Moved Table 3 (2), Footnote 9 to Note at the front of the table. Incorporated change in accordance with ICF 24590-WTP-ICF-RT-03-005.
Table 3 (new Table 2)	Added high TOC sample material samples to support the pulse jet mixer program with targeted gas generation rate and transport studies in accordance with ICFs 24590-WTP-ICF-RT-03-003 and 24590-WTP-ICF-RT-03-004.

Revision Description

ICD Section	Description
Sect 1.4	Deleted the following paragraph, since it no longer applies: "The samples described in sections 1.5 and 1.6 below need not comply with Specification 7, Low Activity Waste Envelopes Definition, nor with Specification 8, High Level Waste Envelopes Definition, of the BNI contract (BNI 2000). These samples will be ready for pick up no later than the late shipment date or 10 calendar days after receipt of the empty shipping container returned from the initiating contractor, whichever is later."
Sect 1.5.1.6	Replaced former data with the following: "This sample is no longer required. As of September, 2012, C-104 has not yet been transferred to AY-101. The requirement to characterize the waste in these tanks will be fulfilled by sampling the staging tank prior to waste transfer to WTP." Also moved the information regarding table 2 to Section 1.5.2.
Sect 1.7 App B	Added new section 1.7 and Appendix B to address HLW Samples for M12 (Undemonstrated Leaching Process) Testing.
Sect 2	Deleted the following reference because the only instance in the document that formerly called it out was deleted (former Table 2): • WSRC. 2000b Added the following references to support changes made to address HLW Samples for M12 (Undemonstrated Leaching Process) Testing: • BNI. 2007b. CCN 147155 • BNI. 2007c. CCN 152322 • BNI. 2007d. CCN 147157 Added: • BNI. 2004. 24590-WTP-RPT-MGT-04-001, Rev 0, *Regulatory Data Quality Objectives Optimization Report*, dated February 5, 2004. Bechtel National, Inc., Richland, WA, USA. • BNI. 2003. CCN 056294. *Distribution of the Requirements Implementation Assessment Team Final Report*, dated June 16, 2003. Bechtel National, Inc., Richland, WA, USA. Updated remaining References.
App C	Added Appendix C, Open ICD 23 Issues and Actions.
App D	Added Appendix D, ICD 23 Issues and Actions Closed Since Last Revision.
App E	Added Appendix E, ICD 23 Open Items List.
All	Reformatted entire document in accordance with 24590-WTP-GPP-MGT-003, Rev 6, Interface Control Procedure. Rev bars were not used for formatting changes, however they were used for all changes recorded above.

Contents

Appendices

Tables

Acronyms and Abbreviations

BNFL	British Nuclear Fuels Limited
BNI	Bechtel National, Incorporated
Bq/m^2	becquerels per square meter
CFR	*Code of Federal Regulations*
CH2	CH2M HILL Hanford Group, Inc.
°F	degrees Fahrenheit
DOE	U.S. Department of Energy
DOE-ORP	U.S. Department of Energy, Office of River Protection
DOE-RL	U.S. Department of Energy, Richland Office
DQO	data quality objectives
HLW	high-level waste
HSSWAC	Hanford Site Solid Waste Acceptance Criteria
ICD	Interface Control Document
ILAW	immobilized low-activity waste
LAW	Low-Activity Waste
min	minimum
QARD	Quality Assurance Requirements and Description
RPP	River Protection Project
TBD	to be determined
TFC	Tank Farm Contractor
TL	Technical Lead
TOC	Tank Operations Contractor
WTP	Hanford Tank Waste Treatment and Immobilization Plant
WSRC	Westinghouse Savannah River Company

1 Interface Description

1.1 Interface Definition

The River Protection Project – Waste Treatment Plant (WTP) Contractor has conducted, and will continue to conduct on an as needed basis, waste treatability studies to support completion of facility design, operations, and waste form compliance demonstrations. The waste treatability studies will also develop information to verify that final, intermediate, and secondary waste products generated during waste treatability testing meet the requirements for disposal established in the *Hanford Site Solid Waste Acceptance Criteria (HSSWAC)*, HNF-EP-0063 (CHPRC 2011).

The Washington Administrative Code (WAC) 173-303-040 defines the following term:

"Treatability study" means a study in which a dangerous waste is subjected to a treatment process to determine: Whether the waste is amenable to the treatment process; what pretreatment (if any) is required; the optimal process conditions needed to achieve the desired treatment; the efficiency of a treatment process for a specific waste or wastes; or the characteristics and volumes of residuals from a particular treatment process. Also included in this definition for the purpose of the exemptions contained in WAC 173-303-071 (3)(r) and (s), are liner compatibility, corrosion, and other material compatibility studies and toxicological and health effects studies. A "treatability study" is not a means to commercially treat or dispose of dangerous waste.

The waste treatability samples of candidate low-activity waste (LAW) and high-level waste (HLW) feed materials will be used for process testing and waste form qualification. These samples will be collected from Hanford source tanks and be made available by the US Department of Energy (DOE) or other Hanford Site contractors to sub-contractors qualified by their radiation protection programs for sample packaging, shipping, receipt, and analysis.

All currently identified testing has been completed and samples returned. There are no current open items identified in this ICD.

1.2 Functional Requirements

The WTP Radiation Protection Program, implemented prior to the start of construction, covers design and construction activities only. Retrieval, shipping, and handling of radioactive waste treatability samples and returned residues will be performed on behalf of the WTP Contractor by contractors authorized to perform these activities under their own radiation protection programs, established in response to 10 CFR 835.

Table 1 (on the following page) presents the top-level interface requirements for each organization with responsibility for a part of this interface. Column 1 presents WTP responsibilities identified in the WTP baseline. Column 2 presents Tank Operations Contractor (TOC) interface responsibilities identified in the TOC baseline. Column 3 presents interface actions for DOE or other Hanford Site contractors necessary to support this interface.

1.3 Physical Interfaces

The DOE, or its other qualified site contractors, will package the waste treatability samples for turnover, on behalf of the WTP Contractor, to sub-contractors authorized for their receipt.

- At departure, the physical interface for transfer of custody of the waste treatability study samples to the contractor authorized for their receipt (on behalf of the WTP) is the DOE shipping facility at the Hanford Site.
- At receipt, the physical interface for transfer of custody of this material from the contractor authorized for their transportation (on behalf of the WTP) to the DOE or its other qualified contractor is the DOE receipt facility at the Hanford Site.

The physical interface for transfer of custody of the treatability study residues and immobilized LAW and HLW glass samples is the receiving facility designated by the DOE. Contractors authorized by their own radiation protection programs shall package and transport the treatability study residues and LAW and HLW glass samples.

The WTP Contractor shall pay the transportation costs for shipping the original sample materials, and for returning any original sample materials, the waste treatability study residues, and immobilized LAW and HLW samples (glasses) to the Hanford Site.

1.4 Administrative Interfaces

Sampling, analysis, and testing requirements for test byproducts and vitrified material to support regulatory compliance and permitting are not covered by this ICD.

1.5 Schedule and Management Requirements for Waste Treatability Samples

1.5.1 Sample Schedule

Samples required during the design and construction phase are described in Table 2. The following schedule milestones have been established for purposes of interface per the *River Protection Project Integrated Schedule Specification* (DOE 2000a). Activity identification numbers (IDs) referenced are from the respective contractor's work schedules that support the approved baseline. Note: Early date represents the earliest planning date for the activity to begin and should be verified with the contractors' most current approved schedules. Late dates are shown to provide a scheduling window.

Table 1 - Interface Responsibilities for Waste Treatability Study Samples

The WTP Contractor Shall…	The Tank Operations Contractor Shall…	DOE Will…
1 Request tank waste treatability samples on an as-required basis.	1 Plan for and maintain a baseline that supports WTP tank waste treatability sample requests.	1 Evaluate WTP Contractor requests for waste treatability samples and support the Tank Operations Contractor sample program.
2 Negotiate a schedule and sample quantities for DOE to provide the waste treatability samples to the RPP-WTP Contractor (Table 2).	2 Negotiate a schedule and sample quantities for the RPP-WTP Contractor shipment of waste treatability samples.	2 Negotiate with Ecology the regulatory requirements for collection and handling of regulatory compliance samples.
3 Receive hedgehogs (sample containers) or equivalent containers with smearable surface contamination less than 367 Bq/m^2 alpha and less than 3,670 Bq/m^2 beta/gamma AND a dose rate of less than 0.5 millirem per hour.	3 Provide hedgehogs (sample containers), or equivalent containers, to the RPP-WTP Contractor for shipment per negotiated sample schedule.	3 No Action
4 Ship waste treatability samples from the Hanford Site to the RPP-WTP Contractor's test facility. If any waste treatability sample is to be shipped off the Hanford Site, prior to shipping, provide DOE a waste residue return plan that includes estimates of waste volume and composition, preliminary return schedule, and proposed waste minimization steps[1]. The information will be updated annually by June 30 until all waste has been returned to Hanford or has been suitably disposed of off site (section 1.6.1).	4 Package waste treatability samples for shipment in accordance with the agreed schedule and sample quantities. If any waste treatability sample is to be shipped off the Hanford Site, prior to shipping, identify disposition pathways for the various returns. Assist DOE-ORP in review of waste return plan.	4 If any waste treatability sample is to be shipped off the Hanford Site, prior to shipping perform the following: o Participate with Tank Operations Contractor in identifying disposition pathways for the various returns. o Review and approve the RPP-WTP Contractor's waste residue return plan, including disposition pathway. o Regarding waste residue returns, ensure that the requirements of all DOE agreements with Ecology are met.
5 Return empty sample carriers with smearable surface contamination less than 367 Bq/m^2 alpha and less than 3,670 Bq/m^2 beta/gamma or a dose rate of less than 0.5 millirem per hour. The empty sample carriers shall be returned within two weeks (or as negotiated) of receiving the samples.	5 Receive empty sample carriers.	5 No Action
6 Prepare draft waste profile information for the treatability study residues returned to the DOE. Summary must demonstrate compliance with the HSSWAC (section 1).	6 Approve waste profile information.	6 Assist in review and acceptance of the waste profile information.
7 Package and transport waste treatability study residues as a solid to the Hanford Site in accordance with the Hanford Site Solid Waste Acceptance Criteria, HNF-EP-0063 within 12 months of receipt of each sample or as negotiated with DOE. The Contractor may ship waste treatability study residues as liquid only with prior approval by DOE.	7 Receive and dispose of waste treatability study residues, including LAW and HLW glasses, that meet the Hanford Waste Acceptance Criteria, HNF-EP-0063, or other criteria as negotiated with the WTP Contractor. Coordinate disposal of waste treatability study residues with Plateau Remediation Contractor (PRC) or Hanford Site Contractors.	7 No Action

[1] **Refer to Settlement Agreement,** ***WASHINGTON v. BODMAN, Civil No. 2;03-cv-05018-AAM, January 6, 2006.***

1.5.1.1 Milestone 23A - Initiate Shipment of Regulatory DQO Sample AN-102:

This milestone represents the planned date for transfer of the AN-102 sample from the TFC for regulatory analyses. For the TFC, it represents that the sample has been collected and packaged, and is ready for shipment. For the WTP contractor, it represents the planned date for shipment to the appropriate analysis laboratory.

Contractor	Activity ID	Title	Early Date	Late Date
WTP	2BPR1PDM02	Initiate shipment of AN-102 sample	Complete	Complete
TFC	CR10P10G53	AN-102 sample available for shipment	Complete	Complete

1.5.1.2 Milestone 23B - Initiate Shipment of Regulatory DQO Sample AY 102/C-106:

This milestone represents the planned date for transfer of the AY-102 sample from the TFC for regulatory analyses. For the TFC, it represents that the sample has been collected and packaged, and is ready for shipment. For the WTP contractor, it represents the planned date for shipment to the appropriate analysis laboratory.

Contractor	Activity ID	Title	Early Date	Late Date
WTP	2BPR1PDM03	Initiate shipment of AY-102 / C-106 sample	Complete	Complete
TFC	CR10Z10C6	AY 102 / C-106 sample available for shipment	Complete	Complete

1.5.1.3 Milestone 23C - Initiate Shipment of Regulatory DQO Sample AZ-102:

This milestone represents the planned date for transfer of the AZ-102 sample from the TFC for regulatory analyses. For the TFC, it represents that the sample has been collected and packaged, and is ready for shipment. For the WTP contractor, it represents the planned date for shipment to the appropriate analysis laboratory. Completion of this milestone is not required because Step 2 of Regulatory DQO implementation was changed to align with acceptance of staged feed per WTP contract modification as a result of DQO optimization.

Contractor	Activity ID	Title	Early Date	Late Date
WTP	2BPR1PDM04	Initiate shipment of AZ-102 sample	Not Required	Not Required
TFC	CR10Z91C6	AZ-102 sample available for shipment	Not Required	Not Required

1.5.1.4 Milestone 23D - Initiate Shipment of Waste Treatability Sample AN-107:

This milestone represents the planned date for transfer of the AN-107 sample from the TFC for process verification and waste treatability testing. For the TFC, it represents that the sample has been collected and packaged, and is ready for shipment. For the WTP contractor, it represents the planned date for shipment to the appropriate analysis laboratory.

Contractor	Activity ID	Title	Early Date	Late Date
WTP	2BPR1PDM05	Initiate shipment of AN-107 sample	Complete	Complete
TFC	CT10N09G25	AN-107 sample available for shipment	Complete	Complete

1.5.1.5 Milestone 23E - Initiate Shipment of Waste Treatability Sample AN-104:

This milestone represents the planned date for transfer of the AN-104 sample from the TFC for process verification and waste treatability testing. For the TFC, it represents that the sample has been collected and packaged, and is ready for shipment. For the WTP contractor, it represents the planned date for shipment to the appropriate analysis laboratory.

Contractor	Activity ID	Title	Early Date	Late Date
BNI	2BPR1PDM06	Initiate shipment of AN-104 sample	Complete	Complete
TFC	CR10N05CPS	AN-104 sample available for shipment	Complete	Complete

1.5.1.6 Milestone 23F - Initiate Shipment of Waste Treatability Sample AY-101/C-104:

This sample is no longer required.

As of September, 2012, C-104 has not yet been transferred to AY-101. The requirement to characterize the waste in these tanks will be fulfilled by sampling the staging tank prior to waste transfer to WTP.

1.5.2 Sample Management

Table 2 provides a list of treatability samples required by the WTP for:

- Completing step 1 of the regulatory data quality objectives (DQO)
- Process verification and waste form qualification testing during the design, construction, and commissioning phases

A sample management document package shall be prepared and provided for each process verification/waste form qualification testing sample indicated below.

AN-104 (Pkg. Complete)	AP-101 (Pkg. Complete)
AN-107 (Pkg. Complete)	AY-101 / C-104 (Future)

To the degree possible, the sample management document package shall include:

- Laboratory history
- Recent historical waste transfer summary for the sampled tank
- Historical sampling and analysis results
- Sample location selection
- Sampling information
- Chain of custody forms for the sampling event

Samples awaiting shipment or repackaging for shipment should be protected using minimum measures to preserve the integrity of the material. The following minimum sample storage requirements apply to waste treatability samples to be collected in the near term, and will be updated with each revision of this ICD.

Minimum Sample Storage Requirements

Tank	Sample Mode	Recommendation
SY-102	Core (Solids/Liquids)	Cover solids with supernate, track sample weight and liquid level in containers.
AY-101 / C-104	Core (Solids/Liquids)	Cover solids with supernate, track sample weight and liquid level in containers.

Appendix A identifies samples of candidate LAW and HLW feeds that have been provided to the WTP Contractor. The WTP Contractor may request additional samples of these candidate LAW and HLW feeds for further waste treatability studies prior to processing these wastes in the WTP facilities.

1.6 Collection and Storage Requirements for Waste Treatability Samples to be Used for Regulatory Compliance Analysis

Management of waste treatability samples collected for regulatory testing should conform as closely as possible to the requirements of EPA SW-846, with exceptions as permitted by applicable Washington administrative codes and federal regulations. Estimation of the necessary TOC and DOE resources for FY 03 and beyond should be based upon planning on how best to conform to the aforementioned requirements, codes, and regulations.

1.6.1 Waste Treatability Study Residue Return Plan

The WTP Contractor prepared and submitted to the DOE a draft waste treatability study residue return plan for Part B-1 of the privatization contract. The WTP Contractor also prepared a separate waste treatability study residue return plan for the design and construction phase (WSRC 2003). The waste treatability study residue return plan for the design and construction phase includes an estimate of waste volume and composition, preliminary return schedule, and proposed waste minimization steps. These are intended to ensure that the *Hanford Site Solid Waste Acceptance Criteria* (Fluor 2002), or other criteria negotiated with the DOE, will be met. The TOC will collaborate with other Hanford Site contractors in identifying the disposal pathway for residues, original sample materials, and LAW and HLW glass samples. The WTP Contractor shall prepare and submit to the DOE for approval a draft waste characterization summary for the waste treatability study residues 2 months before the scheduled DOE residue receipt date.

1.6.2 Immobilized LAW Glass Samples

The WTP Contractor shall provide immobilized low-activity waste (ILAW) glass samples prepared from waste treatability samples to PNNL for detailed analysis in support of the ILAW performance assessment (DOE 2000b). The samples, quantities, and target shipment dates are listed in Table 3. These are split samples of ILAW glasses that are to be provided in the design and construction phase from waste treatability studies conducted previously.

1.7 HLW Samples for M12 (Undemonstrated Leaching Process) Testing

In December, 2006, PNNL sent a summary (BNI 2007a) of the rationale for selection of specific Hanford tank wastes for demonstration of caustic and oxidative leaching and filtration studies and for use as a basis of simulant development. In February, 2007, the WTP Contractor requested ORP's concurrence for use of selected HLW waste samples that had been stored at the 222-S Laboratory in waste treatability studies needed to support the testing of the pretreatment washing, leaching and ultrafiltration processes and to resolve the External Flowsheet Review Team M12 (undemonstrated leaching process) issue (BNI 2007b). This request was approved by DOE-ORP (BNI 2007c). In this document, DOE -ORP identified the following actions to be carried out by the WTP Contractor:

- Solicit comments from the Tank Farm Operations Contractor to assure critical data needs from these samples are identified.
- Incorporate lessons learned from Savannah River Treatability returns to ensure that regulatory requirements (including regulatory timelines) for all materials from the treatability tests are implemented including sample material , residue and waste disposal, through the life cycle of the treatability testing, and test equipment decommissioning, as necessary.
- Prepare required changes to the WTP Interface Control Document 23, Waste Treatability Samples [this document] to document use of these samples.

A letter (BNI 2007d) was sent to DOE-ORP informing them that the first two actions identified above were completed and of the intention to revise ICD 23 following receipt of all of the identified 222-S Laboratory waste samples. BNI was informed October 8, 2007 by PNNL that, "There are no further samples expected for delivery to PNNL under this test program."

Appendix B is a record of all data transmitted from PNNL to BNI regarding receipt of 222-S Laboratory samples in support of the M12 Undemonstrated Leaching Process Testing Program.

1.8 Acceptance Criteria

Tank waste sample collection, handling, and packaging for shipment will not be conducted under the Office of Civilian Radioactive Waste Management, Quality Assurance Requirements and Description (QARD) document. Also, see section 1.5.2, Sample Management.

1.9 Configuration Management Items

Data produced by treatability sample testing is not covered in this ICD. Administrative documentation related to interface management will be placed under configuration management and held in the WTP Project Document Control (PDC) files.

2 References

BNI. 2000. Contract No. DE-AC27-01RV14136, *Design, Construction, and Commissioning of the Hanford Tank Waste Treatment and Immobilization Plant*. Bechtel National, Inc., Richland, Washington.

BNI. 2003. CCN 056294. *Distribution of the Requirements Implementation Assessment Team Final Report*, dated June 16, 2003. Bechtel National, Inc., Richland, WA, USA.

BNI. 2004. 24590-WTP-RPT-MGT-04-001, Rev 0, *Regulatory Data Quality Objectives Optimization Report*, dated February 5, 2004. Bechtel National, Inc., Richland, WA, USA.

BNI. 2007a. CCN 150547. Selection of Specific Hanford Tank Wastes for Demonstration of Caustic and Oxidative Leaching and Filtration Studies, dated 18 December 2006. Bechtel National, Inc., Richland, WA, USA.

BNI. 2007b. CCN 147155. Contract No. DE-AC27-01RV14136 - Request for M12 Use of Selected High-Level Radioactive Waste Samples, Letter from WS Elkins, BNI WTP Project Director to RJ Schepens, Manager DOE-ORP, dated 01 February 2007. Bechtel National, Inc., Richland, WA, USA.

BNI. 2007c. CCN 152322. Contract No. DE-AC27-01RV14136 - Approval to Use High-Level Waste (HLW) Samples for M12 (Undemonstrated Leaching Process) Testing, Letter from JR Eschenberg, DOE-ORP to CM Albert, WTP Project Manager, BNI dated 06 February 2007. Bechtel National, Inc., Richland, WA, USA.

BNI. 2007d. CCN 147157. Contract No. DE-AC27-01RV14136 - Approval to Use High-Level Waste (HLW) Samples for M12 (Undemonstrated Leaching Process) Testing, Letter from WS Elkins, BNI WTP Project Director to SJ Olinger, Acting Manager, DOE - ORP dated 13 March 2007. Bechtel National, Inc., Richland, WA, USA.

10 CFR 835. 2007. *Occupational Radiation Protection*, Code of Federal Regulations.

SW-846 Update IIIB. 2005. *Test Methods for Evaluating Solid Waste, Physical/Chemical Methods*. US Environmental Protection Agency, Washington, DC.

Battelle. 2003. *Proposed Holding Time and Storage Condition Study Strategy*, WTP-RPT-040, Rev 0, Battelle Pacific Northwest Division, Richland, Washington.

CH2. 2005a. *Tank Farms Contractor Operation and Utilization Plan*, HNF-SD-WM-SP-012, Rev 5D. CH2M HILL Hanford Group, Inc., Richland, Washington.

CHPRC. 2011. *Hanford Site Solid Waste Acceptance Criteria,* HNF-EP-0063, Rev 16, February 2011. Fluor Hanford, Inc., Richland, Washington.

DOE. 2000a. *River Protection Project Integrated Schedule Specification*, Rev 1. US Department of Energy, Office of River Protection, Richland, Washington.

DOE. 2000b. Letter 00-SOD-065/00005763, dated 3 November 2000 from JJ Short, DOE, to MP DeLozier, CH2M HILL Hanford Group Inc., Contract No. DE-AC27-99RL14047 - Delivery of Glass Samples to Pacific Northwest National Laboratory (PNNL).

PNNL. 1998. *Regulatory Data Quality Objectives Supporting Tank Waste Remediation System Privatization Project,* PNNL-12040, Rev 0. Pacific Northwest National Laboratory, Richland, Washington.

WSRC. 2003. CCN 052003. Letter dated 21 January 2003 from H F Sturm, Westinghouse Savannah River Company to S Barnes, Bechtel National, Inc., "*SRTC RPP Project FY-03 Returns Forecast*".

Table 2 WTP Contractor Sample Request for Design and Construction Phase

Source Tank	Sample Type	Quantity of Solids[1] (grams)	Quantity of Liquid	Sample Ready for Shipment-Early	Sample Ready for Shipment-Late
Note: Sampling must be completed to implement Step 1 (PNNL 1998) and Step 2 (BNI 2004) of the regulatory data quality objectives. Step 1 samples taken to date, reported in Appendix A, are being used to establish analytical methods for regulatory analyses of tank waste matrices. Regulatory Implementation DQO samples (Step 2) will be collected when the waste is staged for delivery. These changes are the result of the RDQO Optimization process[12] (BNI 2004) and recommendations from the Requirements Implementation Assessment Team, RIAT-021 (BNI 2003).					
AP-101	Supernate samples to be obtained from five equally spaced depths within the tank liquid phase.	Solids that are present in sample	Min. 500 ml	Complete	Complete
AZ-101	A minimum of one core sample from each of two maximally spaced risers. Additional full-depth core samples should be provided as necessary to provide the requested sample quantities	Min. 350 g	Min. 500 ml	Complete	Complete
AZ-102	A minimum of one core sample from each of two maximally spaced risers. Additional full-depth core samples should be provided as necessary to provide the requested sample quantities	Min. 350 g	Min. 500 ml	Complete	Complete
AN-104[7]	One full-depth core sample.	Solids that are present in core sample	Min. 3.5 liters (See footnote 3)	Sample sequence should be based upon CH2 2005a. Also see footnote 5.	Sample sequence should be based upon CH2 2005a. Also see footnote 5.
AY-101 / C-104[8]	Samples are to be obtained after retrieval of C-104 sludge into tank AY-101. A minimum of one core sample from each of two maximally spaced risers. Additional full-depth core samples should be provided as necessary to provide the requested sample quantities.	----	----	Sample sequence should be based upon CH2 2005a. Also see footnotes 5 and 6.	Sample sequence should be based upon CH2 2005a. Also see footnotes 5 and 6.

Table 2 WTP Contractor Sample Request for Design and Construction Phase

Source Tank	Sample Type	Quantity of Solids[1] (grams)	Quantity of Liquid	Sample Ready for Shipment-Early	Sample Ready for Shipment-Late
AN-105	One full-depth core sample.	Solids that are present in core sample	Min. 3.5 liters (See footnote 3)	Sample sequence should be based upon CH2 2005a. Also see footnote 5.	Sample sequence should be based upon CH2 2005a. Also see footnote 5.
AP-104 / SY-101	Supernate samples to be obtained from five equally spaced depths within the tank liquid phase.	Solids that are present in sample	Min. 3.5 liters	Sample sequence should be based upon CH2 2005a. Also see footnote 5 and footnote 1 of Appendix A.	Sample sequence should be based upon CH2 2005a. Also see footnote 5 and footnote 1 of Appendix A.
AN-103	One full-depth core sample.	Solids that are present in core sample	Min. 3.5 liters (See footnote 3)	Sample sequence should be based upon CH2 2005a. Also see footnote 5.	Sample sequence should be based upon CH2 2005a. Also see footnote 5.
SY-102	A minimum of one core sample from each of two maximally spaced risers. Additional full-depth core samples should be provided as necessary to provide the requested sample quantities.	Min. 1050	Liquid present with sludge in the core samples	Sample sequence should be based upon CH2 2005a. Also see footnote 5.	Sample sequence should be based upon CH2 2005a. Also see footnote 5.
Samples to be used for Process Verification and Waste Form Qualification Testing					
SX-101	Archive Sample as shown. [10]	Jar/Vial # 13998	----	June 2003	July 2003
SY-102	Core sample or archive sample that is a representative composite sample of the waste in this tank. [10]	All of Core 284 consisting of Jar/Vial #: 18416, 18528, 18586, 19411, 19464 All of Core 286 consisting of Jar/Vial #: 18430, 18530, 18599, 18714, 18735, 18982 Jar/Vial #: 19357	----	June 2003	July 2003

Table 2 WTP Contractor Sample Request for Design and Construction Phase

Source Tank	Sample Type	Quantity of Solids[1] (grams)	Quantity of Liquid	Sample Ready for Shipment-Early	Sample Ready for Shipment-Late
AY-101 / C-104[8]	Samples are to be obtained after retrieval of C-104 sludge into tank AY-101. Core sample or archive sample that is a representative composite sample of the waste in this tank.	Min. 500	Min. 3.5 liters	2007 (See footnote 6)	2008 (See footnote 6)
AW-101	Samples support the pulse jet mixer program.	----	600 grams[11]		
AN-106		----	260 grams[11]		
AN-107		----	600 grams[11]		
C-104		550[11]	----		
U-106		----	220 grams[11]		
BX-103		110[11]	70 grams[11]		

1 Mass of solids is based on an equivalent centrifuged solids basis. Example: WTP Contractor has requested a minimum of 500 grams of solids on an equivalent centrifuged solids basis from tank AY-102. A sub-sample of waste from this tank has previously been analyzed to determine the settled solids and centrifuged solids densities are 1.25 gm/ml and 1.5 gm/ml, respectively. DOE (or its contractor) could provide to the WTP Contractor a minimum of 625 grams of settled solids which is equivalent to 500 grams of centrifuged solids ([500 gm]*[1.5gm/ml]/[1.2gm/ml]).

2 Deleted

3 A single core is assumed to be a minimum of 3.5 liters of sample material. The material would consist of liquid and crystallized/precipitated waste that upon dilution with demineralized water to 5M soluble sodium concentration would comprise a minimum of 5 liters.

4 Deleted

5 Sampling will be completed prior to the end of the WTP contract performance period. Currently, the tanks are shown arranged in the order they will be sampled (or feed delivery order).

6 Tank AY-101 is to be sampled after transfer of the contents of C-104 into AY-101.

7 Activity must be added to the current TOC baseline schedule.

8 Activity is in current baseline schedule, but needs to be rescored from two core samples to three core samples (two for regulatory and one for process verification).

9 Deleted

10 Precise quantities and sample vial identification to be negotiated between sample owner and lab recipient.

11 Requested quantities are approximate. Precise quantities and sample vial identification to be finalized at shipment.

12 WTP requirements for regulatory samples will be incorporated into this ICD and/or Tank Sampling and Analysis Plans (TSAPs) on an as needed basis. Requirements for coordination and scheduling of field sampling and the selection of tank sampling procedures will be identified in this ICD. The analytical laboratory is to provide the information in the TSAPs related to the analytical work performed according to the guidelines established in BNI 2004.

Table 3 ILAW Glass Samples that the WTP Contractor is to Provide to Battelle

Source Tank	Target Shipment Date	Mass of Sample
241-AN-102 (Env. C)	31 January 2001 (Complete)	1,000 ± 50 grams
241-AN-103 (Env. A)	31 January 2001 (Complete)	The maximum amount of glass remaining after tests, not to exceed 500 grams
241-AZ-102 (Env. B)	31 December 2003 (Complete)	The maximum amount of glass remaining after tests, not to exceed 500 grams

Note: Requirement for future glass samples may be made by Battelle through DOE-ORP or its representative.

Appendix A

Completed WTP Contractor Sample Requests

Appendix A
Completed WTP Contractor Sample Requests

Source Tank	Sample Type	Quantity	Units	Sample Ready for Shipment-Early	Sample Ready for Shipment-Late
AN-102	Supernate and incidental solids.	15 to 20	L	22 Sep 1998	6 Oct 1998
AN-103	Supernate and incidental solids (archive).	1.25 to 1.5	L	11 Sep 1998	25 Sep 1998
AN-104	Sample delivery deferred in lieu of providing AP-101 sample.				
AN-107	Supernate and incidental solids; one grab sample of supernatant and entrained solids at each of five different levels within the tank (total of five samples).	1.5 to 2	L	31 Aug 1998	14 Sep 1998
AW-101	Supernate and incidental solids. One grab sample of supernatant and entrained solids at each of five different levels within the tank (total of five samples).	1.5 to 2.0	L	31 Aug 1998	14 Sep 1998
AZ-102	Composite Solids Liquids	 150 to 200 3 to 4	 g L	9 Feb 1999	 23 Feb 1999
C-106	Composite. Solids and residual liquids (archive).	250 to 500	g	31 Aug 1998	14 Sep 1998
C-104 or an additional C-106	Composite. Solids and residual liquids (maybe partially provided from archive).	2000 to 5000	g	25 Feb 1999	11 Mar 1999
AP-101	One 125-ml sample from five different elevations within tank 241-AP-101 to represent the projected different layers of waste (total of five samples).	0.625	L	7 Feb 2000	25 Feb 2000
AW-101**	Supernate samples to be obtained from five equally spaced depths within the tank liquid phase. Samples may consist of archived material and a combination of new samples. Solids may be included that are present in the sample.	Min. 15.0	L	June 2000	July 2000
AP-101	The 0.625 L is to consist of supernate samples to be obtained from five equally spaced depths within the tank liquid phase. The AP-101 composite material also was obtained from five equally spaced depths within the tank liquid phase. The composite material has been diluted for retrieval program testing. Samples may consist of archived material and a combination of new samples. Solids may be included that are present in the sample.	0.625 (and the AP-101 composite materials remaining after retrieval testing)	L	November 2000	January 2001
AY-102/ C-106**	Core sample. Can be archive sample that is a representative composite sample of the waste in this tank.	990 (actual) 4.14 (actual)	g L	June 2001	July 2001
AZ-101	Core sample. Can be archive sample that is a representative composite sample of the waste in this tank.	Min. 250	L	July 2001	August 2001

Source Tank	Sample Type	Quantity	Units	Sample Ready for Shipment-Early	Sample Ready for Shipment-Late
AP-104 / SY-101	Supernate samples to be obtained from five equally spaced depths within the tank liquid phase. Samples may consist of archived material and a combination of new samples.	Solids that are present in sample	Min. 3.0	September 2001 (See footnote 1)	October 2001 (See footnote 1)
AZ-102	Archived supernate samples from archive storage in the 222S laboratory. The samples may be composited and shipped in 500 ml bottles.	Approx. 4	L	Needed in time to support work early CY 2002	October 2001
AN-107**	Supernate samples to be obtained from five equally spaced depths within the tank liquid phase. Samples may consist of archived material and a combination of new samples.	Min. 5	L	April 2002	May 2002
AN-104	Archive sample representative of the waste in this tank.	~400	g	June 2002	July 2002
AZ-101	Supernate sample representative of the waste in this tank.	~400	g	June 2002	July 2002
Completed Samples for Implementing Step 1 of the Regulatory DQO (PNNL 1998)					
AN-102*	Supernate samples to be obtained from 5 equally spaced depths with the tank liquid phase. Sludge sample to be obtained from beneath the sludge-liquid interface. This sample will be used for implementing step 1 of the regulatory DQO.	Min. 8 Min. 1000	L g	October 2000	November 2000
AY-102*	A minimum of one core sample from each of two maximally spaced risers. Additional full-depth core samples should be provided as necessary to provide the requested sample quantities. This sample will be used for implementing step 1 of the regulatory DQO.	Min. 1750 Liquid that is present in core samples	g L	November 2000	December 2000
AN-104[2]	Core sample or archive sample that is a representative composite sample of the waste in this tank.	Solids that are present in sample	Min. 3.5	August 2002	September 2002
AN-102	Grab sample from archive material for this tank.	250 Solids that are present in sample	ml	September 2002	October 2002

1 Tank AP-104 was sampled after receiving transfer from SY-101 (salt well liquor and other miscellaneous tank waste solutions).

* Sample for implementing Step 1 of PNNL 1998.

** Sample shipped off-site.

Appendix B

222-S Laboratory Samples in Support of M12 Undemonstrated Leaching Process Testing Program

Appendix B, Table 1
Group 1, Bismuth Phosphate Sludge

Sampling Date	Jar #	Tank	Core	Segment	2002 Gross	2007 Gross	2002 Net Weight (g)	2007 Net Weight (g)	% Mass Loss (2)
9/3/1997	13518	T-104	45	Comp	151.01	(1)	62.41	53.2	15%
6/7/1995	7197	B-104	88	1	80	(1)	54.8	50	8.8%
1/24/1996	8427	B-104	88	2	71.65	(1)	46.15	46.1	0.11%
1/24/1996	8428	B-104	88	2	75.38	(1)	49.48	50.3	-1.7%
6/7/1995	7190	B-104	88	2	87	(1)	62.1	61.8	0.48%
6/8/1995	7200	B-104	88	3	87.6	(1)	62.4	62.2	0.32%
1/21/1996	8421	B-104	88	3	89.74	(1)	64.04	63.9	0.22%
6/12/1995	7206	B-104	88	4	82.39	(1)	57.19	57.1	0.16%
6/12/1995	7205	B-104	88	4	83.52	(1)	58.67	58.3	0.63%
1/21/1995	8423	B-104	88	4	86.69	(1)	60.89	60.8	0.15%
6/12/1995	7207	B-104	88	5	82.82	(1)	56.98	56.9	0.14%
6/12/1995	7208	B-104	88	5	82.8	(1)	57.4	57.2	0.35%
1/21/1996	8425	B-104	88	5	85.76	(1)	60.16	60.1	0.10%

(1) The gross mass was not forwarded from the 222-S Laboratory to PNNL.

(2) Mass losses are assumed to be from water evaporation. Staff at 222-S are evaluating whether some of the larger sample mass discrepancies are attributable to additional sampling conducted between 2002 and 2007.

Appendix B, Table 1
Group 1, Bismuth Phosphate Sludge

Sampling Date	Jar #	Tank	Core	Segment	2002 Gross	2007 Gross	2002 Net Weight (g)	2007 Net Weight (g)	% Mass Loss (2)
7/10/1996	10113	B-104	88	5	189.56	(1)	101.66	100.7	0.94%
7/26/1995	7373	B-104	88	Comp	202.2	(1)	78	75.4	3.3%
9/15/1997	11843	B-104	89	1	292.4	(1)	172.1	143.1	17%
6/26/1995	7228	B-104	89	5	85.4	(1)	59.99	59.7	0.48%
6/26/1995	7227	B-104	89	5	86.3	(1)	60.92	60.2	1.2%
9/15/1997	13164	B-104	89	5	163.42	(1)	77.52	76.8	0.93%
12/7/1999	17523	B-104	89	5	176.4	(1)	94	87.1	7.3%
6/26/1995	7231	B-104	89	6	83.7	(1)	58.48	58.3	0.31%
6/26/1995	7229	B-104	89	6	85.1	(1)	59.77	59.5	0.45%
1/17/1996	8419	B-104	89	6	85.83	(1)	60.13	60.1	0.05%
1/17/1996	8418	B-104	89	6	87.81	(1)	62.11	62.1	0.02%
6/26/1995	7232	B-104	89	7	85.7	(1)	60.44	60	0.73%
6/26/1995	7233	B-104	89	7	86.2	(1)	60.68	60.2	0.79%
1/16/1996	9018	B-104	89	7	165.31	(1)	79.46	78	1.8%

(1) The gross mass was not forwarded from the 222-S Laboratory to PNNL.

(2) Mass losses are assumed to be from water evaporation. Staff at 222-S are evaluating whether some of the larger sample mass discrepancies are attributable to additional sampling conducted between 2002 and 2007.

Appendix B, Table 1
Group 1, Bismuth Phosphate Sludge

Sampling Date	Jar #	Tank	Core	Segment	2002 Gross	2007 Gross	2002 Net Weight (g)	2007 Net Weight (g)	% Mass Loss (2)
1/16/1996	9028	B-104	89	7	167.15	(1)	81.34	79.4	2.4%
9/26/1997	13442	B-104	89	Comp	166.47	(1)	81.82	78	4.7%
1/22/1996	9151	BX-112	118	1	151.78	(1)	60.28	55.8	7.4%
1/22/1996	9152	BX-112	118	1	157.72	(1)	66.52	20.9	69%
						Total Sample Net Weight (g)	**2,128**	**2,013**	**5.4%**

(1) The gross mass was not forwarded from the 222-S Laboratory to PNNL.

(2) Mass losses are assumed to be from water evaporation. Staff at 222-S are evaluating whether some of the larger sample mass discrepancies are attributable to additional sampling conducted between 2002 and 2007.

Appendix B, Table 2
Group 2, Bismuth Phosphate Saltcake

Sampling Date	Jar #	Tank #	Core #	Segment	2002 Net Weight (g)	Weight (g) Added to Composite	% Mass Loss (2)
6/17/1997	12694	BX-110	197	1	87.77	57.6	34%
6/17/1997	12744	BX-110	197	2	55.12	25.8	53%
2/6/2002 (1)	19298	BX-110	197	1	54.5	54.5	0%
7/1/1997	12647	BX-111	200	2	78.5	51.9	34%
7/1/1997	13021	BX-111	200	1	67.5	45.2	33%
7/1/1997	13022	BX-111	200	2A	92.77	90.5	2%
6/25/1997	13031	BX-111	202	1	59.1	37.3	37%
11/29/1995	8410	BY-104	116	2	20.2	18.4	9%
11/28/1995	8757	BY-104	116	3	29	28.1	3%
11/29/1995	8758	BY-104	116	3	69.9	68.5	2%
11/16/1995	8643	BY-105	108	2AR	79.87	77.7	3%
7/15/1996	10544	BY-107	151	4	51.5	45.5	12%
7/15/1996	10545	BY-107	151	4	109.3	95.4	13%
1/17/2001 (1)	18632	BY-107	151	4	38.7	31.6	18%

(1) Shaded sampling dates taken from the database.

(2) Approximately 9% of the mass losses are from sub-sampling events between 2002 and 2007. The remainder of the sample mass loss is assumed to be from water evaporation.

Appendix B, Table 2
Group 2, Bismuth Phosphate Saltcake

Sampling Date	Jar #	Tank #	Core #	Segment	2002 Net Weight (g)	Weight (g) Added to Composite	% Mass Loss (2)
8/8/1996	10848	BY-107	161	1	30.9	28.8	7%
9/18/1995	7679	BY-108	104	2	60.22	59.9	1%
9/18/1995	7686	BY-108	104	2	49.57	49.3	1%
9/18/1995	7687	BY-108	104	3	58.79	56.9	3%
9/18/1995	7689	BY-108	104	3	24.5	23.6	4%
9/19/1995	7690	BY-108	104	4	33	28.8	13%
9/19/1995	7691	BY-108	104	4	67.3	67.1	0%
9/19/1995	7692	BY-108	104	4	67.3	67.4	0%
9/9/1997	13525	BY-108	104	4	27.78	26.4	5%
2/8/1999	15570	BY-108	104	2	29.5	28.8	2%
4/12/1999	15622	BY-108	104	1	48.8	48.4	1%
8/17/1999	16950	BY-108	104	2	27.2	27.2	0%
7/1/1997	13039	BY-109	203	3	72.3	57.2	21%
7/1/1997	13040	BY-109	203	3	69.9	61.8	12%

(1) Shaded sampling dates taken from the database.

(2) Approximately 9% of the mass losses are from sub-sampling events between 2002 and 2007. The remainder of the sample mass loss is assumed to be from water evaporation.

Appendix B, Table 2
Group 2, Bismuth Phosphate Saltcake

Sampling Date	Jar #	Tank #	Core #	Segment	2002 Net Weight (g)	Weight (g) Added to Composite	% Mass Loss (2)
1/30/2002 (1)	19086	BY-109	203	3	95.9	95.4	1%
10/18/1995	8375	BY-110	96	1	49.89	49.2	1%
9/12/1997	13472	BY-110	103	1	33.5	33.1	1%
8/29/1995	7655	BY-110	106	1	39.5	39.2	1%
9/27/1995	7972	BY-110	109	1	41.47	38.2	8%
11/20/1996	11799	BY-112	174	1	29.3	28.236	4%
11/19/1996	11793	BY-112	177	1	20.3	18.2	10%
8/1/1995	7428	T-108	R5	Aug-35	27.32	19.3	29%
8/25/1995	7467	T-109	--	Aug-41	34.7	34.2	1%
3/2/1998	13856	TX-104	230	1	100.9	77.9	23%
2/27/1998	14021	TX-104	231	2A	26.75	25.9	3%
2/4/2002 (1)	19272	TX-113	253	5	23.3	5.1	78%
2/4/2002 (1)	18801	TX-113	258	5	143.5	142.4	1%
				Total Sample Net Weight (g)	**2227**	**1966**	**12%**

(1) Shaded sampling dates taken from the database.

(2) Approximately 9% of the mass losses are from sub-sampling events between 2002 and 2007. The remainder of the sample mass loss is assumed to be from water evaporation.

Appendix B, Table 3
Group 3, PUREX Cladding Waste

Sampling Date	Jar #	Tank #	Core #	Segment	2002 Net Weight (g) (2)
4/4/1996	9765	C-105	72	3	32
9/15/1996	11356	C-104	162	4	19.9
9/4/1996	11244	C-104	165	6	21.9
9/16/1996	11366	C-104	165	6	31.9
9/16/1996	11245	C-104	165	6	7
7/1/1997	13043	BY-109	203	7	55
7/1/1997	13044	BY-109	203	7	101.6
1/21/2002 (1)	19098	BY-109	203	7	121.2
2/4/2002 (1)	19134	BY-109	203	7	17.5
3/6/1995	6440	C-103	66	4	18.84
10/18/1996	11505	B-108	173	1	12.06
10/18/1996	11506	B-108	173	1	53.95
10/17/1996	11507	B-108	173	Comp	22.4
10/7/1996	11486	B-109	169	2	94.8

(1) Shaded sampling dates taken from the database.

(2) Masses shown are the net sample masses measured in 2002.

Appendix B, Table 4
Group 4, REDOX Cladding Waste

Sampling Date	Jar #	Tank #	Core #	Segment	2002 Net Weight (g) (2)
4/6/1995	6916	U-202	78	1	75.16
4/6/1995	6911	U-202	78	1	73.53
11/19/1998	15011	U-202	78	1	28.8
9/17/1997	13486	U-202	78	1	12.4
8/7/2002 (1)	19169	U-202	78	Comp	31.6
4/6/1995	6882	U-201	70	2	32.1
8/8/2002 (1)	19154	U-201	70	Comp	25.6
9/26/1997	13462	U-201	74	1	31.4
11/19/1998	15020	U-204	82	1	32.9
7/30/2002 (1)	19476	U-203	80	1	31.5
8/18/1999	16961	U-105	136	9A	120.9
4/5/1996	9711	U-105	136	9A	79.29
4/3/1996	9702	U-105	136	9A	11.97
9/8/1997	13072	U-204	81	1	65.09

(1) Shaded sampling dates taken from the database.

(2) Masses shown are the net sample masses measured in 2002.

Appendix B, Table 5
Group 5, REDOX Sludge

Sampling Date	Location	Box	Jar # Sample ID	Tank	Core	Segment	Matrix	2002 Measured Net Weight (g)	2007 Measured Net Weight (g)	% Mass Loss (1)
4/26/1996	11A1A	29	9880	S-101	142	8	Sludge	65.7	53	32
4/26/1996	11A1A	39	9879	S-101	142	8	Sludge	49	44.2	29
3/3/1999	11A2	9	15608	S-101	142	8	Sludge	21.5	9.3	58
4/25/1996	11A1A	39	9564	S-101	138	8	Sludge	72.28	66.3	34
4/25/1996	11A1A	39	9815	S-101	138	8	Sludge	68.09	62.4	27
5/5/1996	11A1A	29	9900	S-101	138	9	Sludge	63.4	51.7	44
5/5/1996	11A1A	29	9901	S-101	138	9	Sludge	61.4	57.2	30
8/13/1999	11A2	17	16914	S-101	138	9	Sludge	59.1	49.5	4
5/5/1996	11A1A	29	9899	S-101	138	7	Sludge	80.7	74	20
7/10/1996	11A1A	29	9898	S-101	138	7	Sludge	76.8	56.8	28
8/18/1999	11A2	20	16953	S-101	138	7	Sludge	88.2	64.7	27
11/17/2000	11A2	Floor	15899	S-101	138	7	Sludge	54.3	56.4	6
4/26/1996	11A1A	39	9877	S-101	142	7	Sludge	84.72	70.4	17
4/26/1996	11A1A	39	9878	S-101	142	7	Sludge	63	57.3	32

(1) Mass losses are assumed to be from water evaporation. Staff at 222-S are evaluating whether some of the larger sample mass discrepancies are attributable to additional sampling conducted between 2002 and 2007.

Appendix B, Table 5
Group 5, REDOX Sludge

Sampling Date	Location	Box	Jar # Sample ID	Tank	Core	Segment	Matrix	2002 Measured Net Weight (g)	2007 Measured Net Weight (g)	% Mass Loss (1)
8/13/1999	11A2	15	16921	S-101	142	7	Sludge	95.8	86.5	1
8/16/1999	11A2	17	16925	S-101	142	7	Sludge	80.6	62.2	30
4/19/1996	11A1A	28	9718	S-101	138	6	Sludge	80.3	62	34
4/19/1996	11A1A	28	9719	S-101	138	6	Sludge	97.1	90.9	12
8/12/1999	11A2	16	16905	S-101	138	6	Sludge	38.7	35.7	8
4/26/1996	11A1A	39	9875	S-101	142	6	Sludge	83.95	78	9
4/26/1996	11A1A	39	9876	S-101	142	6	Sludge	61.08	53.2	13
8/12/1999	11A2	14	16673	S-101	142	6	Sludge	43.2	35.2	23
8/13/1999	11A2	15	16908	S-101	142	6	Sludge	77.9	74.8	1
10/5/1995	**11A1A**	**46**	**7993**	**S-107**	**105**	**8**	**Sludge**	**7.39**	**broken bottle**	N/A
10/5/1995	11A1A	53	7995	S-107	105	8	Sludge	38.2	28.3	27
7/30/1997	11A2	5	13075	S-107	105	8	Sludge	79.3	65.2	22
10/9/1995	11A1A	50	8009	S-107	110	6	Sludge	60.8	59.3	7
10/9/1995	11A1A	50	8010	S-107	110	6	Sludge	76.2	74.6	2
9/29/1997	**11A1B**	**92**	**13450**	**S-107**	**110**	**6**	**Sludge**	**105.65**	**not found**	N/A

(1) Mass losses are assumed to be from water evaporation. Staff at 222-S are evaluating whether some of the larger sample mass discrepancies are attributable to additional sampling conducted between 2002 and 2007.

Appendix B, Table 5
Group 5, REDOX Sludge

Sampling Date	Location	Box	Jar # Sample ID	Tank	Core	Segment	Matrix	2002 Measured Net Weight (g)	2007 Measured Net Weight (g)	% Mass Loss (1)
6/23/1998	11A1B	164	14730 is 19884	S-110	241	7	Sludge	48.4	39.3	27
6/23/1998	11A2	Floor	14727	S-110	241	7	Sludge	38.7	39.8	21
7/27/1998	11A3	64	14558	S-110	241	7	Sludge	80.8	75.8	42
7/27/1998	11A3	75	14632	S-110	241	7	Sludge	129.1	117.5	9
7/27/1998	11A2	8	15000	S-110	241	8	Sludge	68.4	50.3	34
7/27/1998	11A3	64	14998	S-110	241	8	Sludge	32.2	30.6	58
7/30/1998	11A3	64	14972	S-110	240	9	Sludge	16.6	16.8	71
6/15/1998	11A1B	142	14601	S-110	240	10	Sludge	50.4	53.4	28
7/24/1998	**11A3**	**74**	**14999**	**S-110**	**240**	**10**	**Sludge**	**55.3**	**depleted**	N/A
7/27/1998	11A2	7	14639	S-110	240	10	Sludge	9.3	9.4	83
4/28/1998	11A3	71	14468	SX-103	235	11	Sludge	83.1	28.3	68
4/28/1998	11A3	60	14444	SX-103	235	12A	Sludge	19.2	17.8	30
5/5/1998	11A2	6	14479	SX-103	239	12	Sludge	73.2	26	68
							Total Sample Net Weight (g)	**2556**	**2084**	**~18%**

(1) Mass losses are assumed to be from water evaporation. Staff at 222-S are evaluating whether some of the larger sample mass discrepancies are attributable to additional sampling conducted between 2002 and 2007.

Appendix B, Table 6
Group 6, S-Saltcake

Date	Jar #	Tank	Core	Segment	2002 Gross	2007 Gross	2002 Net Weight (g)	2007 net Weight (g)	% Mass Loss (2)
7/19/1996	14255	S-111	237	5	310.9	113.5	95.2	(1)	(1)
4/2/1997	19292	U-103	182	1	95.9	95.6	13	12.7	2.31%
4/2/1997	19290	U-103	182	1	126.3	125.6	41.7	41	1.68%
8/17/1999	14653	SX-102	244	3	141.7	140	57.2	55.5	2.97%
7/17/1996	14044	SX-105	229	11	200	193	117	109.99	5.99%
8/12/1999	**14045**	**SX-105**	**229**	**11**	**190**	**depleted**	**106.41**	**0**	**100.00%**
12/2/1999	11855	SX-105	229	11	172.2	171.1	49.3	48.2	2.23%
10/30/1997	12895	SX-106	223	7	319.66	317.4	106.6	103.9	2.53%
10/30/1997	12907	SX-106	223	7	262.75	256.2	51.95	45.4	12.61%
6/11/1996	14644	SX-102	243	2	169	163.8	84.3	79.1	6.17%
3/11/1997	12110	S-106	183	8	152.33	119.5	64.33	31.5	51.03%
12/17/1997	13646	SX-106	224	9	180.9	180.9	95.1	95.1	0.00%
1/29/2002	19121	SX-106	224	9	116.7	116.7	33.5	33.5	0.00%
1/16/2002	19056	SX-106	224	6	109.8	108.3	26.3	24.9	5.32%

(1) This sample had been moved to jar # 20103. The tare for this jar is not known.

(2) Mass losses are assumed to be from water evaporation. Staff at 222-S are evaluating whether some of the larger sample mass discrepancies are attributable to additional sampling conducted between 2002 and 2007.

Appendix B, Table 6
Group 6, S-Saltcake

Date	Jar #	Tank	Core	Segment	2002 Gross	2007 Gross	2002 Net Weight (g)	2007 net Weight (g)	% Mass Loss (2)
1/16/2002	19093	SX-106	224	6	113	112.7	22.4	22.1	1.34%
5/8/1998	14232	S-111	237	9 (LH)	167.35	116.5	80.55	29.7	63.13%
5/8/1998	14441	S-111	238	9 (LH)	131.8	102.8	47.7	18.7	60.80%
10/31/1997	13504	SX-106	223	7	185.9	185	97.2	96.3	0.93%
10/21/1997	13505	SX-106	223	7	181.42	180.6	93.42	92.6	0.88%
11/20/2000	15959	SY-103	280	11	446	443.1	231.9	229	1.25%
12/17/1997	13642	SX-106	224	6	192.3	192	104	103.7	0.29%
12/17/1997	13643	SX-106	224	6	197.08	188.6	111.48	103	7.61%
5/27/1996	10203	U-108	145	9	145.1	144.1	56.9	55.9	1.76%
12/17/1997	13645	SX-106	224	8	135.48	134.4	49.68	48.6	2.17%
7/10/1997	13644	SX-106	224	8	187.1	186.9	100.3	100.1	0.20%
12/11/1997	12922	SX-106	224	8	321.06	316.8	111.96	107.7	3.80%
						Sample Net Weight (g)	**2,024**	**~1,688**	**~17%**

(2) Mass losses are assumed to be from water evaporation. Staff at 222-S are evaluating whether some of the larger sample mass discrepancies are attributable to additional sampling conducted between 2002 and 2007.

Appendix B, Table 7
Group 7, TBP Waste

Sampling Date	Jar #	Tank #	Core #	Segment	2002 Net Weight (g)	Current Weight (g)
4/20/1995	6907	BX-109	84	2	50.27	45.0
4/18/1995	6921	BX-109	85	1	54.6	54.5
4/18/1995	6922	BX-109	85	2	56.56	56.1
4/18/1995	6927	BX-109	85	2	50.45	41.0
4/19/1995	6930	BX-109	84	3	55.15	54.6
4/19/1995	6931	BX-109	84	3	52.55	33.6
4/20/1995	6932	BX-109	84	4	51.65	50.9
4/20/1995	6933	BX-109	84	4	52.08	51.1
4/20/1995	6934	BX-109	84	1	53.25	49.5
4/20/1995	6935	BX-109	84	2	49.03	48.6
4/21/1995	7153	BX-109	85	3	57.89	57.4
4/21/1995	7154	BX-109	85	3	54.97	54.9
4/21/1995	7157	BX-109	85	4	55.51	54.0
4/21/1995	7158	BX-109	85	4	53.19	51.5
7/26/1995	7372	BX-109	84	Comp	50.7	43.0
8/3/1995	7378	BX-109	84	Comp	132.7	75.7
7/24/1995	7417	B-106	93	2	50.49	49.8

Appendix B, Table 7
Group 7, TBP Waste

Sampling Date	Jar #	Tank #	Core #	Segment	2002 Net Weight (g)	Current Weight (g)
7/24/1995	7424	B-106	94	2	43.54	38.5
3/1/1996	9334	BX-109	85	3	81.74	45.9
3/1/1996	9346	BX-109	85	3	64.68	42.1
5/17/1996	10116	BX-109	85	2R2	69.5	64.7
9/11/1997	11840	BX-109	84	4	44.7	35.1
9/3/1997	13092	BX-109	84	3	72.5	61.2
9/26/1997	13445	BX-109	85	Comp	82.81	60.0
9/12/1997	13473	BX-109	85	1	48.75	45.0
9/3/1997	13515	BX-109	84	2	70.59	69.3
9/3/1997	13516	BX-109	85	1	25.02	23.4
9/3/1997	13517	BX-109	84	1	43.64	40.8
9/4/1997	13522	BX-109	85	4	48.93	28.9
9/4/1997	13523	BX-109	84	4	47.34	45.3
8/13/1999	16913	B-106	93	1-2	78.6	37.2
8/16/1999	16916	BX-109	85	2	66.1	60.9
2/6/2002 (1)	19302	BX-109	84	3	44	43.1

(1) Shaded sampling dates taken from the database.

Appendix B, Table 8
Group 8, FeCN Waste

Sampling Date	Jar #	Tank #	Core #	Segment	2002 Net Weight (g)	Current Weight (g)
2/7/1995	6403	BY-106	65	13	31.13	30.4
8/22/1995	7454	BY-108	99	4	26.9	23.6
8/22/1995	7455	BY-108	99	4	28.3	21.5
8/22/1995	7456	BY-108	99	4	37.2	37.1
8/22/1995	7457	BY-108	99	4	28.2	23.5
8/25/1995	7650	BY-110	103	9	46.47	40.0
9/19/1995	7695	BY-108	104	5	38.3	30.2
9/25/1995	7712	BY-110	107	9	27.37	23.4
9/25/1995	7713	BY-110	107	9	54.08	47.1
9/25/1995	7714	BY-110	107	9	54.28	54.2
9/25/1995	7715	BY-110	107	9	64.6	60.5
9/26/1995	7964	BY-110	101	9	68.67	67.5
9/26/1995	7967	BY-110	101	8	47.38	47.3
9/27/1995	7969	BY-110	101	9	58.54	50.2
9/27/1995	7970	BY-110	101	9	46.7	47.1
9/27/1995	7971	BY-110	101	9	67.1	65.5
10/26/1995	8485	BY-110	113	8	39.3	38.6

Appendix B, Table 8
Group 8, FeCN Waste

Sampling Date	Jar #	Tank #	Core #	Segment	2002 Net Weight (g)	Current Weight (g)
10/26/1995	8486	BY-110	113	8	56.4	55.6
10/26/1995	8487	BY-110	113	8	49.1	43.9
10/26/1995	8488	BY-110	113	8	22.4	21.5
11/10/1995	8782	BY-104	116	8	40.1	46.0
12/5/1995	8784	BY-104	116	8	82.9	95.9
12/16/1998	10767	BY-105	246	Comp	17.81	0.0
9/15/1997	13160	BY-108	104	5	69.11	63.5
9/9/1997	13529	BY-108	99	4	38.1	37.4
9/1/1998	14758	BY-105	246R	9R	130.72	117.9
10/2/1998	14987	BY-105	246R	9R	113.1	112.1
9/18/1998	14992	BY-105	250	9B	17.5	16.9
10/2/1998	15012	BY-105	246	9	73.3	58.5
1/25/2002 **(1)**	18770	BY-108	99	4	108.7	114.0

(1) Shaded sampling dates taken from the database.

Appendix C - Open ICD 23 Issues and Actions

Issue / Action #	Tracking #	Issue / Action	Baseline (In-Out-N/A)		Page(s)
			WTP	TOC	
No open ICD 23 Issues or Actions					

Appendix D - ICD 23 Issues and Actions Closed Since Last Revision

Issue / Action #	Tracking #	Issue / Action	Date Closed	Resolution
I23-9	24590-WTP-ATS-QAIS-07-998	RCRA Sampling Requirements	09/11/2007	24590-WTP-RPT-MGT-04-001, Rev 0, Regulatory Data Quality Objectives Optimization Report (BNI 2004) was issued February 20, 2004. Section 9, Sampling and Analysis Plan fully addresses treatability sample holding time and storage conditions.

Appendix E - ICD 23 Open Items List

NOTE: 24590-WTP-PL-MG-01-001, Interface Management Plan defines ICD Issues as one of two things; 1) Incompatibilities between contractor baselines and, 2) Incomplete interfaces. ICD Actions are defined as discreet activities engaged to resolve ICD Issues. There are items that do not fit the description of ICD Issues or ICD Actions found in the IMP that still require tracking. This does not mean these items are unimportant. The following list is a way of tracking these items to resolution. Depending on events related to these items, some of these items may be elevated to become ICD Issues or ICD Actions and others may be closed and removed from this list in future revisions to ICD 23. When an item on this list is closed, the resolution will be recorded in the Status column and it will appear in the next revision of ICD 23 with the resolution. In the revision after that, the item will be removed from the list, since it will have become part of the historical record.

Item #	Description	Source	Status