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2	1	Design Authority JW Bailey	[signature]		S2-48						
		Design Agent									
2	1	Cog.Eng. MC Davenport	[signature]		S2-48						
2	1	Cog. Mgr. JW Bailey	[signature]		S2-48						
		QA									
		Safety									
		Env.									

18.	19.	20.	21. DOE APPROVAL (if required)
[signature] M.C. Davenport 3/19/98 Signature of EDT Originator / Date	Authorized Representative for Receiving Organization / Date	[signature] J.W. Bailey 3/19/98 Design Authority/ Cognizant Manager / Date	Ctrl. No. [] Approved [] Approved w/comments [] Disapproved w/comments

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Project W-320 Tank 106-C Waste Retrieval Study Analysis Session Report

John W. Bailey
Numatec Hanford Co., Richland, WA 99352
U.S. Department of Energy Contract DE-AC09-96RL13200

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Abstract: This supporting document has been prepared to make the Kaiser Engineers Hanford Company "Project W-320 Tank 106-C Waste Retrieval Study Analysis Session Report" readily retrievable.

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W-320-04

August 17, 1993

John W. Bailey
Westinghouse Hanford Company
P.O. Box 1970
Richland, Washington 99352

Dear Mr. Bailey:

PROJECT W-320 TANK 106-C WASTE RETRIEVAL STUDY ANALYSIS SESSION REPORT

Attached is the final report documenting the Study Analysis Session that was held to review the characterization data and select a destination double-shell tank and sluicing medium for Project W-320. The report documents the process that was followed during the July 27-29, 1993, meetings held at the Bookwalter Winery in Richland. The action plan developed during the meeting is included in the first section of the report.

We hope that the facilitation services and decision analysis process followed during the session met your needs. We look forward to serving you in the future as the project evolves.

Thank you for your help in assembling an effective team that was able to successfully complete our objectives.

Sincerely,

Stephen W. Bork

Stephen W. Bork, PE
Real Quality and Value Engineering

SWB for RA Harrington

Richard A. Harrington, AVS
Real Quality and Value Engineering

SWB:lat

Attachments

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Study Analysis Session Report
W-320, Tank 106-C Waste Retrieval

Introduction

This facilitated session was requested by Westinghouse Hanford Company (WHC) to review the characterization data and select the best alternatives for a double-shell receiver tank and for a sluicing medium for Tank 106-C waste retrieval. The team was composed of WHC and Kaiser Engineers Hanford Company (KEH) personnel knowledgeable about tank farm operations, tank 106-C requirements, tank waste characterization and analysis, and chemical processing. This team was assembled to perform a structured decision analysis evaluation and recommend the best alternative-destination double-shell tank between tanks 101-AY and 102-AY, and the best alternative sluicing medium among dilute complexant (DC), dilute noncomplexant (DNC), and water.

The session was facilitated by Richard Harrington and Steve Bork of KEH and was conducted at the Bookwalter Winery in Richland from 7:30 a.m. to 4:00 p.m. from July 27 through July 29, 1993. Attachment 1 (Scope Statement Sheet) identifies the team members, scope, objectives, and deliverables for the session.

Background

In October 1992 a study was conducted to select among eight sluicing alternatives for removing waste from tank 106-C. In December 1992 a decision was made to use tank-to-tank sluicing (past-practice sluicing) as the method for waste retrieval. Initially, tank 102-AY was selected as the double-shell tank (DST) receiver. Tanks 101-AY and 106-AN were also considered. However, 106-AN as a receiver tank didn't support the Tri-Party Agreement (TPA) due to vent system modifications that were required; and there was no core sample from 101-AY, which was recognized as a serious regulatory constraint. Since a core sample had been taken and analyzed for 102-AY, it was selected as the receiver tank.

The current belief for the project is that there won't be a safety issue with use of either DST, and that the choice may hinge on cost and waste management operations issues.

Tank 106-C has a current heat load of approximately 120,000 Btu/hr and is assumed not to leak. It is a watch list tank, but does not have any unresolved safety questions. Solution of the tank 106-C high-heat issue is the fourth item on the list of number one priorities.

A waste compatibility study and data compendium were performed to summarize the compatibility requirements and characterization data, compare the characterization data with the requirements, and draw some conclusions about compatibility. The study concluded that based on compatibility, tank 101-AY was favored, but based on available volume and other operations considerations, tank 102-AY was favored. The study also concluded that "the data inconsistencies, age, and lack of specific analyses strongly suggest the need for additional study."

Project W-320, which is the definitive design phase for the 106-C waste retrieval system, needed a tank selection as a basis for proceeding with design. In the absence of a conclusive compatibility study, the study analysis session convened a group of subject matter experts to review the available data, and based on their expertise and judgement, reach a decision on a DST receipt tank.

Consistent with the need to clarify and resolve the results of the compatibility study and data compendium and to reach a decision on the optimum DST receipt tank, the original objectives and deliverables of the session were as follows:

Objectives

- Review the characterization data sources and identify any potentially questionable analytical results and potentially significant/unexpected results;
- Develop among the team a mutual understanding of issues associated with tanks 101-AY and 102-AY and the retrieval process; and
- Relying on the best available information, reach consensus on selecting either 101-AY or 102-AY as the DST receipt tank for the sluiced wastes from tank 106-C.

Deliverables

- Recommend changes to the baseline characterization data for Project W-320 systems;
- Document the process used during the session that results in the most appropriate receipt tank recommendation; and
- List the actions needed to support the justification and implementation of the decisions of the group.

Results

Through the use of decision analysis techniques, the group reached consensus on the following:

- Use tank 102-AY as the preferred double-shell receiver tank; and
- Use dilute complexant (DC) as the preferred sluicing medium.

The following paragraphs describe how the session progressed and the detailed results of the session.

Waste Compatibility Study/Data Compendium

A summary of the waste compatibility study (see Attachment 2) performed by WHC was presented by its author, Scott Estey. The critical assumptions and study limitations were reviewed and discussed. The study results suggested, but did not conclude, that total organic carbon (TOC) and plutonium would be the drivers for compatibility. The study also indicated that both of these measures have questionable values.

A single core sample has been taken from tank 102-AY and no core sample has been made from 101-AY. In addition to the sparse data, waste transfers have been on-going since the sampling and analyses were performed, so none of the characterization data would fully describe the current tank contents.

A data compendium prepared by Bruce Castaing of KEH was then presented. The compendium is a summary of numerous reports and analyses over the years, reduced to common units and reported with averages and ranges where more than one value was available. Ranges were highlighted if the high value was more than double the low value.

After discussion, the group agreed that TOC, TRU, and chlorides were the critical constituents for compatibility. The following summary table was prepared to provide basic reference data.

Supernate				
Tank		106-C	101-AY	102-AY
TOC	Hi	20,000 mg/l	6,780 mg/l	0.227 M (2.7 g/l)
	Avg	11,260 mg/l	5,735 mg/l	0.092 M (1.1 g/l)
	Lo	2,520 mg/l	4,470 mg/l	0.024 M (0.29 g/l)
TRU	Hi	--	42 μCi/l	--
	Avg	992 μCi/l	31 μCi/l	0.235 μCi/l
	Lo	--	20 μCi/l	--

Table 1. Critical Constituents Summary - Supernate

Chlorides				
Tank		106-C	101-AY	102-AY
Supernate	Hi	802 mg/l	518 mg/l	604 mg/l
	Avg	554 mg/l	402 mg/l	426 mg/l
	Lo	147 mg/l	430 mg/l	107 mg/l

Chlorides					
Tank			106-C	101-AY	102-AY
Solids		Hi	--	--	--
		Avg	255 mg/kg*	--	8,342 mg/kg
		Lo	--	--	--

*solids/liquid

Table 2. Critical Constituents Summary - Chloride

The original value for chloride solids in tank 102-AY was 85,000 mg/kg, which raised considerable concern among the team members. During the subsequent discussion, it was discovered that value was in error and had been superseded by the value shown in the table above (8342 mg/kg).

Considerable discussion centered on whether the supernate and solids in the various tanks were TRU and/or complexed. The seven compatibility document criteria (see Attachment 3) were discussed to clarify the compatibility requirements. The criteria are in the process of being revised, but they provide a framework for assessing compatibility.

As the meeting progressed, it became apparent that clear, recent, noncontradictory analytical results were not available to support a consensus about the nature of the wastes in 106-C, 101-AY, and 102-AY. The uncertainty particularly involved whether the 106-C liquids are TRU and/or complexed, and whether the 101-AY supernate are complexed.

Given the available information and the need for a decision regarding a DST receiver tank to support project W-320 design, a "truth table" was constructed to capture the group's consensus on whether the supernate and solids of each tank were TRU and/or complexed. In the absence of validated analytical results to support conclusions, the consensus was based on the attendees' best professional judgment, knowledge of the history of the tank, and the available analytical information. The "truth table" is contained in Attachment 4 and has clarifying footnotes to document the basis.

Evaluation Criteria Selection

The group then proceeded with selecting and weighting the criteria that would be used for selecting among the alternatives. The following criteria were initially selected for weighting:

- Impact to project baseline
- Minimize creation of liquid TRU waste
- Tank configurations
- Minimize total solids volume in receiver tank
- Cost (initial and life cycle)

- Schedule
- Support interprogram interfaces
- Support waste minimization.

Before using the criteria, a paired comparison analysis was completed to assess the relative importance of each criteria by applying specific numerical weights. The paired comparison charts for weighting analysis are contained in Attachment 5. The criteria and weighting for comparison of tank 101-AY and 102-AY are as follows:

Schedule	34%
Support interprogram interfaces	21%
Initial cost	20%
Minimize creation of liquid TRU waste	10%
Support waste minimization	6%
Life-cycle cost	5%
Tank physical configuration	4%

For evaluating the sluicing feed material options, an additional criterion of likelihood for success was added and a paired comparison analysis was completed. The resulting criteria and weighting for comparison of sluicing mediums are as follows:

Likelihood for success	30%
Schedule	28%
Minimize creation of liquid TRU waste	13%
Support waste minimization	13%
Support interprogram interfaces	9%
Life-cycle cost	7%

With the evaluation criteria established, the option sets were defined in preparation for the evaluation of alternatives.

Option Identification

The tank options selected before the meeting were tanks 101-AY and 102-AY. The group discussed the constraints that led to dropping tank 106-AN from consideration. It was agreed that reopening the issue of tank 106-AN was beyond the scope of this meeting and that 101/102-AY were the only options to be considered.

Seven initial options for the sluicing medium were discussed:

- 101-AY supernate (DC)
- 102-AY supernate (DNC)
- Evaporator condensate
- DNC from any available tank
- Water
- C-018 condensate
- Design the process to accommodate any combination of the above.

After discussion, the team narrowed the options for evaluation to three: DC, DNC, and water.

Evaluation of Options

With the options identified and the evaluation criteria established, the team rated each alternative against each criterion using a scale of 1 (poor) to 10 (excellent). The ratings were entered into an evaluation matrix which was used to record the ratings, total points, and rank for each option.

Tank 102-AY was ranked higher than 101-AY for the schedule and initial cost criteria since there was an existing core sample and analysis to support compatibility studies and regulatory approvals. The evaluation was virtually even on all the other criteria, hence tank 102-AY was selected as the most desirable double-shell receipt tank.

Another evaluation was performed to test the sensitivity of the selection to the need for a core sample of tank 101-AY waste. In this scenario, it was assumed that a core sample for 101-AY would not be needed, thus making it closer to 102-AY on initial cost and schedule. This evaluation still showed that tank 102-AY was the preferred alternative, although by a very slight margin.

The group then ranked the sluicing medium options against the criteria developed for evaluation. The options were rated virtually even on the two highest weighted criteria, which accounted for 58% of the weight. However, the remaining criteria were strong discriminators and resulted in the selection of DC as the preferred sluicing medium alternative.

The evaluation matrices with the specific ratings against the criteria, total points, and ranking are contained in Attachment 6.

Action Items

Prior to developing the action item list, the group developed a schedule logic to guide and focus the priorities. The group then reviewed the issues, information needed, assumptions, and memories and listed the actions that needed to be accomplished to resolve issues, get information, and keep the project moving. The action items were then assigned to an individual(s) with a completion date. The compiled action item list is shown below.

Action Plan		
Item	Who	When
1. Complete Study Analysis Session Report.	Steve Bork, KEH Rick Harrington, KEH	August 18, 1993

Action Plan		
Item	Who	When
2. Provide copies of reduced flipcharts to all attendees.	"	August 5, 1993
3. Revise the data compendium data specifically for U, Pu, and Am. (will be issued as a supporting document).	Bruce Castaing, KEH	August 12, 1993
4. Issue letter from Technology Applications documenting that the choice between tanks is not a safety concern.	Scott Estey, WHC John Harris, WHC	TBD
5. Issue documentation from Systems Engineering specifying operation of ALCs to validate that no ALCs are needed.	Ryan Dodd, WHC	September, 1994
6. Write a final compatibility document.	Ryan Dodd, WHC Scott Estey, WHC	TBD
7. Develop a draft flowsheet for W-320.	Scott Estey, WHC	November 1, 1993
8. Develop waste management transfer plan to support W-320 and sludge washing operation.	Ryan Dodd, WHC Graham MacLean, WHC	October 1, 1993
9. Write a lab testing procedure for waste mixing. Complete direction to laboratories (includes TGA/DSC analyses).	John Harris, WHC John Propson, WHC	TBD
10. Arrange (get scheduled) vapor space/supernate samples for 106-C and 101-AY to validate the DC waste spec and validate inputs to CAA documentation.	Tim Shaw, WHC John Harris, WHC	September 1, 1993
11. Evaluate and revise the current tank waste compatibility criteria document.	Scott Estey, WHC Godfrey, WHC	December 1, 1993
12. Evaluate PNL capability to evaluate waste for complexants.	John Harris, WHC	TBD
13. Coordinate/prepare a thermal analysis study of the combined 106-C and 102-AY solids.	Scott Estey, WHC Walt Knecht, WHC	November 1, 1993
14. Confirm solids level in both AY tanks.	John Harris, WHC Matt Tiffany, WHC	October 1, 1993

Action Plan		
Item	Who	When
15. Obtain process knowledge on AY tanks for final compatibility documents, for independent corrosion assessments.	John Harris, WHC Matt Tiffany, WHC	December 1, 1993
16. Develop specification for bounding DC waste. -support flowsheet -support CAA documentation	John Bailey, WHC Scott Estey, WHC	October 1, 1993
17. Track new criticality report (CSER). Note: this is ongoing.	John Bailey, WHC Vail, WHC	December 30, 1993
18. Track JCO addendum to increase fissile inventory in DSTs.	John Bailey, WHC Vail, WHC	October 1, 1993
19 Confirm long range action items are on the project schedule.	John Bailey, WHC John Harris, WHC	September 1, 1993

The study concluded with a round robin feedback session to verify that the needs of the meeting attendees had been met. It was agreed that the group had accomplished their objectives and deliverables and were ready to continue with definitive design and other project activities.

Supporting Documentation

During the meeting notes were taken on flipcharts. The reduced meeting notes and documentation are contained in Attachment 7.

LIST OF ATTACHMENTS

ATTACHMENT 1	SCOPE STATEMENT SHEET
ATTACHMENT 2	WASTE COMPATIBILITY STUDY SUMMARY
ATTACHMENT 3	COMPATIBILITY DOCUMENT CRITERIA
ATTACHMENT 4	"TRUTH TABLE" AND CLARIFYING NOTES
ATTACHMENT 5	EVALUATION CRITERIA WEIGHTING ANALYSIS
ATTACHMENT 6	EVALUATION MATRICES
ATTACHMENT 7	SUPPORTING DOCUMENTATION

ATTACHMENT 1

SCOPE STATEMENT SHEET

Print Date: August 17, 1993

PROJECT SCOPE STATEMENT SHEET

Project Title: TANK 106-C WASTE RETRIEVAL No. W-320

Location of Session: Bookwalter Winery Conference Room, 710 South Windmill Rd., Richland (from downtown Richland, on 182 west, take Kennedy Rd. exit, turn left on Kennedy Rd., go about 1/2 mile, turn left onto Columbia Dr., follow signs to the Park & Ride (about 100 yards). Winery is clearly visible from the Park & Ride parking lot).

Dates & Time: JULY 27-29, 1993, 7:30 - 4:00 daily with a lunch break

TEAM MEMBERS

NAME	PHONE	MISN	DISCIPLINE	CO.
John W. Bailey (TL)	372-0045	S4-55	Project Engineering	WHC
John P. Harris (TL)	372-1237	S4-55	Project Engineering	WHC
Scott D. Estey	373-2461	R2-11	Tech. Applications	WHC
Bruce A. Castaing	372-0045	S4-55	Technical Support	KEH
Graham T. MacLean	372-0405	S4-58	Pretreatment Dev.	WHC
Brian C. Landeene	372-0165	S4-58	Pretreatment Dev.	WHC
Robert A. Watrous	376-2597	G6-08	HWVP	WHC
Ryan A. Dodd	373-5629	R1-51	Systems Engr. -DSTs	WHC
Kelly G. Carothers	373-4556	R1-51	Systems Engineering	WHC
David E. Bowers	373-1841	S6-01	Tank Farm Operations	WHC
Matthew S. Tiffany	373-2148	R1-51	Systems Engr. -DSTs	WHC
Daniel A. Reynolds	373-3115	R2-11	Tech. Applications	WHC
Robert E. VanderCook	373-9137	S6-17	Proc. Analytical Labs	WHC
Harry Babad	373-2897	R2-78	Waste Tank Safety	WHC

Team Leader (TL)

FACILITATOR

NAME	PHONE	MISN	DISCIPLINE	CO.
R. A. (Rick) Harrington	376-2331	E6-66	Value Engineering	KEH
S. W. (Steve) Bork	376-5212	E6-66	Value Engineering	KEH

STUDY SCOPE

All available data (sources listed below) on the waste characteristics on wastes in tanks 241-C-106 (C-106), 241-AY-102 (AY-102), and 241-AY-101 (AY-101); and waste management issues associated with the use of either of the two AY Farm tanks as the DST receiver for the C-106 wastes will be included in the Study Analysis Session.

AVAILABLE DATA SOURCES

- Baseline Waste Characterization Data (from approved Project FDC)
- Supplemental Waste Characterization Data (from KEH review)
- Waste Compatibility Study; WHC-SD-WM-ES-244, "241-C-106 to 241-AY Tank Farm Waste Transfer Compatibility Study (Preliminary)
- Summary of Waste Management Issues

OBJECTIVES

- To review the characterization data sources and identify any potentially questionable analytical results and potentially significant/unexpected results.
- To develop among the team a mutual understanding of issues associated with tanks 101-AY and 102-AY and the retrieval process.
- Relying on the best available information, reach consensus on selecting either 101-AY or 102-AY as the DST receipt tank for the sluiced wastes from tank 106-C.

DELIVERABLES

- Recommend changes to the baseline characterization data for the Project W-320 systems.
- Documentation of the process used during the session that results in the most appropriate receipt tank recommendation.
- A list of actions needed to support the justification and implementation of the decisions of the group.

ATTACHMENT 2

WASTE COMPATIBILITY STUDY SUMMARY

Compatibility Study Summary

Specific Study Assumptions and Limitations

a. Tank characterization is assumed as the non-weighted average of all sample analyses.

b. Use of 101-AY supernatant was not allowed in the retrieval process.

c. Amount of liquid used in the sluicing operation is 690 Kgal.

d. If solids TOC is reported without a $\%H_2O$, it is assumed on a dry basis. If reported with a $\%H_2O$, TOC is assumed to be on a wet or bulk basis.

e. Other solids are assumed to be on a wet or bulk basis. If no density is given, the solids density is assumed to be 1.4.

f. Unless indicated otherwise, phosphorus is present as phosphate (PO_4^{3-}).

g. Unless indicated otherwise, TIC is present as carbonate (CO_3^{2-}).

h. Solid phase aluminum is gibbsite ($Al(OH)_3$). Soluble aluminum is aluminate ($Al(OH)_4^-$).

i. The 690 Kgal of sluicing liquid will solubilize the NO_3^-, NO_2^-, PO_4^{3-}, CO_3^{2-}, SO_4^{2-}, and F^- in 106-C sludge. $Al(OH)_3$ remains as a solid.

j. If a liquid density needs to be assumed, it is 1.15 for 106-C and 1.00 for AY farm supernatants.

k. All reported Pu is ^{239}Pu.

l. A reported value of less than the minimum detectable limit (MDL) is considered equal to the MDL.

m. If multiple analyses are run on the same sample, the averaged value of those analyses is reported as the assay for that sample.

n. $[OH^-]$ is calculated by using the definition of pH with the ion product of water, even if $[OH^-]$ is reported in the analysis.

o. If different analysis methods are performed for the same component, the highest reported concentration is used, unless the descriptive narrative of the lab report indicates otherwise.

p. The study did not differentiate between interstitial liquids and supernatants.

Compatibility Study Summary

General Limitations

- lack of AY-farm characterization (only 1 core sample analysis from 102-AY; no core sampling has been performed on 101-AY)
- waste transfers have occurred in the tanks subsequent to some of the historical sample analyses

Summary of Findings

- Tank farm waste compatibility:

  106-C waste matches 101-AY waste. Both 106-C and 101-AY have:

    NCPLX solids

    CPLX & TRU supernatants

  106-C waste does not match 102-AY waste. 102-AY has:

    CPLX solids

    NCPLX supernatant which is (most likely) not TRU

- Tank farm operational/chemistry requirements are not a problem
- 106-C waste heat content is not a problem

Compatibility Study Summary

Selected Summary of Findings

Supernatants	C-106	AY-101	AY-102
density (g/ml)	1.16	1.10	1.02
TOC (g/l)	9.3	11.0	1.9
$[OH^-]$ (M)	2.0E-4	0.21	3.2E-5
$[NO_2^-]$ (M)	0.20	0.92	0.020
$[NO_3^-]$ (M)	1.00	0.63	0.25
$[PO_4^{3-}]$ (M)	0.036	0.010	0.0021
$[Al(OH)_4^-]$ (M)	0.011	-	0.0025
$[Na^+]$ (M)	4.3	1.9	0.58
^{239}Pu inventory (kg)	0.7	0.0	0.0
TRU concentration (nCi/g)	>300	>2.1	>0.23
exotherms noted?	yes	no	no

Solids	C-106	AY-101	AY-102
density (g/ml)	1.6	-	1.4
TOC (wt% dry basis)	0.33	2.48	10.0
hydroxides (M)	2.3E-4	-	-
nitrites (M)	0.80	-	0.090
nitrates (M)	0.028	-	0.015
phosphates (M)	0.89	-	0.025
sodium compounds (M)	4.3	-	2.5
^{239}Pu inventory (kg)	55.9	44.0	10.5
TRU concentration (nCi/g)	>2,900	>6,100	>3,800

ATTACHMENT 3

COMPATIBILITY DOCUMENT CRITERIA

Compatibility Document Criteria

("Seven Thou Shalts")

1. If a waste stream is known to contain organic complexants (as their main ingredient) then that waste is complex.

2. Waste that would contain TOC values greater than 10 g/l evaporated to DSSF shall be segregated.

3. Waste containing > 3% TOC on a dry weight basis shall be segregated.

4. Waste that comes in contact with TRU solids must not mobilize the TRU in the solids.

5. If waste contains > 0.1 M phosphates, it shall not be mixed with high salt or cladding waste.

6. If waste exhibits exothermic reactions when below 200 C it shall be segregated.

7. If waste exhibits energy releases from exotherms in excess of energy absorption from endotherms it shall be segregated (if below 500 C).

ATTACHMENT 4

"TRUTH TABLE" AND CLARIFYING NOTES

"Truth Table" and Clarifying Notes

The following table was constructed to capture the consensus of the attendees with respect to the nature of the tank wastes.

Truth Table			
		TRU (spec = 100 nCi/g)	Complexed (10 g/l or 1% C)
Tank 106-C	Solids	Y (1)	N (4)
	Liquids	Y [?] (2)	? (2)
Tank 101-AY	Solids	Y (1)	? (5)
	Liquids	Y (3)	Y (6)
Tank 102-AY	Solids	Y (1)	Y (4)
	Liquids	N (4)	N (1,7)

Legend:

Y = yes
N = no
? = don't know

Clarifying Notes:

1. Process knowledge and is supported by available sample analysis.

2. Sample data supports TRU/complexant designation. A possible degradation of complexants is expected. (ie samples were taken 7 years ago)

3. A known transfer about 2 years ago of > 400 nCi/g liquid into 101-AY and process knowledge.

4. Based on historical sample data.

5. Insufficient sample data available.

6. Classified a complex based on compatibility document criteria #1.
   Note: Designated as tank farm DC receiver tank.

7. Tank designated as tank farm DNC receiver tank.

ATTACHMENT 5

EVALUATION CRITERIA WEIGHTING ANALYSIS

Sluicing Medium Options Criteria Weighting

	B	C	D	E	F	G	Points	%	Criterion
A	B1	A3	A1,D1	E3	A3	G3	7	13%	A. Minimize Liquid TRU
B		C1	B3	E3	B1	G1	5	9%	B. Inter-program Interfaces
C			D3	E5	F3	G3	1	0%	C. Initial Cost
D				E3	F3	G3	4	7%	D. Life Cycle Cost
E					E1,F1	G3	15	28%	E. Schedule
F						G3	7	13%	F. Support Waste Minimization
G							16	30%	G. Likelihood for Success
							55	100%	

5 = Much more important
3 = Moderately more important
1 = Minimally more important

Tank Selection Criteria Weighting

	B	C	D	E	F	G	H	I	Points	%	Criterion
A	B5	A5	D1	E1	F5	G3	A3	A3	11	10%	A. Minimize Liquid TRU
B		B5	B1	B3	F5	B3	B3	B3	23	21%	B. Inter-program Interfaces
C			D5	E1	F5	G1	H1	I3	0	0%	C. Minimize Total Solids
D				D3	F3	D3	D5	D5	22	20%	D. Initial Cost
E					F5	G1	E3	E1	6	5%	E. Life Cycle Cost
F						F5	F5	F5	38	34%	F. Schedule
G							G1	G1	7	6%	G. Support Waste Minization
H								I1	1	0%	H. Impact to Project Baseline
I									4	4%	I. Tank Physical Configuration
									112	100%	

5 = Much more important
3 = Moderately more important
1 = Minimally more important

ATTACHMENT 6

EVALUATION MATRICES

W320_3.XLS

Tank Evaluation Matrix

(With 101-AY Core Sample)

	Schedule	*Program Interfaces*	*Initial Cost*	*Minimize Liquid TRU*	*Support Waste Min*	*Life Cycle Cost*	*Tank Configuration*		
Weight	34%	21%	20%	10%	6%	5%	4%	Points	Rank
Tank 101-AY	6 / 204	8 / 168	9 / 180	5 / 50	5 / 30	5 / 25	5 / 20	677	2
Tank 102-AY	10 / 340	6 / 126	10 / 200	5 / 50	5 / 30	5 / 25	5 / 20	791	1

Legend:

10 / 340	
10	◄— Evaluation Score on a 1 to 10 Scale (1=poor; 10=excellent)
340	◄— Weighted Score - Evaluation x Weight %

W320_4.XLS

Tank Evaluation Matrix

(Without 101-AY Core Sample)

	Schedule	Program Interfaces	Initial Cost	Minimize Liquid TRU	Support Waste Min	Life Cycle Cost	Tank Configuration		
Weight	34%	21%	20%	10%	6%	5%	4%	Points	Rank
Tank 101-AY	8 / 272	8 / 168	10 / 200	5 / 50	5 / 30	5 / 25	5 / 20	765	2
Tank 102-AY	10 / 340	6 / 126	10 / 200	5 / 50	5 / 30	5 / 25	5 / 20	791	1

Legend:

10 / 340
◄— Evaluation Score on a 1 to 10 Scale (1=poor; 10=excellent)
◄— Weighted Score = Evaluation x Weight %

W320_5.XLS

Sluicing Medium Evaluation Matrix

	Likelihood for Success	Schedule	Support Waste Min	Minimize Liquid TRU	Interprogram Interfaces	Life Cycle Cost		
Weight	30%	28%	13%	13%	9%	7%	Points	Rank
DC (Dilute Complexant)	8 / 240	9 / 252	10 / 130	10 / 130	10 / 82	10 / 70	904	1
DNC (Dilute Non-Complexant)	9 / 270	9 / 252	10 / 130	1 / 13	5 / 45	5 / 35	745	2
Water	10 / 300	10 / 280	1 / 13	1 / 13	1 / 9	1 / 7	622	3

Legend:

10	← Evaluation Score on a 1 to 10 Scale (1=poor; 10=excellent)
340	← Weighted Score - Evaluation x Weight %

ATTACHMENT 7

MEETING NOTES AND DOCUMENTATION

Meeting Notes and Documentation

Assumptions:

- After moving solids to the DST - we won't be able to operate the ALCs.
- Heat transfer study will be done to confirm acceptability of high heat solids in the selected tanks.
- A new criticality study (CSER) will be done. Increase the allowable tank fissile inventory to 125 kg/tank.
- Can move supernate from either 101-AY or 102-AY.
- Project W-320 has priority for use of AY tanks over sludge washing.
- For W-320 to work we need available tank space.
- Current solids in 101-AY have similar physical characteristics to the solids in 102-AY.
- For regulatory permitting we will specify composition of streams.

Issues:

- Samples used for the analyses may not be representative of tank contents.
- Sample analyses don't break out solids/sludges as:
  -insoluble solids
  -water
  -dissolved solids
- Heat transfer model (study) must confirm acceptability of high heat solids in the selected DST.
- Is 106-C tank waste complexed?
- TOC values of 11 g/l are skewed by a single value of ~20 g/l - all others are on the order of 4 g/l.
- Discrepancies in Pu and TRU content - may not be based on a representative sample.
- TOC is not a direct indicator of whether the waste is complexed or not.
- Old analysis (20 years old) showed 106-C waste exhibited exotherms at less than 232 C. Waste compatibility criteria requires waste that exhibits exothermic reactions to be segregated.
- Tank farm waste compatibility document does not experimentally validate tank waste compatibility.

Memories:

- Consider 3rd tank to handle excess overflow.
- Pretreatment tank needs.
- Aging waste IOSRs - when do we have to operate ALCs?
- The results of a process test on ALCs will be available 1/94.
- Historically, maximum temperature 106-C has been was 235 F. Maximum temperature for any one year was an average of 185 F.
- Total solids in 106-C is 197,000 gallons. We anticipate to leave 48,000 gallons. The difference of approximately 149,000 gallons will be transferred. (approximately 55").
- Revise data compendium to include TRU on spreadsheet.
- The tank supernates are a moving target.
- Use material from all three tanks (106-C, 101/102-AY) and develop some lab tests for the final compatibility document.
- Compatibility document criteria item #2 needs to be revised.
- Have sludge washing program evaluate switching from AZ to the 106-C solids.
- Develop creative funding to get a better tank, ie 106-AN.
- Waste tank safety program acknowledged that the choice between tanks is not a safety concern.

Information Needed:

- Supernate samples from two tanks (106-C and 101-AY).
- Look at PNL waste/evaporator documentation - includes 340 and 204-AR operations.
- Look for explanation for high sodium in 102-AY.
- Obtain process knowledge on 101-AY and 102-AY. (for final compatibility study).
- Is 1-1/2 feet difference in solids depth a discriminator for AY farm retrieval and/or homogenization sampling?
- Confirm solids level in both AY tanks.

Schedule Logic:

- Flow sheet developed in detail.
- Plan for sampling.
- Specification for DC waste in support of CAA/permitting and exhauster definitive design.
- Specification for solids from receipt tank and specification for DC in support of the independent integrity and corrosion assessments.
- Conduct safety assessments.
- Develop waste transfer scenario (waste management/compatibility).
- Process knowledge review.