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PAGE COUNT 23

ACCESSION # D197244004

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ENGINEERING CHANGE NOTICE

Page 1 of 2

1. ECN 635525

Proj. ECN

2. ECN Category (mark one)	3. Originator's Name, Organization, MSIN, and Telephone No.	4. USQ Required?	5. Date
Supplemental [] Direct Revision [X] Change ECN [] Temporary [] Standby [] Supersedure [] Cancel/Void []	Jim G. Field, Data Assessment and Interpretation, R2-12, 376-3753	[] Yes [X] No	08/06/97
	6. Project Title/No./Work Order No. Tank 241-AW-106	7. Bldg./Sys./Fac. No. 241-AW-106	8. Approval Designator N/A
	9. Document Numbers Changed by this ECN (includes sheet no. and rev.) HNF-SD-WM-ER-365, Rev. 1	10. Related ECN No(s). ECN-635464	11. Related PO No. N/A

12a. Modification Work	12b. Work Package No.	12c. Modification Work Complete	12d. Restored to Original Condition (Temp. or Standby ECN only)
[] Yes (fill out Blk. 12b) [X] No (NA Blks. 12b, 12c, 12d)	N/A	N/A Design Authority/Cog. Engineer Signature & Date	N/A Design Authority/Cog. Engineer Signature & Date

13a. Description of Change

13b. Design Baseline Document? [] Yes [X] No

This ECN was generated to include additional explanatory text in the best-basis narrative, and to update the comprehensive radionuclide inventory estimates for the tank.

14a. Justification (mark one)

Criteria Change	[]	Design Improvement	[X]	Environmental	[]	Facility Deactivation	[]
As-Found	[]	Facilitate Const	[]	Const. Error/Omission	[]	Design Error/Omission	[]

14b. Justification Details

Initial release of this document was deficient.

15. Distribution (include name, MSIN, and no. of copies)

See attached distribution.

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A-7900-013-1

ENGINEERING CHANGE NOTICE

1. ECN (use no. from pg. 1) ECN-635525

16. Design Verification Required	17. Cost Impact						18. Schedule Impact (days)	
	ENGINEERING			CONSTRUCTION				
[] Yes	Additional	[]	$	Additional	[]	$	Improvement	[]
[X] No	Savings	[]	$	Savings	[]	$	Delay	[]

19. Change Impact Review: Indicate the related documents (other than the engineering documents identified on Side 1) that will be affected by the change described in Block 13. Enter the affected document number in Block 20.

SDD/DD	[]	Seismic/Stress Analysis	[]	Tank Calibration Manual	[]
Functional Design Criteria	[]	Stress/Design Report	[]	Health Physics Procedure	[]
Operating Specification	[]	Interface Control Drawing	[]	Spares Multiple Unit Listing	[]
Criticality Specification	[]	Calibration Procedure	[]	Test Procedures/Specification	[]
Conceptual Design Report	[]	Installation Procedure	[]	Component Index	[]
Equipment Spec.	[]	Maintenance Procedure	[]	ASME Coded Item	[]
Const. Spec.	[]	Engineering Procedure	[]	Human Factor Consideration	[]
Procurement Spec.	[]	Operating Instruction	[]	Computer Software	[]
Vendor Information	[]	Operating Procedure	[]	Electric Circuit Schedule	[]
OM Manual	[]	Operational Safety Requirement	[]	ICRS Procedure	[]
FSAR/SAR	[]	IEFD Drawing	[]	Process Control Manual/Plan	[]
Safety Equipment List	[]	Cell Arrangement Drawing	[]	Process Flow Chart	[]
Radiation Work Permit	[]	Essential Material Specification	[]	Purchase Requisition	[]
Environmental Impact Statement	[]	Fac. Proc. Samp. Schedule	[]	Tickler File	[]
Environmental Report	[]	Inspection Plan	[]		[]
Environmental Permit	[]	Inventory Adjustment Request	[]		[]

20. Other Affected Documents: (NOTE: Documents listed below will not be revised by this ECN.) Signatures below indicate that the signing organization has been notified of other affected documents listed below.

Document Number/Revision	Document Number/Revision	Document Number Revision
N/A		

21. Approvals

	Signature	Date		Signature	Date
Design Authority			Design Agent		
Cog. Eng. J.G. Field	J G Field	8/20/97	PE		
Cog. Mgr. K.M. Hall	Kathleen M. Hall	8/20/97	QA		
QA			Safety		
Safety			Design		
Environ.			Environ.		
Other			Other		

DEPARTMENT OF ENERGY

Signature or a Control Number that tracks the Approval Signature

ADDITIONAL

SEP 1997 RECEIVED OSTI

Tank Characterization Report for Double-Shell Tank 241-AW-106

Jim G. Field
Lockheed Martin Hanford, Corp., Richland, WA 99352
U.S. Department of Energy Contract DE-AC06-96RL13200

EDT/ECN: ECN-635525 UC: 2070
Org Code: 74620 Charge Code: N4G3A
B&R Code: EW 3120074 Total Pages: 111

Key Words: Waste Characterization, Double-Shell Tank, DST, Tank 241-AW-106, 241-AW-106, AW-106, AW Farm, Tank Characterization Report, TCR, Waste Inventory, TPA Milestone M-44

Abstract: This document summarizes the information on the historical uses, present status, and the sampling and analysis results of waste stored in Tank 241-AW-106. This report supports the requirements of the Tri-Party Agreement Milestone M-44-05.

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Kara J. Broz 9/22/97
Release Approval Date

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ID: 3
AUG 22 1997
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Approved for Public Release

RECORD OF REVISION	(1) Document Number HNF-SD-WM-ER-365	Page 1

(2) Title
Tank Characterization Report for Double-Shell Tank 241-AW-106

CHANGE CONTROL RECORD

(3) Revision	(4) Description of Change - Replace, Add, and Delete Pages	Authorized for Release (5) Cog. Engr.	(6) Cog. Mgr. Date
0	(7) Initially released 09/28/94 on EDT-608071.	B.C. Simpson	C.S. Haller
1 RS	Incorporate per ECN-635464. cim 5/2/97	J.G. Field J G Field 4/30/97	K.M. Hall Kathleen M. Hall 4/30/97
1-A RS	Incorporate per ECN-635525.	J.G. Field J G Field 8/20/97	K.M. Hall Kathleen M. Hall 8/20/97

A-7320-005 (08/91) WEF168

APPENDIX D

EVALUATION TO ESTABLISH BEST-BASIS INVENTORY FOR DOUBLE-SHELL TANK 241-AW-106

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APPENDIX D

EVALUATION TO ESTABLISH BEST-BASIS INVENTORY FOR DOUBLE-SHELL TANK 241-AW-106

An effort is underway to provide waste inventory estimates that will serve as standard characterization source terms for the various waste management activities (Hodgson and LeClair, 1996). As part of this effort, an evaluation of available information for double-shell tank (DST) 241-AW-106 was performed, and a limited best basis inventory was established. This work, detailed in the following sections, follows the methodology that was established by the standard inventory task.

D1.0 CHEMICAL INFORMATION SOURCES

Available waste (chemical) information for tank 241-AW-106 includes:

- The previous tank characterization report (TCR) for DST 241-AW-106 (Simpson 1994) contains little information on the solids in the tank.
- Statistical report for limited analytical data on two sludge grab samples obtained in August 1995
- M.D. Guthrie, 242-A Campaign 96-1 Post Run Document, WHC-SD-WM-PE-056, Rev 0, 1996
- Mauss, B.M., 1988, *242-A Evaporator/Crystallizer Fiscal Year 1987 Campaign Run 87-2 Post-Run Document*, WHC-SD-WM-PE-035
- The inventory estimates for this tank were generated from the Hanford Defined Waste (HDW) model (Agnew, et al. 1997) developed at the Los Alamos National Laboratory (LANL).

A list of references used in this evaluation is provided at the end of this Appendix (Section D5.0).

D2.0 COMPARISON OF COMPONENT INVENTORIES

Tank 241-AW-106 is currently used as the slurry receiver tank for Evaporator 242-A. The slurry waste produced during 242-A Evaporator operations is initially transferred to tank 241-AW-106. The slurry waste is then either transferred to another double-shell tank for storage or rerouted back to 241-AW-102 for further volume reduction. Between A-Evaporator campaigns tank 241-AW-106 receives miscellaneous waste transfers for temporary storage.

The tank inventory estimates reported in Agnew et al. (1997) were valid as of January 1, 1994. There have been multiple evaporator campaigns in Evaporator 242-A since that date. Thus, the tank inventory estimates in Agnew et al. (1997) are no longer valid.

D3.0 COMPONENT INVENTORY EVALUATION

The following evaluation was conducted to assess various estimates of tank contents.

D3.1 WASTE HISTORY TANK 241-AW-106

The double-shell tank 241-AW-106 went into service in 1980. Initially, the tank received concentrated phosphate waste, non-complexed waste from B Plant cesium recovery, and flush water. Beginning in January 1983 the tank became a slurry receiver tank for the 242-A Evaporator. Over the next decade approximately 400 million liters of waste were transferred through this tank as part of the 242-A Evaporator operations. For a more complete history of the waste in this tank refer to the supporting document (Brevick, 1995) and the *Waste Volume Projection Historical Database* (Koreski, 1997). Also, see Section 2.3 of this TCR.

D3.2 EXPECTED TYPE OF WASTE BASED ON THIS ASSESSMENT

The following waste types are expected based on Agnew et al. (1997), and Hanlon (1997):

SMMA2 = a mixture of concentrated supernatant coming from the 242-A Evaporator that are a blend of other waste types that upon cooling partially precipitated as a saltcake.

BL = B Plant low-level waste

DSSF = Double shell slurry feed from the 242-A Evaporator 97-1Campaign

As of January 1, 1994, Agnew et al. (1997) identify the waste in the tank as 3.785 kL (1 kgal) of BL sludge and 4,200 kL (1,110 kgal) of SMMA2 supernatant. This waste (minus the solids heel) was processed through the 242-A Evaporator during Campaign 94-1. Tank 241-AW-106 was the slurry receiver tank for A-Evaporator campaigns 94-1, 94-2, 95-1 and 96-1. Therefore, the HDW Model values published in Agnew et al. (1997) do not provide a current estimate of tank contents.

Hanlon (1997) lists the tank as containing 852 kL (225 kgal) of sludge and 2,581 kL (682 kgal) of double shell slurry feed (DSSF) supernatant. The solids level in this tank has remained relatively constant since 1994 (Guthrie, 1996), but the supernatant level has changed continously. The DSSF supernatant was from the 242-A evaporator 97-1 campaign. Much of this supernatant is scheduled to be transferred out of the tank in September, 1997.

D3.3 ASSUMPTIONS USED

The following evaluation provides an engineering assessment of tank 241-AW-106 contents. For this evaluation, the following assumptions and observations are made:

- The HDW Model information for tank 241-AW-106 is of limited value in developing a best-basis tank inventory estimate.
- The waste transfer history for tank 241-AW-106 is too complex to allow identification of the solids heel.
- Limited analytical data from sludge grab samples offer a limited basis for tank inventory estimates.
- To a first approximation, the solids layer in tank 241-AW-106 is assumed to be comparable to the SMMA1 Saltcake composition listed in Agnew et al. (1997).

- Because the supernatant level changes constantly, supernatant inventories for this tank were not included as part of the best basis.

D3.4. BASIS FOR CALCULATIONS USED IN THIS ENGINEERING EVALUATION

The general approach in this engineering assessment was to utilize all available information to formulate the best-basis estimate of the tank's contents. The sources of information may include analytical data from samples taken from the tank of interest, analytical data from other tanks believed to contain waste types similar to those believed to be in the tank of interest, and data from models utilizing historical process records. The confidence level assigned to the best-basis inventory values then depends on the level of agreement among the various information sources. However, the liquids in tank 241-AW-106 change frequently because this tank is part of the ongoing 242-A Evaporator operations. The waste transfer records indicate that ~400 million liters of waste passed through this tank between 1983 and 1993. Because this is an active tank with frequent waste transfers, there is no attempt in this engineering assessment to develop a tank inventory estimate for the liquid phase in the tank. This assessment only addresses the solids layer.

Based on information in the 242-A Campaign 96-1 Post Run Document (Guthrie, 1996), the solids level in this tank has remained relatively constant at 852 kL (225 kgal) since the completion of Campaign 94-2. However, the solids level measurement information reported in Guthrie (1996) indicates there is an ~30% relative standard deviation associated with the solids volume estimate. This uncertainty estimate is based on the large variations in solid levels among the risers measured.

It is likely the solids layer in this tank accumulated from solids separating from A-Evaporator slurry feed. Because of the large volume of waste that has passed through this tank, and uncertainties associated with solids settling for each transfer, it was not feasible to estimate the analyte concentrations in the solids heel based on A-Evaporator process history. Therefore, empirical approaches, coupled with limited analytical data from grab samples taken from this tank in 1995 were used to estimate current tank inventories.

The approach included: 1) Use of a limited analytical data set, 2) thermodynamic modeling using the HDW model supernatant composition, 3) thermodynamic modeling using a derived double-shell slurry feed composition, and 4) assuming the solids to be comparable with the SMMA1 salt cake reported by Agnew et al. (1997).

D3.4.1 ANALYTICAL RESULTS FROM SOLIDS GRAB SAMPLES

Two solids grab samples were taken from a single riser in tank 241-AW-106 in August 1995. As can be seen by the information in Table D3-1, the scope of analyses for these sample was limited.

Table D3-1. Solids Sample Analytical Results

Radiochemical Analyte	Solids Radio-chemical Analysis Values (uCi/g)	Tank Inventory based on Analytical Results (Ci)	Non-radio-chemical Analytes	Solids Chemical Analysis Values (ug/g)	Tank Inventory based on Analytical Results (kg)
^{241}Am	0.15	249	TIC (as CO_3)	2,180 (10,900)	3,620 (18,100)
^{137}Cs	31.6	52,500	Total Carbon (TOC)	4,340 (2,160)	7210 (3,590)
$^{89/90}Sr$	53.8	89,400	U_{Total}	1,400	2,330
$^{239/240}Pu$	0.0445	73.9			
Total Alpha	0.222	369			
Total Beta	154	256,000			
^{60}Co	<0.0210	<34.9			

D3.4.2 INVENTORY ESTIMATES OF SOLIDS BASED ON SUPERNATANT COMPOSITE CONCENTRATIONS

The SMM concentrations reported in Agnew et al. (1997)(Table D3-2) were evaluated with a thermodynamically-based solubility model (OLI, 1996). (The chemical species are reported without charge designation per the best-basis inventory convention). Results from the thermodynamic model suggested that aluminum hydroxide, nickel oxide, manganese dioxide and calcium fluoride would form in a system with the reported concentration values. The model predicted the total volume of solids to be ~28 kL. The modeling results suggest a scenario where the more insoluble metal oxides would build up over an extended period of time. However, there is insufficient information to provide a quantitative estimate for the composition of the solids heel.

Table D3-2. Supernatant Mixing Model Composite Values for Tank 241-AW-106

Analyte[a]	SMM concentration estimate (moles/L)	Analyte[a]	SMM concentration estimate (moles/L)
Al	0.559	Ni	0.00475
Bi	0.00033	NO_2	0.623
Ca	0.0334	NO_3	1.65
Cl	0.104	OH	2.04
Cr	0.0411	oxalate	0.00001
F	0.147	Pb	0.00036
Fe	0.00809	PO_4	0.107
Hg	7.8E-06	Si	0.0355
K	0.153	SO_4	0.0925
Mn	0.00763	CO_3	0.398
Na	6.36	Organic Carbon	0.00049
NH_3	0.463	U_{total}	0.0000582
H_2O (Wt%)	62.4	Zr	0.00167
density (kg/L)	1.26		

D3.4.3 INVENTORY ESTIMATES OF SOLIDS BASED ON DERIVED DOUBLE-SHELL SLURRY FEED COMPOSITION

A second data set was evaluated with the solubility model to evaluate the potential for understanding solids formation in the slurry feeds that were routinely transferred through tank 241-AW-106. The slurry feed originating from evaporator campaign 87-2 was chosen because it was added to the tank in the right time frame to have contributed significantly to the solids formation in the tank, and adequate analytical data were available in the post run document (Mauss, 1988) to support the modeling effort. The data set developed from information in the post run document is shown in Table D3-3.

The model results indicated that some sodium fluoride would form in a system with this composition. The total volume of the solids was predicted to be ~38 kL. Although the modeling results do not provide a quantitative understanding of the heel in this tank, they do provide some insight into how a heel might form over a period of time. Depending on the composition of the evaporator feed material, it is likely that solubility limits were sometimes exceeded in the slurry feed.

Table D3-3. Evaporator Feed and Projected Slurry Composition for Run 87-2[a]

Analyte	Units	241-AW-103	241-AW-106	241-AY-102	Total Waste Volume
Waste Volume	kL (kgal)	2,390 (633)	2,090 (550)	1,310 (346)	5,790 (1,530)
Al	M	0.0012	0.211	<0.0018	0.145
OH	M	0.0717	2.88	0.0645	2.04
NO_2	M	0.0247	0.743	0.00547	0.526
NO_3	M	0.0733	2.33	0.0148	1.65
CO_3	M	0.00158	0.317	0.0147	0.224
SO_4	M	<0.0036	NR	0.00036	0.00218
PO_4	M	0.00089	0.0135	0.00044	0.101
Cl	M	<0.0017	NR	0.0006	0.0016
F	M	0.744	NR	0.00114	0.582
K	M	0.548	NR	<0.0005	0.428
Na	M	1.11	6.84[b]	0.106	5.56
TOC	g/L	0.055	3.15	0.256	2.29
H_2O	Wt%	90.1	69.1	~100	NA

Table D3-3. Evaporator Feed and Projected Slurry Composition for Run 87-2[a]

Analyte	Units	241-AW-103	241-AW-106	241-AY-102	Total Waste Volume
SpG	NA	1.05	1.23	0.99	NA
pH	pH units	13.3	NR	12.4	NA

NR = not reported
NA = not applicable

[a]Mauss 1988
[b]Na estimated from charge balance.
[c]The projected slurry composition for each analyte is the weighted average corrected for volume reduction achieved during evaporator campaign. The volume reduction factor for this evaporator run was 0.53.

D3.4.4. INVENTORY ESTIMATES BASED ON SMMA1 SALTCAKE VALUES

Because sludge quantities were low and analyte compositions were suspect for the sludge composition models investigated, it was determined that the best current approach would be to assume that the SMMA2 waste composition (not estimated by Agnew et al. [1997]) is similar to the SMMA1 waste composition estimated by Agnew et al. (1997). The resulting tank inventory estimates based on SMMA1 saltcake values and 1995 grab sample analytical data, when available, are included in Tables D3-4 and D3-5.

Table D3-4. Estimated Tank Inventory for Non-Radioactive Components in Tank 241-AW-106 Solids, Based on SMMA1 Saltcake and Grab Sample Analysis.

Analyte	SMMA1 Composition[b] (ug/g)	Inventory Estimate (kg)	Analyte	SMMA1 Composition[b] (ug/g)	Inventory Estimate (kg)
Al	31,700	52,600	Ni	316	525
Bi	788	1,310	NO_2	75,169	125,000
Ca	1,200	1,990	NO_3	263,183	437,000
Cl	2,160	3,580	OH	101,369	168,000
Cr	3,830	6,350	Pb	114	189
F	1,140	1,890	PO_4	21,100	35,000
Fe	456	757	Si	2,570	4,260

Table D3-4. Estimated Tank Inventory for Non-Radioactive Components in Tank 241-AW-106 Solids, Based on SMMA1 Saltcake and Grab Sample Analysis.

Analyte	SMMA1 Composition[b] (ug/g)	Inventory Estimate (kg)	Analyte	SMMA1 Composition[b] (ug/g)	Inventory Estimate (kg)
Hg	4.44	7.37	SO_4	20,800	34,500
K	2,190	3,630	TIC as CO_3[c]	10,900	18,100
Mn	159	264	TOC[d]	2,160	3,590
Na	233,000	386,000	Zr	105	174
NH_3	1,290	2,140	U_{TOTAL}	1,400	2,330
H_2O (Wt%)	22.8		Density (g/mL)[e]	1.95	

[a]Solids volume = 852 kL, Density = 1.95 g/mL
[b]Agnew et al. (1997)
[c]Based on the mean grab sample TIC value of 3,620 kg multiplied by 5
[d]Based on the mean grab sample total carbon value 7,210 kg
[e]mean density of grab samples

Table D3-5. Comparison of SMMA1 Saltcake and Grab Sample Radioactive Inventory Estimates for Tank 241-AW-106 Solids[a,b].

Analyte	SMMA1 Composition[c] (uCi/g)	SMMA1 Inventory estimate (Ci)	Solids Grab Sample (Ci)	Analyte	SMMA1 Composition[c] (uCi/g)	SMMA1 Inventory estimate (Ci)	Solids Grab Sample (Ci)
$^{89/90}Sr$	88.4	147,000	89,400	^{137}Cs	151	251,000	52,500
$^{239/240}Pu$	0.048	79.7	73.9	^{241}Am	0.030	49.8	249
^{60}Co	0.0367	61.0	<34.9				

[a]Density = 1.95 g/mL
[b]Solids volume = 852 kL
[c]Agnew et al. (1997)

D4.0 DEFINE THE BEST-BASIS AND ESTABLISH COMPONENT INVENTORIES

Information about chemical, radiological, and/or physical properties is used to perform safety analyses, engineering evaluations. and risk assessment associated with waste management activities, as well as regulatory issues. These activities include overseeing tank farm operations and identifying, monitoring, and resolving safety issues associated with these operations and with the tank wastes. Disposal activities involve designing equipment, processing and facilities for retrieving wastes and processing them into a form that is suitable for long-term storage.

Chemical and radiological inventory information are generally derived using three approaches: (1) component inventories are estimated using results of sample analyses, (2) component inventories are estimated using the HDW Model based on process knowledge and historical information, or (3) a tank-specific process estimate is made based on process flowsheets, reactor fuel data, essential material usage, and other operating data. Not surprisingly, the information derived from these different approaches is often inconsistent.

An assessment of available chemical information for tank 241-AW-106 was performed, including the following:

- An inventory estimate generated by assuming the solids to be comparable with the SMMA1 Saltcake formulation (Agnew et al. 1997). SMMA1 saltcake concentrations were multiplied by a tank volume of 852 kL and solids density of 1.95 g/mL.

- Analytical results from a solids sample collected in 1995.

Based on this HDW model/engineering assessment, a best-basis inventory was developed for tank 241-AW-106 using the limited amount of analytical data and by assuming the other solids would be comparable to the SMMA1 formulation reported by Agnew et al. (1997). These inventories are shown in Tables D4-1 and D4-2.

Best-basis inventories based on the SMMA1 waste type are estimates only, and should be considered suspect. Core samples of the solids layer in Tank 241-AW-106 are needed for more reliable analyte inventories. The inventory values reported in Tables D4-1 and D4-2 are for tank solids only and are subject to change. Refer to the Tank Characterization Database (TCD) for the most current inventory values.

Best-basis tank inventory values are derived for 46 key radionuclides (as defined in Section 3.1 of Kupfer et al. 1997), all decayed to a common report date of January 1, 1994. Often, waste sample analyses have only reported ^{90}Sr, ^{137}Cs, $^{239/240}Pu$, and total uranium, or (total beta and

total alpha) while other key radionuclides such as ^{60}Co, ^{99}Tc, ^{129}I, ^{154}Eu, ^{155}Eu, and ^{241}Am, etc., have been infrequently reported. For this reason it has been necessary to derive most of the 46 key radionuclides by computer models. These models estimate radionuclide activity in batches of reactor fuel, account for the split of radionuclides to various separations plant waste streams, and track their movement with tank waste transactions. (These computer models are described in Kupfer et al. 1997, Section 6.1 and in Watrous and Wootan 1997.) Model generated values for radionuclides in any of 177 tanks are reported in the Hanford Defined Waste Rev. 4 model results (Agnew et al. 1997). The best-basis value for any one analyte may be either a model result or a sample or engineering assessment-based result if available. (No attempt has been made to ratio or normalize model results for all 46 radionuclides when values for measured radionuclides disagree with the model.) For a discussion of typical error between model derived values and sample derived values, see Kupfer et al. 1997, Section 6.1.10.

Table D4-1. Best-Basis Inventory Estimates for Nonradioactive Solids Components in Tank 241-AW-106 (May 31, 1997).

Analyte	Total inventory (kg)	Basis (S, M, or E)[1]
Al	52,600	M/E
Bi	1,310	M/E
Ca	1,990	M/E
Cl	3,580	M/E
TIC as CO_3	18,100	S
Cr	6,350	M/E
F	1,890	M/E
Fe	757	M/E
Hg	7.37	M/E
K	3,630	M/E
La	0.753	M/E
Mn	264	M/E
Na	386,000	M/E
Ni	525	M/E
NO_2	125,000	M/E
NO_3	437,000	M/E
OH_{TOTAL}	168,000	M/E
Pb	189	M/E
PO_4	35,000	M/E

Table D4-1. Best-Basis Inventory Estimates for Nonradioactive Solids Components in Tank 241-AW-106 (May 31, 1997).

Analyte	Total inventory (kg)	Basis (S, M, or E)[1]
Si	4,260	M/E
SO_4	34,500	M/E
Sr	0	M/E
TOC	3,590	S
U_{TOTAL}	2,330	S
Zr	174	M/E

[1]S = Sample-based (Based on 1995 Grab Sample, see Appendix B)
M = Hanford Defined Waste model-based
E = Engineering assessment-based

Table D4-2. Best-Basis Inventory Estimates for Radioactive Solids Components in Tank 241-AW-106 (May 31, 1997). (2 Sheets)

Analyte	Total inventory (Ci)	Basis (S, M, or E)[1]
^{3}H	158	M/E
^{14}C	41.9	M/E
^{59}Ni	2.77	M/E
^{60}Co	<34.9	S
^{63}Ni	277	M/E
^{79}Se	4.60	M/E
$^{89/90}Sr$	89,400	S
^{90}Y	89,400	S
^{93}Zr	22.8	M/E
^{93m}Nb	16.3	M/E
^{99}Tc	204	M/E
^{106}Ru	0.0121	M/E
^{113m}Cd	125	M/E
^{125}Sb	284	M/E

Table D4-2. Best-Basis Inventory Estimates for Radioactive Solids Components in Tank 241-AW-106 (May 31, 1997). (2 Sheets)

Analyte	Total inventory (Ci)	Basis (S, M, or E)[1]
^{126}Sn	6.95	M/E
^{129}I	0.399	M/E
^{134}Cs	3.51	M/E
^{137}Cs	52,400	S
^{137m}Ba	49,500	S
^{151}Sm	16,100	M/E
^{152}Eu	6.61	M/E
^{154}Eu	924	M/E
^{155}Eu	386	M/E
^{226}Ra	1.83E-04	M/E
^{227}Ac	0.00107	M/E
^{228}Ra	0.399	M/E
^{229}Th	0.00947	M/E
^{231}Pa	0.00515	M/E
^{232}Th	0.0499	M/E
^{232}U	1.07	M/E
^{233}U	4.10	M/E
^{234}U	1.40	M/E
^{235}U	0.0564	M/E
^{236}U	0.0481	M/E
^{237}Np	0.714	M/E
^{238}Pu	2.84	M/E
^{238}U	1.83	M/E
$^{239/240}Pu$	74.0	S
^{241}Am	250	S
^{241}Pu	194	M/E
^{242}Cm	4.94E-04	M/E

Table D4-2. Best-Basis Inventory Estimates for Radioactive Solids Components in Tank 241-AW-106 (May 31, 1997). (2 Sheets)

Analyte	Total inventory (Ci)	Basis (S, M, or E)[1]
^{242}Pu	0.00121	M/E
^{243}Am	0.00249	M/E
^{243}Cm	9.96E-06	M/E
^{244}Cm	2.99E-04	M/E

[1]S = Sample-based (Based on 1995 Grab Samples, see Appendix B)
M = Hanford Defined Waste model-based
E = Engineering assessment-based

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