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Performance Requirements for the Double-Shell Tank System: Phase 1

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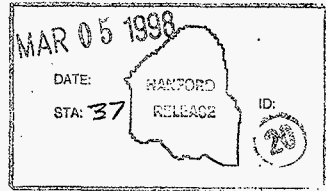
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Abstract: This document establishes performance requirements for the double-shell tank system. These requirements, in turn, will be incorporated in the *System Specification for the Double-Shell Tank System* (Grenard and Claghorn 1998).

This version of the document establishes requirements that are applicable to the first phase (Phase 1) of the Tank Waste Remediation System (TWRS) mission described in the *TWRS Mission Analysis Report* (Acree 1998). It does not specify requirements for either the Phase 2 mission or the double-shell tank system closure period.

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**PERFORMANCE REQUIREMENTS
FOR THE DOUBLE-SHELL
TANK SYSTEM: PHASE 1**

January 1998

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LIST OF TERMS

DOE	U.S. Department of Energy
DST	Double-shell tank
HLW	High-level waste
HSTBD	Hanford Site Technical Database
HTWOS	Hanford Tank Waste Operations Simulator
LAW	Low-activity waste
LERF	Liquid Effluent Retention Facility
SST	Single-shell tank
TBD	To be determined
TBP	To be published
TWRS	Tank Waste Remediation System
TWRSO&UP	Tank Waste Remediation System Operation and Utilization Plan

PERFORMANCE REQUIREMENTS FOR THE DOUBLE-SHELL TANK SYSTEM: PHASE 1

1.0 PURPOSE AND SCOPE

1.1 PURPOSE

This document establishes performance requirements for the double-shell tank (DST) system. These requirements, in turn, will be incorporated in the *System Specification for the Double-Shell Tank System* (Grenard and Claghorn 1998).

1.2 SCOPE

This version of the document establishes requirements which are applicable to the first phase (Phase 1) of the TWRS mission described in the *TWRS Mission Analysis Report* (Acree 1998). It does not specify requirements for either the Phase 2 mission or the DST system closure period.

2.0 APPROACH

Most of the performance requirements listed in this document are derived by an analysis of Appendix H in the *TWRS Operations and Utilization Plan* (TWRSO&UP, Kirkbride et al. 1997) as updated by the *Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary* (Swita 1998). Appendix H of the TWRSO&UP lists the transfers required to meet all of the DST system objectives during Phase 1. The list of transfers includes some historical information which was also used to quantify requirements. Additional detail explaining the derivation of each requirement is given in Section 3.0.

The operations described in the TWRSO&UP are constrained by requirements imposed by external agencies such as the U.S. Department of Energy (DOE) and the State of Washington. These constraints are listed in the *System Specification for the Double-Shell Tank System* (Grenard and Claghorn 1998). The configuration and the usage of the DSTs are based on the studies and decisions listed in Table 1.

Table 1. Basis for Double-Shell Tank Usage.

Title	Content
<i>Preliminary Low-Level Waste Feed Staging Plan</i> (Certa et al. 1996)	Evaluates options for the staging of LAW feed
<i>Decision Document, Low-Level Waste Feed Staging Strategy</i> (Daling 1996)	Documents the decision to use two double-shell tanks for intermediate waste feed staging and to turn over two tanks to the private contractors as feed tanks.
<i>Alternatives Generation and Analysis for the Phase 1 Intermediate Waste Feed Staging System Design Requirements</i> (Claghorn et al. 1996)	Evaluates options for the preparation and qualification of waste within the intermediate waste feed staging tanks
<i>Decision Document, Phase 1 Intermediate Waste Feed Staging System Design Requirements</i> (Galbraith and Daling 1997)	Documents the selection of a mixer concept for the intermediate waste feed staging tanks 241-AP-102 and 241-AP-104
<i>Alternatives Generation and Analysis for Waste Preparation Equipment - Phase 1 Source Tanks</i> (Claghorn et al. 1998)	Evaluates options for the preparation of waste from the source tanks for Phase 1 waste feed delivery
<i>Design Basis for Retrieval Equipment in Tanks AN-104 and AN-105</i> (Boston 1997)	Documents the selection of a mixer concept for 241-AN-104 and -105. This letter also outlined an operational concept for the retrieval of waste from these tanks.
<i>Decision Document, Waste Preparation Equipment for Phase 1 Source Tanks</i> (TBP)	TBP
<i>Decision Document for Phase 1 Privatization Transfer System Needs</i> (Galbraith et al. 1996)	Evaluates options and documents the selection of piping upgrades within tank farms

LAW = Low-activity waste

TBP = To be published.

3.0 PERFORMANCE REQUIREMENTS

Table 2 lists the performance requirements, the applicable paragraph of the *System Specification for the Double-Shell Tank System* (Grenard and Claghorn 1998), and additional detail on how the numbers were derived. The required transfer durations in this table are, in general, based on a reasonable minimum duration as estimated in the *Tank Waste Remediation System Retrieval and Disposal Mission Initial Updates Baseline Summary* (Swita 1998). The minimum duration is chosen as the requirement because the program strategy is to use the balance of the available time as contingency to correct unforeseen problems such as equipment failures. This strategy is intended to enhance the Waste Feed Delivery Program's chances of success.

Many of the requirements listed in Table 2 are subject to change in the event that the scenario for the conduct of Phase 1 is changed significantly.

Table 2. Double-Shell Tank System Performance Requirements. (7 Sheets)

Number	Paragraph Number	Requirement	Basis
1.	3.2.1.2.2.a	200 West Area Waste Batch Transfer. The system shall be capable of transferring batches of 0.1 ML (0.03 Mgal) to 4.39 ML (1.16 Mgal) of prepared waste to another 200 West Area DST in 4 to 9 days.	1) The first value is the smallest batch of waste transferred between West Area Tanks as shown in the TWRSO&UP transfer schedule. 2) The second number is the maximum volume of a DST 3) The third value is calculated by allowing 1 to 6 days of pump time: it takes about 6 days to pump 1.16 Mgal at 140 gal / min. Add 2 days setup time + 1 day shutdown. The setup and shutdown time are based on the Estimating Input Sheet for item number TBR150.B44 supporting the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998).
2.	3.2.1.2.5.a	200 East Area Waste Batch Transfer. The system shall be capable of transferring batches of 0.015 ML (0.004 Mgal) to 4.39 ML (1.16 Mgal) of prepared waste to another 200 East Area DST in 4 to 9 days.	Same as above except that these values were calculated for East Area tanks.
3.	3.2.1.2.3.a	Cross-site Waste Transfer Volume. The system shall be capable of transferring batches of 0.11 ML (0.03 Mgal) to 4.39 ML (1.16 Mgal) of prepared waste from West Area to a 200 East Area DST in 4 to 9 days.	Same as above except that these values were calculated for cross-site transfers.
4.	3.2.1.4.3.a	High-Level Waste Batch Sizes, Phase 1. The system shall prepare batches of HLW feed 0.18 ML (0.05 Mgal) to 1.1 ML (0.3 Mgal) in ≤ 108 to 214 days corresponding to 2 to 4 wash cycles respectively.	1) The batch volume is the bulk volume of solids in the HLW tank at the time that sludge washing begins. Table 4.3-3 from the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998) lists these numbers for each HLW tank under the "Available Feed" column. 2) Using the same table, the batch preparation time is the day that pretreatment starts and the day that it is ready for qualification.
5.	3.2.1.4.3.b	High-Level Waste Preparation Phase 1. The system shall qualify and mobilize a batch of solids for transfer in ≤ 316 days.	This requirement is taken directly from Table 3.2-4 of the TWRSO&UP. A total of 316 days is added to the wash durations to account for the time required to add transfer solutions and to qualify the batch. A reasonable minimum duration for waste preparation is defined by the <i>Life-Cycle Cost Analysis of Advanced Design Mixer Pump</i> (Hall 1996)
6.	3.2.1.5.4.a	High-Level Waste Batch Transfer Volume. The system shall be capable of transferring batches of HLW feed with a volume of 0.3 ML (0.07 Mgal) to 0.5 ML (0.14 Mgal) to the vendor within 1 day.	Table 4.3-3 of the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998) lists the feed volume delivered per batch. The "1 day" requirement is based on 0.53 m ³ /min (140 gal/min).

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Table 2. Double-Shell Tank System Performance Requirements. (7 Sheets)

Number	Paragraph Number	Requirement	Basis
7.	3.2.1.2.1.c	Insoluble Waste Preparation - West Area Tanks. The system shall have the capability to mobilize insoluble waste and transform it to satisfy the transfer requirements of HNF-SD-WM-DQO-001, Rev. 2 (Mulkey 1997) within 14 days.	The only DST in West Area with a significant quantity of insoluble waste is SY-102. A reasonable minimum duration for waste preparation is defined by the rationale for assumption 'C' in Section 4.1 of the <i>Life-Cycle Cost Analysis of Advanced Design Mixer Pump</i> (Hall 1996).
8.	3.2.1.3.4.c	Insoluble Waste Preparation - East Area Tanks. The system shall have the capability to mobilize insoluble waste and transform it to satisfy the transfer requirements of HNF-SD-WM-DQO-001, Rev. 2 (Mulkey 1997) in 1 day.	Table 3.2-4 of the TWRSO&UP shows that a minimum of 1 day is allocated to the transfer which includes the waste preparation time.
9.	3.2.1.2.7.a	Low-Activity Waste Staging Batch Volumes. The system shall be capable of transferring batches of 1.1 ML (0.3 Mgal) to 3.8 ML (1 Mgal) of prepared waste to the LAW staging tank within 4 to 9 days.	These values were calculated with the same procedure used to calculate the values for Item #1 above except that these values are based on projected transfers to the LAW staging tanks: AP-102 and AP-104.
10.	3.2.1.2.a	Low-Activity Waste Staging Quantity, Phase 1. The system shall be capable of transferring 10,500 MT of sodium to the LAW staging tanks through the end of Phase 1. The system shall transfer 2000 MT of sodium before the start of Phase 1 Plant operation, 7000 MT of sodium within five years after the start of Phase 1 plant operation and the balance within 9 years after the start of Phase 1 Plant operation.	These quantities were calculated from the information provided by Table 4.3-1 of the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998). These numbers were also checked by analysis of the TWRSO&UP. The analysis shows that approximately 97% of the soluble sodium prepared in an LAW source tank makes it way to the LAW staging tanks. Therefore, in rounded numbers, the total quantity of sodium delivered to the private contractors is approximately the quantity delivered to the staging tanks. Both AN-105 and AN-104 are staged prior to the start of LAW vitrification (scheduled for 6/2002). Tanks SY-101 and SY-103 are staged after five years of operation of the vitrification plant.
11.	3.2.1.3.1.a	Low-Activity Waste Staging Batch Size, Phase I. The system shall be capable of blending and qualifying batches of LAW feed with a volume of 1.04 ML (0.3 Mgal) to 4.4 ML (1.16 Mgal). The system shall blend and qualify each batch of LAW feed in \leq 113 days.	The minimum volume is based on information in Table 4.3-1 of the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998). The maximum volume is equal to the tank capacity. The duration is based on the Estimating Input Sheets that support the schedule given in the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998).

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Table 2. Double-Shell Tank System Performance Requirements. (7 Sheets)

Number	Paragraph Number	Requirement	Basis
12.	3.2.1.3.2.a	Low-Activity Waste Batches, Phase 1. The system shall be capable of delivering batches of envelope A, B, and C LAW feed with volume of 0.74 ML (0.2 Mgal) to 3.82 ML (1 Mgal) to each plant feed tank within 9 days.	Same as item 11 except that this is for waste transferred to 6AP and 8AP during Phase 1. 1) The minimum value corresponds to Batch #7 and 2) the maximum volume corresponds to Batch #11. 3) The 9 days is based on the reasoning given for requirement #1.
13.	3.2.1.4.2.a	Sludge Wash Supernatant Total Volume. The system shall be capable of transferring a maximum of 8.7 ML (2.3 Mgal) of wash supernate in five years.	Table 3.2-5 of the TWRSO&UP lists the volumes of wash supernatant transferred out of 1/2AZ and 2AY over 5 years (starting at the pretreatment start date). There aren't any transfers of supernatant after 6/2007 which is 5 years after plant startup.
14.	3.2.1.4.2.b	Sludge Wash Supernatant Batch Volume. The system shall be capable of transferring 0.25 ML (0.07 Mgal) to 1.4 ML (0.37 Mgal) of wash supernate containing negligible insoluble solids in \leq 4 days.	1) The first number is the minimum volume of wash supernatant transferred out of 1/2AZ and 2AY according to Table 3.2-5 of the TWRSO&UP. 2) This second number is based on the maximum volume from the same table. 3) The TWRSO&UP assumes that the quantity of solids entrained in the decant is insignificant.
15.	3.2.1.2.1.b	Soluble Waste Preparation - West Area. The system shall have the capability to transform sufficient soluble waste to achieve a supernatant sodium molarity of 7.0 in 82 days or to transform all of the soluble sodium into a solution that satisfies the transfer requirements of HNF-SD-WM-DQO-001, Rev. 2 (Mulkey 1997).	1): Table 3.1-8 of the TWRSO&UP lists the molarity of the retrieved waste as it would exist in the pipeline on its way to the intermediate waste feed staging tanks. 2) The time required to prepare waste is taken from supporting information for the schedule in the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998). This duration does not include the time required to degas or transfer.
16.	3.2.1.3.4.b	Soluble Waste Preparation - East Area. The system shall have the capability to transform sufficient soluble waste to achieve a supernatant sodium molarity of 6.5 to 9.0 in 117 days or to transform all the soluble waste into a solution that satisfies the transfer requirements of HNF-SD-WM-DQO-001, Rev. 2 (Mulkey 1997).	These values were derived using the same approach as item 15 except that this is for East Area LAW source tanks.
17.	3.2.1.2.b	Space Management Annual Waste Volume, Phase 1. The system shall be capable of moving 87 ML (23 Mgal) per year of waste through the end of Phase 1 for space management.	This is the sum the maximum yearly total transferred from 1) an East Area DST to another East Area DST (10 Mgal) 2) AW-102 to the evaporator (4 Mgal) 3) a West Area DST to West Area DST (5 Mgal) 4) a West Area DST to an East Area DST (4 Mgal) Note: The DST system does not move waste from the evaporator to the system.

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Table 2. Double-Shell Tank System Performance Requirements. (7 Sheets)

Number	Paragraph Number	Requirement	Basis
18.	3.2.1.2.1.a	Supernatant Preparation - West Area. The system shall have the capability to adjust up to 4.4 ML (1.16 Mgal) of supernatant to meet the in-line transfer requirements of HNF-SD-WM-DQO-001, Rev. 2 (Mulkey 1997) in line.	The volume stated is the maximum tank volume. The TWRSO&UP currently doesn't project this type of adjustment within a tank in West Area.
19.	3.2.1.2.4.a	Supernatant Preparation - East Area. The system shall have the capability to adjust up to 4.4 ML (1.16 Mgal) of supernatant to meet the in-line transfer requirements of HNF-SD-WM-DQO-001, Rev. 2 (Mulkey 1997).	Tanks AN-102, AN-106 and AN-107 are currently the only tanks where the target waste is a supernatant that will be adjusted in line during a transfer. The volume of waste in these three tanks is near the DST capacity which is 1.16 Mgal. The TWRSO&UP currently shows that the adjustment of this waste will occur in line.
20.	3.2.3.10.a	Water - Phase 1. The system shall obtain 49 ML (13 Mgal) of water from the Hanford Landlord System for distribution throughout the DST system.	This is the sum of all the water inputs over the duration of Phase 1 as listed in Appendix H of the TWRSO&UP.
21.	3.2.1.4.d	High-Level Waste Feed Frequency, Phase 1. The system shall be capable of delivering a batch of HLW feed to the vendor every 200 days.	This is the minimum interval of time between transfers of HLW to the private contractor as listed on Table 4.3-3 of the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998). More specifically, this is the minimum time required to process a batch of HLW (other than the very last batch).
22.	3.2.1.3.d	Low-Activity Waste Feed Frequency, Phase 1. The system shall be capable of mobilizing, staging, blending, qualifying and delivering a batch of LAW feed to the vendor in ≤ 182 days from sources where soluble salts must be dissolved and ≤ 125 days from sources consisting of supernatant.	This is the minimum duration of a feed delivery cycle as defined in the Input Estimating Sheets used to support the schedule in the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998). Batches 7 and 8 are qualified in Tank 241-AN-107 and therefore, not counted for this analysis. The time required to degas is not included in this requirement.
23.	3.2.1.1.8.a	Treatment Plant Waste Product Volume, Phase 1. The system shall be capable of receiving 0.5 ML/yr (0.13 Mgal/yr) of entrained solids and ^{90}Sr / transuranic (TRU) through the end of Phase 1.	This is the maximum projected yearly total of slurry (liquids and solids) returned from the private contractors.
24.	3.2.1.1.3.a	204-AR Annual Capacity. The system shall have the capacity to transfer at least 1.5 ML (0.4 Mgal) of waste per year through Phase 1.	

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Table 2. Double-Shell Tank System Performance Requirements. (7 Sheets)

Number	Paragraph Number	Requirement	Basis
25.	3.2.1.1.3.b	204-AR Batch Transfer. The system shall be capable of unloading batches of 18,900 L (5,000 gal) in ≤ 1 day.	This is the capacity of the railcar and the typical duration required to unload the car.
26.	3.2.1.1.6.a	Annual Volume of Concentrated Waste. The system shall have the capacity to receive up to 9.1 ML (2.4 Mgal) of waste per year through Phase 1.	This is the maximum quantity of waste received from the evaporator into 241-AW-106 on a yearly basis as listed in Appendix H of the TWRSO&UP.
27.	3.2.3.4.a	B Plant/Waste Encapsulation and Storage Facility Waste Volume. The system shall accept up to 0.2 ML (0.054 Mgal) of liquid waste per year from B Plant / WESF.	This is the sum the maximum quantity of waste received each year from B Plant and from WESF as listed in Appendix H of the TWRSO&UP.
28.	3.2.3.6.a	Concentrated Waste Received from the Evaporator. The system shall be capable of accepting 3.4 ML (0.9 Mgal) of waste in 8 days.	This is the maximum batch volume identified in Appendix H of the TWRSO&UP for transfers from the Evaporator to tank 241-AW-106.
29.	3.2.1.1.5.a	East Area Liquid Waste Annual Capacity. The system shall be capable of receiving up 15 ML (3.9 Mgal) of liquid waste per year through Phase 1.	This value is the sum of the maximum yearly quantity of waste received from each of the following facilities as listed in Appendix H of the TWRSO&UP: 1) 100 Area basins 2) Plutonium-Uranium Extraction Plant 3) WESF and B Plant 4) 300 Area 5) Salt well pumping 6) SST Retrieval
30.	3.2.3.5.b	East Single-Shell Tank Salt Well Liquid Waste Volume. The system shall accept 0.8 ML (0.2 Mgal) of dilute, non-complexed (DN) and 3.4 ML (0.9 Mgal) of dilute, complexed (DC) liquid from salt well pumping from the SSTs over 4 years.	These values are derived from the transfer schedule listed in Appendix H of the TWRSO&UP.
31.	3.2.1.2.6.a	Evaporator Feed Annual Volume. The system shall be capable of providing up to 17 ML/yr (4.4 Mgal/yr) of dilute supernate from Tank 241-AW-102 for concentration.	These values are derived from the transfer schedule listed in Appendix H of the TWRSO&UP. In this case, the value is the maximum quantity provided in one year.

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Table 2. Double-Shell Tank System Performance Requirements. (7 Sheets)

Number	Paragraph Number	Requirement	Basis
32.	3.2.1.2.6.b	Evaporator Feed Batch Size. The maximum evaporator batch size to be transferred to the evaporator by the system (i.e., campaign) is 5.7 ML (1.5 Mgal).	These values are derived from the transfer schedule listed in Appendix H of the TWRSO&UP.
33.	3.2.1.2.c	Evaporator Feed Volume, Phase 1. The system shall be capable of delivering up to 17 ML (4.4 Mgal) of waste per year for transfer to the evaporator through the end of Phase 1.	These are the same values as item #31.
34.	3.2.1.1.4.b	Waste Batch Size - West Area. The system shall be capable of receiving batches of 0.004 ML (0.001 Mgal) to 2.7 ML (0.72 Mgal) in ≤ 9 days.	This volumetric information is based on the minimum and the maximum batch sizes listed in Appendix H of the TWRSO&UP for transfers from the following facilities: 1) 222-S Laboratory 2) SST Retrieval 3) T-Plant 4) Plutonium Finishing Plant 5) Salt well pumping The duration is based on the maximum number of days required to pump the waste plus 2 days setup time and one day for shutdown operations. The setup and shutdown time are based on the Estimating Input Sheets supporting the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998).
35.	3.2.1.1.5.b	Liquid Waste Batch Size - East Area. The system shall be capable of receiving batches of 0.02 ML (0.005 Mgal) to 3 ML (0.8 Mgal) in ≤ 9 days.	This volumetric information is based on the minimum and the maximum batch sizes listed in Appendix H of the TWRSO&UP for transfers from the following facilities: 1) 100 Area basins 2) Plutonium-Uranium Extraction Plant 3) WESF and B Plant 4) 300 Area 5) Salt well pumping The duration is based on the maximum number of days required to pump the waste plus 2 days setup time and one day for shutdown operations. The setup and shutdown time are based on the Estimating Input Sheets supporting the <i>Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary</i> (Swita 1998).
36.	3.2.3.2.a	Plutonium Finishing Plant Waste Annual Volume. The system shall accept up to 30,000 L (8,000 gal) of liquid waste per year from the PFP.	This is the maximum projected annual volume from the PFP as described in Appendix H of the TWRSO&UP.

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Table 2. Double-Shell Tank System Performance Requirements. (7 Sheets)

Number	Paragraph Number	Requirement	Basis
37.	3.2.3.3.a	S Plant Waste Volume. The system shall accept up to 235,000 L (62,000 gal) of liquid waste per year from S Plant.	This is the maximum projected annual volume from S Plant (222-S) as described in Appendix H of the TWRSO&UP.
38.	3.2.3.5.d	Single-Shell Tank Waste Retrieval Volume, Phase 1. Beginning in FY 2003, the system shall be capable of accepting 30 ML (7.8 Mgal) of SST waste through the end of Phase 1.	This is the total projected volume from SST retrieval as described in Appendix H of the TWRSO&UP.
39.	3.2.1.1.4.a	West Area Liquid Waste Annual Capacity. The system shall be capable of receiving at least 15 ML (4.0 Mgal) of liquid waste per year through Phase 1.	This value is the sum of the maximum yearly quantity of waste transferred from each of the following facilities as listed in Appendix H of the TWRSO&UP: 1) 222-S Laboratory 2) SST Retrieval 3) T-Plant 4) Plutonium Finishing Plant 5) Salt well pumping The 9 year value is the duration of Phase 1.
40.	3.2.3.5.a	West Single-Shell Tank Salt Well Liquid Waste Volume. The DST system shall be capable of accepting 9.5 ML (2.5 Mgal) of dilute, non-complexed (DN) and 3.4 ML (0.9 Mgal) of dilute, complexed (DC) liquid from salt well pumping from the SSTs over 4 years.	These values are derived from the transfer schedule listed in Appendix H of the TWRSO&UP.

DST = Double-shell tank
 HLW = High-level waste
 LAW = Low-activity waste
 SST = Single-shell tank
 TBD = To be determined
 TWRSO&UP = Tank Waste Remediation System Operation and Utilization Plan.

4.0 REFERENCES

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APPENDIX A

CALCULATION SHEETS

Performed by:  FEB 6 1998
R. S. Wittman Date

Checked by:  Feb 6, 1998
R. D. Claghorn Date

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APPENDIX A

CALCULATION SHEETS

This appendix provides the raw data and the example calculations necessary to derive the performance requirements listed in the main body of this document. Sections A.1, A.2 and A.3 provide general information. Section A.4 is oriented to specific requirements.

A.1 EXPLANATION OF TWRSO&UP TRANSFER TABLE

Table A-1 is taken from the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997). It was generated using a computer program called the Hanford Tank Waste Operations Simulator (HTWOS). The HTWOS program was verified and validated by the *Verification and Validation of the Tank Waste Remediation System Hanford Tank Waste Operations Simulator* (Wittman 1997).

Table A-2 is a legend for the "from" and "to" information in Table A-1. Other information required to read Table A-1 is given below.

A.1.1 Generic Transfers

Most of the transfers in the table are simple tank to tank or waste source to tank transfers, but some are more complicated. The more elaborate transfers are described separately below. In any event, all transfers consist of the tank pumped from, the tank pumped to, the start date of the transfer, the end date of the transfer, the liquid volume transferred, and the solids volume transferred on a dry solids basis. The very small amount of solids transferred for some transfers is due to the assumption that a small fraction of the solids in a tank will be entrained in the liquid.

A.1.2 Evaporator Runs

Evaporator runs consist of three lines in the transfer table. The first line gives the transfer from the evaporator feed tank (AW-102) to 242-A, the second line gives the transfer from 242-A to the evaporator bottoms catch tank (AW-106), and the third line gives the transfer from 242-A to the condensate catch tank (defined as LERF in the model).

A.1.3 In-Line Dilution Transfers

For some of the transfers in support of the LAW feed staging plan, DST contents will be retrieved and transferred using in-line dilution. In-line dilution consists of pumping (and mixing if desired) the DST contents as they exist and adding dilution/transfer water in the line. No water is added directly to the tank. Also if any dissolution/precipitation reactions are to occur they will occur in the line. Therefore, in order to be accurate, this transfer needed to be described in three steps: what is removed from the source tank, the amount of water added, and what is added to the destination tank.

The in-line dilution transfers can be found in the transfer table by examining the "To" column to find an entry that is "name of a DST"-PUMP. This entry is for the addition of the dilution water. The entry before this one gives the transfer out of the source tank and the entry after gives the transfer to the destination tank. For the some of the transfers one can see that the solids transferred out of the source tank do not equal the solids transferred into the destination tank. This is due to the dissolution/precipitation reactions that occur in-line.

Table A-1. Projected Transfers Through October 2011. (26 sheets)

Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			EVAPF	AW-102	12/5/93	12/5/93	28,000	0	
			ZNL87	SY-102	4/4/94	4/4/94	4,000	0	
			ZNL87	SY-102	4/4/94	4/4/94	3,000	0	
			WNW88	SY-102	4/19/94	4/19/94	27,000	0	
			AW-106	AW-102	4/15/94	4/19/94	870,300	31	
			AW-102	242-A	4/25/94	5/11/94	1,826,000	64	
			242-A	AW-106	4/25/94	5/11/94	1,223,000	64	
			242-A	LERF	4/25/94	5/11/94	603,000	0	
			AW-106	AW-102	5/15/94	5/21/94	1,222,000	44	
			AP-103	AW-102	5/19/94	5/25/94	1,092,000	37	
			AW-106	AW-102	6/5/94	6/8/94	680,000	56	
			AW-102	242-A	5/25/94	6/15/94	2,366,000	83	
			242-A	AW-106	5/25/94	6/15/94	968,800	83	
			242-A	LERF	5/25/94	6/15/94	1,397,000	0	
			WATER	AW-102	6/16/94	6/16/94	28,000	0	
			AW-102	242-A	6/15/94	6/21/94	656,500	23	
			242-A	AW-106	6/15/94	6/21/94	379,900	23	
			242-A	LERF	6/15/94	6/21/94	276,600	0	
			AW-106	AW-102	6/25/94	6/25/94	52,998	2	
			AP-101	AW-102	8/11/94	8/15/94	744,000	0	
			EVAPF	AW-102	8/25/94	8/25/94	46,000	0	
			AP-107	AW-102	9/10/94	9/15/94	900,000	0	
			AW-106	AN-106	9/19/94	9/21/94	400,000	17	
			AW-102	242-A	9/15/94	9/30/94	1,772,000	61	
			242-A	AW-106	9/15/94	9/30/94	1,240,000	61	
			242-A	LERF	9/15/94	9/30/94	532,000	0	
			AP-107	AW-102	10/1/94	10/1/94	157,300	0	
			AW-106	AW-102	9/30/94	10/4/94	739,400	34	
			AW-106	AW-102	10/5/94	10/6/94	213,000	10	
			AP-108	AP-101	10/7/94	10/8/94	284,000	0	
			AP-101	AW-102	10/8/94	10/10/94	451,000	0	
			AP-108	AW-102	10/15/94	10/19/94	814,400	0	
			AW-103	AP-107	10/19/94	10/19/94	130,600	5	
			AW-102	242-A	10/25/94	11/4/94	2,347,000	81	
			242-A	AW-106	10/25/94	11/4/94	859,900	81	
			242-A	LERF	10/25/94	11/4/94	1,487,000	0	
			AW-106	AW-102	11/15/94	11/21/94	1,275,000	46	
			AW-105	AP-108	11/25/94	11/27/94	480,000	17	
			WATER	AW-102	11/30/94	11/30/94	35,000	0	
			AW-106	AW-102	11/30/94	11/30/94	50,996	4	
			AW-105	AP-108	12/1/94	12/1/94	170,700	6	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			AW-102	242-A	11/25/94	12/6/94	1,275,000	46	
			242-A	AW-106	11/25/94	12/6/94	501,700	46	
			242-A	LERF	11/25/94	12/6/94	773,300	0	
			AP-108	AP-101	1/20/95	1/23/95	650,700	21	
			AP-101	AP-107	1/22/95	1/25/95	774,600	19	
			WATER	SY-102	2/22/95	2/22/95	8,000	0	
			SPN87	SY-102	2/22/95	2/22/95	22,000	0	
			AP-106	AW-102	3/28/95	3/28/95	83,000	0	
			EVAPF	AW-102	4/1/95	4/1/95	52,000	0	
			EVAPF	SY-102	4/7/95	4/7/95	15,000	0	
			AP-106	AP-108	5/4/95	5/8/95	934,000	0	
			AP-107	AW-102	5/19/95	5/20/95	371,000	9	
			AP-108	AW-102	5/23/95	5/24/95	372,000	0	
			WATER	AW-102	6/1/95	6/1/95	13,000	0	
			AW-106	AW-102	6/5/95	6/7/95	443,000	17	
			AP-107	AW-102	6/12/95	6/14/95	534,200	13	
			AP-108	AW-102	6/13/95	6/15/95	559,000	1	
			AW-102	242-A	6/15/95	6/26/95	2,513,000	14	
			242-A	AW-106	6/15/95	6/26/95	1,180,000	14	
			242-A	LERF	6/15/95	6/26/95	1,333,000	0	
			AW-106	AW-102	6/30/95	7/2/95	424,000	16	
			AW-106	AW-102	7/5/95	7/8/95	764,000	28	
			AW-102	242-A	7/15/95	7/20/95	1,188,000	44	
			242-A	AW-106	7/15/95	7/20/95	367,500	44	
			242-A	LERF	7/15/95	7/20/95	820,400	0	
			AW-106	AW-102	7/30/95	7/30/95	33,999	1	
			SY-102		8/2/95	8/4/95	430,000	15	Out-of-system Volume Reconciliation
			WNW88	SY-102	8/12/95	8/13/95	12,000	0	
			WATER	SY-102	8/14/95	8/14/95	6,000	0	
			AP-105	AP-101	8/27/95	8/30/95	660,000	29	
			PXTCO	AW-105	11/7/95	11/8/95	334,000	0	
			WATER	AW-105	11/9/95	11/9/95	19,000	0	
			AW-105		11/13/95	11/14/95	330,000	11	Out-of-system Volume Reconciliation
			BPTCO	AP-106	2/8/96	2/8/96	14,000	0	
			WATER	AP-106	2/16/96	2/16/96	3,000	0	
			34L87	AP-106	2/16/96	2/16/96	28,000	0	
			EVAPF	AW-102	3/1/96	3/1/96	67,000	0	
			AW-106	AP-101	3/4/96	3/5/96	306,000	13	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			UNKN	AP-106	3/18/96	3/18/96	0	0	
			WATER	AP-106	3/18/96	3/18/96	28,000	0	
			BPTCO	AP-106	3/20/96	3/20/96	26,000	0	
			EVAPF	AW-106	4/1/96	4/1/96	14,000	0	
			EVAPF	AW-102	4/1/96	4/1/96	22,000	0	
			WNE88	SY-102	3/20/96	4/12/96	169,000	0	
			WATER	SY-102	4/13/96	4/13/96	49,000	0	
			SPN87	AP-106	4/17/96	4/17/96	11,000	0	
			SPN87	AP-106	4/17/96	4/17/96	11,000	0	
			WATER	AP-108	4/19/96	4/19/96	3,000	0	
			BPTCO	AP-108	4/19/96	4/19/96	14,000	0	
			AW-106	AW-102	5/6/96	5/6/96	28,999	1	
			AP-104	AW-102	5/6/96	5/10/96	812,000	0	
			AW-102	242-A	5/15/96	5/19/96	964,300	33	
			242-A	AW-106	5/15/96	5/19/96	124,600	33	
			242-A	LERF	5/15/96	5/19/96	839,700	0	
			EVAPF	AW-102	5/30/96	5/30/96	3,000	0	
			AW-106	AW-102	5/30/96	5/30/96	61,997	3	
			TAL88	AP-106	6/6/96	6/6/96	10,000	0	
			PXTCO	AW-105	6/30/96	6/30/96	95,000	0	
			WATER	AP-105	7/1/96	7/1/96	1,000	0	
			WATER	AY-102	8/15/96	8/15/96	27,000	0	
			AN-101	AP-105	8/16/96	8/20/96	928,800	0	
			AW-106	AP-101	1/9/97	1/9/97	69,511	3	
			AN-106	AP-108	1/16/97	1/16/97	177,000	7	
			AP-105	AW-102	2/10/97	2/14/97	942,000	42	
			AW-102	242-A	2/26/97	3/2/97	977,500	43	
			242-A	AW-106	2/26/97	3/2/97	576,400	43	
			242-A	LERF	2/26/97	3/2/97	401,100	0	
			AY-101	AP-108	3/3/97	3/7/97	809,000	30	
			AW-106	AP-105	4/3/97	4/5/97	576,200	29	
			AN-106	AP-108	7/1/97	7/7/97	194,000	7	
			AP-108	AW-102	7/3/97	7/10/97	1,198,000	43	
			AW-102	242-A	7/5/97	7/10/97	1,198,000	40	
			242-A	AW-106	7/5/97	7/10/97	346,700	40	
			242-A	LERF	7/5/97	7/10/97	851,300	0	
			ZNL87	SY-102	7/31/97	7/31/97	2,000	0	
			WATER	SY-102	7/31/97	7/31/97	62,000	0	
			WNW88	SY-102	7/31/97	8/1/97	223,000	0	
			AW-106	AN-106	8/5/97	8/6/97	346,400	16	
			SY-102	AP-107	8/15/97	8/17/97	520,000	20	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			WASH-CAUSTIC	AN-107	10/2/97	10/2/97	66,000	0	
			AY-102	AP-106	10/7/97	10/7/97	35,999	1	
			WATER	AY-102	10/8/97	10/8/97	176,000	0	
			ZNL87	SY-102	11/30/97	11/30/97	4,000	0	
			SPN87	SY-102	11/30/97	11/30/97	7,000	0	
			WATER	SY-102	11/30/97	11/30/97	112,000	0	
			WNW88	SY-102	11/30/97	12/2/97	422,000	0	
			TNS88	AP-106	12/5/97	12/5/97	1,500	500	
			PXTCO	AP-106	12/5/97	12/5/97	10,000	0	
			TAL88	AP-106	12/5/97	12/5/97	20,000	0	
			WESF	AP-106	12/5/97	12/5/97	25,000	0	
			SPN87	AP-106	12/5/97	12/5/97	25,000	0	
			34L87	AP-106	12/5/97	12/5/97	67,000	0	
			WATER	AP-106	12/5/97	12/5/97	109,000	0	
			BPTCO	AP-106	12/5/97	12/5/97	136,000	0	
			EVAPF	AP-106	12/5/97	12/5/97	150,000	0	
			WNE88	AP-106	12/5/97	12/6/97	204,000	0	
			SY-102	AP-107	12/15/97	12/17/97	520,000	21	
			AP-106	AP-104	12/20/97	12/25/97	996,800	35	
			SPN87	SY-102	2/28/98	2/28/98	6,000	0	
			WATER	SY-102	2/28/98	2/28/98	103,000	0	
			WNW88	SY-102	2/28/98	3/2/98	410,000	0	
			AP-104	AW-102	3/1/98	3/6/98	995,300	34	
			SY-102	AP-104	3/15/98	3/17/98	520,000	21	
			AW-102	242-A	4/5/98	4/9/98	995,300	35	
			242-A	AW-106	4/5/98	4/9/98	168,500	35	
			242-A	LERF	4/5/98	4/9/98	826,800	0	
			WATER	AP-107	4/10/98	4/10/98	70,000	0	
			AP-107	AW-102	4/25/98	5/7/98	1,104,000	40	
			AW-102	242-A	5/5/98	5/10/98	1,104,000	39	
			242-A	AW-106	5/5/98	5/10/98	441,000	39	
			242-A	LERF	5/5/98	5/10/98	663,000	0	
			SPN87	SY-102	5/31/98	5/31/98	6,000	0	
			WCW88	SY-102	5/31/98	5/31/98	38,000	0	
			WATER	SY-102	5/31/98	5/31/98	119,000	0	
			WNW88	SY-102	5/31/98	6/2/98	435,000	0	
			AW-106	AP-105	6/3/98	6/4/98	341,000	16	
			SY-102	AP-104	6/15/98	6/17/98	520,000	21	

Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
	Y		AY-102	C-106	7/1/98	7/5/98	920,700	31	Sluice "Water" for C-106 Retrieval - Lumped (See 7/15/98)
			AP-101	AW-103	8/6/98	8/9/98	625,000	27	
			SPN87	SY-102	8/31/98	8/31/98	6,000	0	
			WCW88	SY-102	8/31/98	8/31/98	34,000	0	
			WATER	SY-102	8/31/98	8/31/98	104,000	0	
			WNNW88	SY-102	8/31/98	9/1/98	385,000	0	
			SY-102	AP-107	9/15/98	9/17/98	520,000	21	
			WATER	AP-104	9/18/98	9/18/98	70,000	0	
			AW-104	AP-107	10/10/98	10/12/98	540,000	18	
			EVAPF	AW-102	10/13/98	10/14/98	195,000	0	
			AW-104	AP-104	10/14/98	10/14/98	164,000	6	
			AP-101	AW-104	10/21/98	10/23/98	460,000	20	
			AW-106	AP-101	10/27/98	10/28/98	289,000	13	
			AW-102	AW-106	10/28/98	10/28/98	150,000	6	
			AW-106	AW-102	11/6/98	11/6/98	150,000	6	
			AP-104	AW-102	10/3/98	11/10/98	1,110,000	42	
			AW-102	242-A	11/5/98	11/10/98	1,195,000	46	
			242-A	AW-106	11/5/98	11/10/98	585,000	46	
			242-A	LERF	11/5/98	11/10/98	610,000	0	
	Y		C-106	AY-102	7/15/98	11/26/98	923,500	17,315	C-106 Retrieval (Project W-320)
			WCW88	SY-102	11/30/98	11/30/98	14,000	0	
			SPN87	SY-102	11/30/98	11/30/98	7,000	0	
			ZNL87	SY-102	11/30/98	11/30/98	4,000	0	
			WATER	SY-102	11/30/98	11/30/98	98,000	0	
			WNNW88	SY-102	11/30/98	12/1/98	357,000	0	
			AW-106	AP-101	12/1/98	12/3/98	563,900	25	
			SY-102	AP-104	12/15/98	12/17/98	520,000	21	
			PXTCO	AP-106	12/31/98	12/31/98	5,000	0	
			TNS88	AP-106	12/31/98	12/31/98	750	250	
			WESF	AP-106	12/31/98	12/31/98	5,000	0	
			TAL88	AP-106	12/31/98	12/31/98	20,000	0	
			BPTCO	AP-106	12/31/98	12/31/98	44,000	0	
			34L87	AP-106	12/31/98	12/31/98	60,000	0	
			WATER	AP-106	12/31/98	12/31/98	76,000	0	
			EVAPF	AP-106	12/31/98	12/31/98	130,000	0	
			WNE88	AP-106	12/31/98	1/1/99	186,000	0	
			AP-106	AP-104	1/15/99	1/16/99	385,000	14	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			WATER	AP-107	1/31/99	1/31/99	35,000	0	
			WATER	AN-101	2/15/99	2/16/99	194,000	0	
			WCE88	AN-101	2/15/99	2/18/99	775,000	0	
			SPN87	SY-102	2/28/99	2/28/99	6,000	0	
			WATER	SY-102	2/28/99	2/28/99	103,000	0	
			WCW88	SY-102	2/28/99	2/28/99	135,000	0	
			WNV88	SY-102	2/28/99	3/1/99	275,000	0	
			AN-101	AP-103	3/2/99	3/7/99	1,024,000	0	
			AP-107	AW-102	2/15/99	3/9/99	1,095,000	40	
			AW-102	242-A	3/5/99	3/10/99	1,130,000	36	
			242-A	AW-106	3/5/99	3/10/99	360,900	36	
			242-A	LERF	3/5/99	3/10/99	769,000	0	
			SY-102	AP-107	3/15/99	3/17/99	520,000	21	
			AW-106	AP-101	4/3/99	4/4/99	224,000	10	
			AW-106	AW-104	4/5/99	4/5/99	136,800	6	
			SPN87	SY-102	5/31/99	5/31/99	6,000	0	
			WATER	SY-102	5/31/99	5/31/99	107,000	0	
			WNV88	SY-102	5/31/99	5/31/99	180,000	0	
			WCW88	SY-102	5/31/99	6/1/99	249,000	0	
			SY-102	AP-107	6/15/99	6/17/99	520,000	22	
			AP-103	AW-102	7/1/99	7/8/99	1,017,000	44	
			AW-102	242-A	7/5/99	7/9/99	979,200	36	
			242-A	AW-106	7/5/99	7/9/99	891,000	36	
			242-A	LERF	7/5/99	7/9/99	88,202	0	
			AW-106	AN-106	7/20/99	7/23/99	748,000	33	
			AW-106	AP-108	7/25/99	7/25/99	143,000	6	
			WATER	AP-104	8/26/99	8/26/99	35,000	0	
			SPN87	SY-102	8/31/99	8/31/99	6,000	0	
			WATER	SY-102	8/31/99	8/31/99	98,000	0	
			WCW88	SY-102	8/31/99	9/1/99	188,000	0	
			WNV88	SY-102	8/31/99	9/1/99	206,000	0	
			EVAPF	AW-102	9/7/99	9/7/99	70,000	0	
			AW-102	AW-106	9/22/99	9/23/99	300,000	12	
			SY-102	AP-104	9/15/99	9/27/99	520,000	22	
Y		Y	AP-104	AW-102	9/10/99	9/29/99	1,104,000	41	Empty 4AP
			AW-106	AW-102	10/6/99	10/7/99	300,000	13	
Y		Y	AP-102	AP-103	10/3/99	10/8/99	1,070,000	0	Empty 2AP
			AW-102	242-A	10/5/99	10/10/99	1,139,000	45	
			242-A	AW-106	10/5/99	10/10/99	432,200	45	
			242-A	LERF	10/5/99	10/10/99	706,800	0	
			AW-106	AW-104	10/12/99	10/12/99	111,000	5	

Table A-1. Projected Transfers Through October 2011. (26 sheets)

Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			AW-106	AN-101	10/13/99	10/14/99	321,000	16	
			WATER	AP-107	10/17/99	10/17/99	70,000	0	
			AP-107	AW-102	11/1/99	11/8/99	1,110,000	43	
			AW-102	242-A	11/5/99	11/10/99	1,110,000	34	
			242-A	AW-106	11/5/99	11/10/99	732,200	34	
			242-A	LERF	11/5/99	11/10/99	377,700	0	
			AW-106	AN-101	12/12/99	12/15/99	732,200	33	
			SPN87	SY-102	12/31/99	12/31/99	13,000	0	
			ZNL87	SY-102	12/31/99	12/31/99	4,000	0	
			WATER	SY-102	12/31/99	12/31/99	92,000	0	
			WCW88	SY-102	12/31/99	12/31/99	147,000	0	
			WNW88	SY-102	12/31/99	1/1/00	192,000	0	
			SY-102	AP-104	1/15/00	1/17/00	520,000	22	
			WATER	AP-104	6/17/00	6/17/00	70,000	0	
			AP-104	AW-102	7/2/00	7/8/00	1,110,000	43	
			AW-102	242-A	7/6/00	7/11/00	1,145,000	36	
			242-A	AW-106	7/6/00	7/11/00	778,300	36	
			242-A	LERF	7/6/00	7/11/00	366,700	0	
			WATER	AP-108	8/17/00	8/17/00	35,000	0	
			WCE88	AP-108	8/17/00	8/18/00	141,000	0	
Y	Y	Y	AZ-101	AY-101	8/18/00	8/21/00	685,000	0	Pre-stage Envelope B/Initial Decant Envelope D
	Y		WASH-WATER	AZ-101	8/21/00	8/22/00	146,000	0	First Wash 1AZ
			TNS88	AP-106	9/17/00	9/17/00	1,500	500	
			WESF	AP-106	9/17/00	9/17/00	10,000	0	
			PXTCO	AP-106	9/17/00	9/17/00	10,000	0	
			WATER	AP-106	9/17/00	9/17/00	40,000	0	
			TAL88	AP-106	9/17/00	9/17/00	54,000	0	
			INS96	AW-105	9/18/00	9/18/00	15,002	4,998	
			34L87	AP-106	9/17/00	9/18/00	137,000	0	
			AW-106	AP-107	9/14/00	9/18/00	778,200	34	
			WATER	AW-105	9/18/00	9/18/00	174,000	0	
			WATER	AP-106	9/18/00	9/19/00	30,000	0	
			EVAPF	AP-106	9/17/00	9/19/00	320,000	0	
			1FL96	AW-105	9/18/00	9/19/00	53,000	0	
			1KL96	AW-105	9/18/00	9/19/00	332,000	0	
Y		Y	WASH-WATER	AP-104	10/1/00	10/2/00	200,000	0	Flush 4AP
Y		Y	AP-106	AW-102	10/2/00	10/4/00	474,000	16	Empty 6AP

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Table A-1. Projected Transfers Through October 2011. (26 sheets)

Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
Y		Y	AP-106	AW-102	10/5/00	10/5/00	71,998	2	Empty 6AP
Y		Y	AP-106	AW-102	10/6/00	10/6/00	130,000	4	Empty 6AP
Y		Y	AP-106	AW-102	10/7/00	10/7/00	60,191	2	Empty 6AP
			AW-105	AW-102	10/6/00	10/8/00	414,000	14	
Y		Y	AP-106	AW-102	10/8/00	10/8/00	0	0	Empty 6AP
			AW-105	AW-102	10/9/00	10/10/00	213,100	7	
	Y		AZ-101	AW-105	10/10/00	10/10/00	142,500	0	First Wash Decant 1AZ
			AW-102	242-A	10/5/00	10/12/00	1,476,000	52	
			242-A	AW-106	10/5/00	10/12/00	87,361	52	
			242-A	LERF	10/5/00	10/12/00	1,389,000	0	
	Y		WASH-WATER	AZ-101	10/11/00	10/12/00	146,000	0	Second Wash 1AZ
		Y	AP-104	AP-102	10/15/00	10/16/00	200,000	1	Flush 2AP
			AW-106	AP-107	11/3/00	11/3/00	86,999	5	
	Y		AZ-101	AW-105	11/30/00	12/1/00	140,200	0	Second Wash Decant 1AZ
	Y		WASH-WATER	AZ-101	12/2/00	12/3/00	146,000	0	Third Wash 1AZ
	Y		AZ-101	AW-105	1/21/01	1/21/01	142,900	0	Third Wash Decant 1AZ
	Y		WASH-WATER	AZ-101	1/22/01	1/23/01	140,200	0	Transfer Water Add 1AZ
			AP-106	AW-102	2/7/01	2/7/01	0	0	
Y		Y	AP-102	AP-106	2/15/01	2/16/01	200,000	1	Flush 6AP
			ZNL87	SY-102	3/20/01	3/20/01	4,000	0	
			WCW88	SY-102	3/20/01	3/20/01	45,000	0	
			SPN87	SY-102	3/20/01	3/20/01	37,000	0	
			WATER	SY-102	3/20/01	3/20/01	37,000	0	
			WNW88	SY-102	3/20/01	3/20/01	83,000	0	
		Y	AN-105	AP-102	3/17/01	3/20/01	542,400	7,895	Retrieve/Stage LAW Batch 1, Contractor 1, Envelope A
		Y	LERF	AN-105-PUMP	3/17/01	3/20/01	154,100	0	Dilution Water
		Y	AN-105	AP-102	3/17/01	3/20/01	686,500	294	As-received Ghost
		Y	AN-105	AP-104	3/21/01	3/24/01	542,400	7,895	Retrieve/Stage LAW Batch 1, Contractor 2, Envelope A
		Y	LERF	AN-105-PUMP	3/21/01	3/24/01	154,100	0	Dilution Water
		Y	AN-105	AP-104	3/21/01	3/24/01	686,500	294	As-received Ghost

Table A-1. Projected Transfers Through October 2011. (26 sheets)

Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997).

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
Y		Y	AP-108	AN-105	3/25/01	3/26/01	319,500	7	Empty 8 AP
Y		Y	AP-106	AP-108	3/27/01	3/27/01	213,500	1,043	Flush 8AP
Y		Y	AP-108	AN-105	3/28/01	3/28/01	213,600	925	Empty 8AP
			SY-102	AW-102	4/4/01	4/5/01	384,000	16	
			SY-102	AW-102	4/6/01	4/6/01	10,000	0	
			AW-102	242-A	6/1/01	6/3/01	394,000	16	
			242-A	AW-106	6/1/01	6/3/01	211,900	16	
			242-A	LERF	6/1/01	6/3/01	182,100	0	
			AN-105	AW-102	6/10/01	6/12/01	520,100	21	
		Y	AP-102	AP-106	7/10/01	7/13/01	686,500	282	Deliver LAW Batch 1, Contractor 1
		Y	AP-104	AP-108	7/14/01	7/17/01	686,500	282	Deliver LAW Batch 1, Contractor 2
			WATER	AN-105	9/17/01	9/17/01	35,000	0	
			ZNL87	SY-102	10/2/01	10/2/01	4,000	0	
			WATER	SY-102	10/2/01	10/2/01	5,000	0	
			SPN87	SY-102	10/2/01	10/2/01	25,000	0	
		Y	AN-104	AP-102	10/1/01	10/4/01	502,200	12,513	Retrieve/Stage LAW Batch 2, Contractor 1, Envelope A
		Y	LERF	AN-104-PUMP	10/1/01	10/4/01	200,800	0	Dilution Water
		Y	AN-104	AP-102	10/1/01	10/4/01	684,700	702	As-received Ghost
		Y	AN-104	AP-104	10/5/01	10/8/01	502,200	12,513	Retrieve/Stage LAW Batch 2, Contractor 2, Envelope A
		Y	LERF	AN-104-PUMP	10/5/01	10/8/01	200,800	0	Dilution Water
		Y	AN-104	AP-104	10/5/01	10/8/01	684,700	702	As-received Ghost
			WATER	AW-102	10/19/01	10/19/01	35,000	0	
			EVAPF	AW-102	10/19/01	10/20/01	225,000	0	
			AW-102	242-A	12/1/01	12/4/01	780,100	30	
			242-A	AW-106	12/1/01	12/4/01	282,600	30	
			242-A	LERF	12/1/01	12/4/01	497,500	0	
			AN-105	AW-102	12/10/01	12/10/01	35,011	1	
		Y	AP-107	AN-104	1/1/02	1/4/02	865,700	39	Empty 7AP for Vendor Returns (Sr/TRU/Entrained Solids)

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
Y	Y	Y	AZ-102	AY-101	1/11/02	1/12/02	204,000	0	Pre-stage Envelope B (Blending Stock)/Initial Decant Envelope D
Y	Y		AZ-102	AN-104	1/12/02	1/13/02	181,800	0	Complete Initial Decant Envelope D
	Y		WASH-WATER	AZ-102	1/13/02	1/14/02	213,000	0	First Wash 2AZ
	Y		AZ-102	AN-105	3/4/02	3/5/02	72,225	0	First Decant 2AZ
	Y		WASH-WATER	AZ-102	3/6/02	3/7/02	213,000	0	Second Wash 2AZ
			SY-102	AW-102	4/4/02	4/4/02	29,999	1	
			SY-102	AW-102	4/4/02	4/4/02	4,000	0	
	Y		AZ-102	AN-105	4/25/02	4/26/02	208,800	0	Second Wash Decant 2AZ
	Y		WASH-WATER	AZ-102	4/27/02	4/28/02	213,000	0	Third Wash 2AZ
	Y		AZ-101	PIHLW F BED TAN K	5/17/02	5/17/02	136,000	5,135	Deliver Batch 1 of 1AZ, Envelope D (Batch 1 Overall)
			AW-102	242-A	6/1/02	6/1/02	69,010	3	
			242-A	AW-106	6/1/02	6/1/02	21,399	3	
			242-A	LERF	6/1/02	6/1/02	47,611	0	
			AN-105	AW-102	6/10/02	6/11/02	281,100	10	
	Y		AZ-102	AN-105	6/16/02	6/17/02	210,700	0	Third Wash Decant 2AZ
	Y		WASH-WATER	AZ-102	6/18/02	6/19/02	213,000	0	Fourth Wash 2AZ
	Y		AZ-102	AN-105	8/7/02	8/8/02	211,700	0	Fourth Wash Decant 2AZ
	Y		WASH-WATER	AZ-102	8/9/02	8/10/02	209,700	0	Transfer Water Add 2AZ
			WESF	AN-105	9/17/02	9/17/02	5,000	0	
			WATER	AN-105	9/17/02	9/17/02	27,000	0	
			34L87	AN-105	9/17/02	9/17/02	50,000	0	
			TNS88	AN-105	9/17/02	9/17/02	750	250	
			TAL88	AN-105	9/17/02	9/17/02	24,000	0	
			WATER	AN-105	9/17/02	9/17/02	35,000	0	
			EVAPF	AN-105	9/17/02	9/17/02	120,000	0	
			EVAPF	AW-102	9/20/02	9/20/02	50,000	0	
			AW-102	242-A	12/1/02	12/3/02	331,100	11	
			242-A	AW-106	12/1/02	12/3/02	34,737	11	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)

Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			242-A	LERF	12/1/02	12/3/02	296,400	0	
		Y	RETURN_1	AP-107	12/3/02	12/3/02	8,706	295	Sr/TRU & Entrained Solids Return from LAW Contractor 1
			AN-105	AW-102	12/10/02	12/13/02	681,500	23	
		Y	RETURN_2	AP-107	1/2/03	1/2/03	8,669	331	Entrained Solids Return from LAW Contractor 2
		Y	AP-102	AP-106	1/5/03	1/9/03	684,700	686	Deliver LAW Batch 2, Contractor 1
		Y	AP-104	AP-108	1/9/03	1/12/03	684,700	686	Deliver LAW Batch 2, Contractor 2
		Y	AW-101	AP-102	1/9/03	1/13/03	537,200	13,013	Retrieve/Stage LAW Batch 3, Contractor 1, Envelope A
		Y	LERF	AW-101-PUMP	1/9/03	1/13/03	308,100	0	Dilution Water
		Y	AW-101	AP-102	1/9/03	1/13/03	845,400	13,013	As-received Ghost
		Y	AW-101	AP-104	1/14/03	1/18/03	537,200	13,013	Retrieve/Stage LAW Batch 3, Contractor 2, Envelope A
		Y	LERF	AW-101-PUMP	1/14/03	1/18/03	308,100	0	Dilution Water
		Y	AW-101	AP-104	1/14/03	1/18/03	845,400	13,013	As-received Ghost
	Y		PIHLW_FEED_TANK	HLW-CONTRACTOR	6/1/02	2/24/03	136,000	5,135	Process Batch 1 of 1AZ, Envelope D (Batch 1 Overall)
	Y		AZ-101	PIHLW_FEED_TANK	2/24/03	2/25/03	136,000	5,135	Deliver Batch 2 of 1AZ, Envelope D (Batch 2 Overall)
			AW-106	AW-101	3/1/03	3/3/03	550,400	26	
			ZNL87	SY-102	3/20/03	3/20/03	3,000	0	
			WATER	SY-102	3/20/03	3/20/03	6,000	0	
			SPN87	SY-102	3/20/03	3/20/03	25,000	0	
			SY-102	AW-102	4/4/03	4/4/03	29,999	1	
			SY-102	AW-102	4/4/03	4/4/03	4,000	0	
		Y	RETURN_1	AP-107	4/28/03	4/28/03	8,679	325	Sr/TRU & Entrained Solids Return from LAW Contractor 1

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
		Y	RETURN_2	AP-107	5/22/03	5/23/03	8,672	332	Entrained Solids Return from LAW Contractor 2
			AW-102	242-A	6/1/03	6/4/03	715,500	24	
			242-A	AW-106	6/1/03	6/4/03	34,944	24	
			242-A	LERF	6/1/03	6/4/03	680,600	0	
			AN-105	AW-102	6/10/03	6/10/03	0	0	
			AW-106	AW-101	7/1/03	7/1/03	34,750	2	
		Y	RETURN_1	AP-107	9/12/03	9/12/03	8,674	332	Sr/TRU & Entrained Solids Return from LAW Contractor 1
			TNS88	AN-105	9/17/03	9/17/03	750	250	
			WESF	AN-105	9/17/03	9/17/03	5,000	0	
			TAL88	AN-105	9/17/03	9/17/03	24,000	0	
			WATER	AN-105	9/17/03	9/17/03	35,000	0	
			34L87	AN-105	9/17/03	9/17/03	57,000	0	
			WATER	AN-105	9/17/03	9/17/03	8,000	0	
			EVAPF	AN-105	9/17/03	9/17/03	120,000	0	
			WATER	AN-105	9/18/03	9/18/03	22,000	0	
			EVAPF	AW-102	9/20/03	9/20/03	35,000	0	
		Y	AP-102	AP-106	9/29/03	10/2/03	740,300	1,581	Deliver LAW Batch 3, Contractor 1
		Y	RETURN_2	AP-107	10/6/03	10/6/03	8,669	332	Entrained Solids Return from LAW Contractor 2
		Y	AP-104	AP-108	10/2/03	10/6/03	740,300	1,581	Deljver LAW Batch 3, Contractor 2
		Y	AN-103	AP-102	10/3/03	10/6/03	436,600	28,133	Retrieve/Stage LAW Batch 4, Contractor 1, Envelope A
		Y	LERF	AN-103-PUMP	10/3/03	10/6/03	264,900	0	Dilution Water
		Y	AN-103	AP-102	10/3/03	10/6/03	738,300	549	As-received Ghost
		Y	AN-103	AP-104	10/7/03	10/10/03	436,600	28,133	Retrieve/Stage LAW Batch 4, Contractor 2, Envelope A
		Y	LERF	AN-103-PUMP	10/7/03	10/10/03	264,900	0	Dilution Water
		Y	AN-103	AP-104	10/7/03	10/10/03	738,300	549	As-received Ghost

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Table A-1. Projected Transfers Through October 2011. (26 sheets)

Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
		Y	RETURN_1	AP-107	11/14/03	11/14/03	8,675	330	Sr/TRU & Entrained Solids Return from LAW Contractor 1
	Y		PIHLW_FEED_TANK	HLW-CONTRACTOR	2/25/03	11/20/03	136,000	5,135	Process Batch 2 of 1AZ, Envelope D (Batch 2 Overall)
	Y		AZ-102	PIHLW_FEED_TANK	11/20/03	11/21/03	145,900	6,032	Deliver Batch 1 of 2AZ, Envelope D (Batch 3 Overall)
		Y	RETURN_2	AP-107	11/25/03	11/25/03	8,675	330	Entrained Solids Return from LAW Contractor 2
			AW-102	242-A	12/1/03	12/1/03	35,011	1	
			242-A	AW-106	12/1/03	12/1/03	756	1	
			242-A	LERF	12/1/03	12/1/03	34,256	0	
			AN-105	AW-102	12/10/03	12/11/03	268,900	9	
			AW-106	AW-101	1/1/04	1/1/04	746	0	
		Y	RETURN_1	AP-107	1/3/04	1/3/04	8,674	330	Sr/TRU & Entrained Solids Return from LAW Contractor 1
		Y	RETURN_2	AP-107	1/14/04	1/14/04	8,674	330	Entrained Solids Return from LAW Contractor 2
		Y	RETURN_1	AP-107	2/22/04	2/22/04	8,674	330	Sr/TRU & Entrained Solids Return from LAW Contractor 1
		Y	RETURN_2	AP-107	3/3/04	3/3/04	8,674	330	Entrained Solids Return from LAW Contractor 2
			WATER	SY-102	3/20/04	3/20/04	5,000	0	
			ZNL87	SY-102	3/20/04	3/20/04	3,000	0	
			SPN87	SY-102	3/20/04	3/20/04	25,000	0	
			SY-102	AW-102	4/4/04	4/4/04	29,999	1	
			SY-102	AW-102	4/4/04	4/4/04	3,000	0	
		Y	RETURN_1	AP-107	4/13/04	4/13/04	8,674	330	Sr/TRU & Entrained Solids Return from LAW Contractor 1
		Y	RETURN_2	AP-107	4/22/04	4/22/04	8,674	330	Entrained Solids Return from LAW Contractor 2
		Y	AP-102	AP-106	5/3/04	5/7/04	753,200	1,687	Deliver LAW Batch 4, Contractor 1

Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
		Y	WASH-WATER	AP-102	5/8/04	5/8/04	118,100	0	Flush Water for Solids Cleanout
		Y	AP-104	AP-108	5/7/04	5/10/04	753,200	1,687	Deliver LAW Batch 4, Contractor 2
		Y	WASH-WATER	AP-104	5/11/04	5/11/04	118,100	0	Flush Water for Solids Cleanout
			AN-105	AW-102	5/12/04	5/12/04	0	0	
		Y	AP-102	AN-105	5/13/04	5/13/04	209,500	9,168	Cleanout Accumulated Solids
		Y	AP-104	AN-105	5/14/04	5/14/04	209,500	9,168	Cleanout Accumulated Solids
		Y	AY-101	AP-102	5/15/04	5/16/04	283,600	12	Stage LAW Batch 5, Envelope B, Contractor 1
		Y	AY-101	AP-104	5/17/04	5/18/04	279,700	11	Stage LAW Batch 5, Envelope B, Contractor 2
			AX-103	AN-103	1/11/04	5/29/04	312,500	2,846	
			AW-102	242-A	6/1/04	6/2/04	301,900	10	
			242-A	AW-106	6/1/04	6/2/04	11,234	10	
			242-A	LERF	6/1/04	6/2/04	290,700	0	
		Y	RETURN_1	AP-107	6/5/04	6/5/04	8,675	331	Sr/TRU & Entrained Solids Return from LAW Contractor 1
			AN-105	AW-102	6/10/04	6/11/04	231,200	9	
		Y	RETURN_2	AP-107	6/15/04	6/16/04	8,682	331	Entrained Solids Return from LAW Contractor 2
			AW-106	AW-101	7/1/04	7/1/04	11,151	1	
		Y	RETURN_1	AP-107	8/1/04	8/1/04	8,681	331	Sr/TRU & Entrained Solids Return from LAW Contractor 1
		Y	RETURN_2	AP-107	8/11/04	8/11/04	8,678	331	Entrained Solids Return from LAW Contractor 2
			C-103	AN-103	5/29/04	8/12/04	290,500	10,424	
			TNS88	AN-105	9/17/04	9/17/04	750	250	
			ZNL87	SY-102	9/17/04	9/17/04	3,000	0	
			SPN87	SY-102	9/17/04	9/17/04	25,000	0	
			TAL88	AN-105	9/17/04	9/17/04	24,000	0	
			34L87	AN-105	9/17/04	9/17/04	50,000	0	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			WATER	AN-105	9/17/04	9/17/04	35,000	0	
			WESF	AN-105	9/17/04	9/17/04	5,000	0	
			EVAPF	AN-105	9/17/04	9/17/04	120,000	0	
			WATER	SY-102	9/17/04	9/19/04	426,000	0	
			WATER	AN-105	9/19/04	9/19/04	27,000	0	
			WATER	SY-102	9/19/04	9/19/04	6,000	0	
			WATER	AW-105	9/19/04	9/20/04	88,000	0	
			EVAPF	AW-102	9/20/04	9/20/04	85,000	0	
			IFL96	AW-105	9/19/04	9/20/04	200,000	0	
	Y		PIHLW_FE ED_TANK	HLW- CONTRAC TOR	11/21/03	9/26/04	145,900	6,032	Process Batch 1 of 2AZ, Envelope D (Batch 3 Overall)
		Y	RETURN_1	AP-107	9/27/04	9/27/04	8,681	331	Sr/TRU & Entrained Solids Return from LAW Contractor 1
	Y		AZ-102	PIHLW_F EED TAN K	9/26/04	9/27/04	145,900	6,032	Deliver Batch 2 of 2AZ, Envelope D (Batch 4 Overall)
		Y	RETURN_2	AP-107	10/7/04	10/7/04	8,678	331	Entrained Solids Return from LAW Contractor 2
		Y	RETURN_1	AP-107	11/23/04	11/23/04	8,681	331	Sr/TRU & Entrained Solids Return from LAW Contractor 1
			A-102	AN-103	8/12/04	11/30/04	102,200	744	
			AW-102	242-A	12/1/04	12/2/04	316,200	12	
			242-A	AW-106	12/1/04	12/2/04	95,369	12	
			242-A	LERF	12/1/04	12/2/04	220,900	0	
		Y	RETURN_2	AP-107	12/3/04	12/3/04	8,678	331	Entrained Solids Return from LAW Contractor 2
			AN-105	AW-102	12/10/04	12/11/04	258,900	9	
			AW-106	AW-101	1/1/05	1/1/05	95,306	4	
			AN-103	AN-104	1/17/05	1/17/05	67,122	1,770	
			AN-103	AW-104	1/17/05	1/18/05	17,750	468	
			AN-103	AW-103	1/18/05	1/18/05	3,897	103	
			AN-103	AP-105	1/18/05	1/18/05	43,576	1,147	
			AN-103	AP-103	1/18/05	1/18/05	42,878	1,128	
			AN-103	AP-101	1/18/05	1/18/05	38,554	1,014	
			AN-103	AN-101	1/18/05	1/19/05	28,962	761	

Table A-1. Projected Transfers Through October 2011. (26 sheets)

Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
		Y	RETURN_1	AP-107	1/19/05	1/19/05	8,681	331	Sr/TRU & Entrained Solids Return from LAW Contractor 1
		Y	RETURN_2	AP-107	1/29/05	1/29/05	8,678	331	Entrained Solids Return from LAW Contractor 2
		Y	RETURN_1	AP-107	3/17/05	3/17/05	8,681	331	Sr/TRU & Entrained Solids Return from LAW Contractor 1
		Y	AP-106	LAW-CONTRACTOR-1	6/1/02	3/18/05	2,865,000	4,311	Process Envelope A Batches Contractor 1
		Y	AP-108	LAW-CONTRACTOR-2	6/1/02	3/19/05	2,865,000	4,295	Process Envelope A Batches Contractor 2
		Y	AP-102	AP-106	3/18/05	3/20/05	277,000	552	Deliver LAW Batch 5, Contractor 1, Envelope B
		Y	AP-104	AP-108	3/20/05	3/21/05	273,000	544	Deliver LAW Batch 5, Contractor 2, Envelope B
		Y	AN-107	AP-102	3/21/05	3/23/05	481,700	22	Retrieve/Stage LAW Batch 6/7, Contractor 1, Envelope C
		Y	LERF	AN-107-PUMP	3/21/05	3/23/05	72,259	0	Dilution Water
		Y	AN-107	AP-102	3/21/05	3/23/05	554,000	22	As-received Ghost
		Y	AN-107	AP-104	3/24/05	3/26/05	481,700	22	Retrieve/Stage LAW Batch 6/7, Contractor 2, Envelope C
		Y	LERF	AN-107-PUMP	3/24/05	3/26/05	72,260	0	Dilution Water
		Y	AN-107	AP-104	3/24/05	3/26/05	554,000	22	As-received Ghost
		Y	RETURN_2	AP-107	3/27/05	3/27/05	8,688	331	Entrained Solids Return from LAW Contractor 2
Y	Y		AY-102	AN-105	3/26/05	3/30/05	724,600	0	Initial Decant 2AY/6C
	Y		WASH-WATER	AY-102	3/30/05	4/1/05	324,000	0	First Wash. 2AY/6C

Table A-1. Projected Transfers Through October 2011. (26 sheets)
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Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
		Y	RETURN_1	AP-107	4/25/05	4/25/05	8,680	328	Sr/TRU & Entrained Solids Return from LAW Contractor 1
		Y	RETURN_2	AP-107	5/3/05	5/3/05	8,676	328	Entrained Solids Return from LAW Contractor 2
		Y	AP-106	LAW-CONTRACTOR-1	3/20/05	5/22/05	277,000	558	Process Envelope B Batch Contractor 1
		Y	AP-108	LAW-CONTRACTOR-2	3/21/05	5/23/05	273,000	550	Process Envelope B Batch Contractor 2
			AN-105	AW-102	5/21/05	5/25/05	772,500	13,977	
	Y		AY-102	AN-105	5/20/05	5/26/05	302,200	0	First Wash Decant 2AY/6C
	Y		WASH-WATER	AY-102	5/27/05	5/29/05	324,000	0	Second Wash 2AY/6C
			AW-102	242-A	6/1/05	6/5/05	872,800	31	
			242-A	AW-106	6/1/05	6/5/05	121,900	31	
			242-A	LERF	6/1/05	6/5/05	750,900	0	
			AN-105	AW-102	6/10/05	6/12/05	390,600	14	
			AW-106	AW-101	7/1/05	7/1/05	121,700	6	
		Y	AP-102	AP-106	7/13/05	7/14/05	170,400	184	Deliver LAW Batch 6, Contractor 1, Envelope C
		Y	AP-104	AP-108	7/16/05	7/17/05	170,500	186	Deliver LAW Batch 6, Contractor 2, Envelope C
	Y		AY-102	AN-105	7/17/05	7/19/05	322,100	0	Second Wash Decant 2AY/6C
	Y		WASH-WATER	AY-102	7/20/05	7/22/05	559,000	0	Transfer Water Add 2AY/6C
		Y	RETURN_1	AP-107	8/3/05	8/4/05	8,701	305	Sr/TRU & Entrained Solids Return from LAW Contractor 1
	Y		PIHLW_FEED_TANK	HLW-CONTRACTOR	9/27/04	8/4/05	145,900	6,032	Process Batch 2 of 2AZ, Envelope D (Batch 4 Overall)
	Y		AZ-102	PIHLW_FEED_TANK	8/4/05	8/5/05	145,900	6,032	Deliver Batch 3 of 2AZ, Envelope D (Batch 5 Overall)

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Table A-1. Projected Transfers Through October 2011. (26 sheets)

Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
		Y	AP-102	AP-106	8/10/05	8/12/05	389,000	420	Deliver LAW Batch 7, Contractor 1, Envelope C
		Y	AP-104	AP-108	8/13/05	8/15/05	389,100	426	Deliver LAW Batch 7, Contractor 2, Envelope C
		Y	AN-102	AP-102	8/13/05	8/16/05	481,700	23	Retrieve/Stage LAW Batch 8, Contractor 1, Envelope C
		Y	LERF	AN-102-PUMP	8/13/05	8/16/05	289,000	0	Dilution Water
		Y	AN-102	AP-102	8/13/05	8/16/05	770,700	23	As-received Ghost
		Y	AN-102	AP-104	8/17/05	8/20/05	481,700	23	Retrieve/Stage LAW Batch 8, Contractor 2, Envelope C
		Y	LERF	AN-102-PUMP	8/17/05	8/20/05	289,000	0	Dilution Water
		Y	AN-102	AP-104	8/17/05	8/20/05	770,700	23	As-received Ghost
		Y	RETURN_2	AP-107	9/2/05	9/2/05	8,672	329	Entrained Solids Return from LAW Contractor 2
			WESF	AN-105	9/17/05	9/17/05	5,000	0	
			TNS88	AN-105	9/17/05	9/17/05	750	250	
			TAL88	AN-105	9/17/05	9/17/05	24,000	0	
			34L87	AN-105	9/17/05	9/17/05	50,000	0	
			WATER	AN-105	9/17/05	9/17/05	35,000	0	
			WATER	AN-105	9/17/05	9/17/05	5,000	0	
			EVAPF	AN-105	9/17/05	9/17/05	120,000	0	
			WATER	AN-105	9/18/05	9/18/05	22,000	0	
			EVAPF	AW-102	9/20/05	9/20/05	35,000	0	
		Y	RETURN_1	AP-107	10/15/05	10/15/05	8,774	234	Sr/TRU & Entrained Solids Return from LAW Contractor 1
			AW-102	242-A	11/22/05	11/25/05	425,600	15	
			242-A	AW-106	11/22/05	11/25/05	51,529	15	
			242-A	LERF	11/22/05	11/25/05	374,100	0	
			AW-102	242-A	12/1/05	12/1/05	0	0	
			242-A	AW-106	12/1/05	12/1/05	0	0	
			242-A	LERF	12/1/05	12/1/05	0	0	
			AN-105	AW-102	12/10/05	12/12/05	581,100	20	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
		Y	RETURN_2	AP-107	12/13/05	12/13/05	8,673	330	Entrained Solids Return from LAW Contractor 2
			AW-105	AN-105	12/15/05	12/18/05	713,900	25	
		Y	RETURN_1	AP-107	12/27/05	12/27/05	8,778	232	Sr/TRU & Entrained Solids Return from LAW Contractor 1
		Y	AP-102	AP-106	12/24/05	12/27/05	770,700	51	Deliver LAW Batch 8, Contractor 1, Envelope C
		Y	AN-106	AP-102	12/28/05	12/31/05	547,500	24	Retrieve/Stage LAW Batch 9, Contractor 1, Envelope C
		Y	LERF	AN-106-PUMP	12/28/05	12/31/05	98,555	0	Dilution Water
		Y	AN-106	AP-102	12/28/05	12/31/05	646,100	24	As-received Ghost
		Y	AP-104	AP-108	12/27/05	12/31/05	770,700	51	Deliver LAW Batch 8, Contractor 2, Envelope C
			AW-106	AW-101	1/1/06	1/1/06	51,422	2	
		Y	SY-102	AW-105	1/1/06	1/3/06	580,400	22,129	Cleanout Solids in 2SY
		Y	AN-106	AP-104	1/1/06	1/4/06	547,500	24	Retrieve/Stage LAW Batch 9, Contractor 2, Envelope C
		Y	LERF	AN-106-PUMP	1/1/06	1/4/06	98,555	0	Dilution Water
		Y	AN-106	AP-104	1/1/06	1/4/06	646,100	24	As-received Ghost
			AW-105	AN-105	3/1/06	3/2/06	321,000	11	
			ZNL87	SY-102	3/20/06	3/20/06	3,000	0	
			WATER	SY-102	3/20/06	3/20/06	6,000	0	
			SPN87	SY-102	3/20/06	3/20/06	25,000	0	
			AN-103	AW-105	4/2/06	4/4/06	458,900	12,056	
		Y	SY-101	SY-102	4/1/06	4/6/06	537,500	5,484	Retrieve/Stage LAW Batch 10
		Y	LERF	SY-101-PUMP	4/1/06	4/6/06	532,100	0	Dilution Water
		Y	SY-101	SY-102	4/1/06	4/6/06	1,082,000	611	As-received Ghost
			AN-103	AN-106	4/4/06	4/6/06	390,600	10,249	
		Y	SY-102	AN-102	4/7/06	4/10/06	1,027,000	1,457	Cross-site/Pre-stage LAW Batch 10

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
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Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
		Y	SY-101	SY-102	4/11/06	4/16/06	510,600	5,209	Retrieve/Stage LAW Batch 10
		Y	LERF	SY-101-PUMP	4/11/06	4/16/06	505,500	0	Dilution Water
		Y	SY-101	SY-102	4/11/06	4/16/06	1,028,000	580	As-received Ghost
		Y	SY-102	AN-107	4/17/06	4/20/06	983,800	640	Cross-site/Pre-stage LAW Batch 10
		Y	SY-101	SY-102	4/21/06	4/21/06	27,388	279	Retrieve/Stage LAW Batch 11
		Y	LERF	SY-101-PUMP	4/21/06	4/21/06	27,114	0	Dilution Water
		Y	SY-101	SY-102	4/21/06	4/21/06	55,131	31	As-received Ghost
			AW-102	242-A	6/1/06	6/4/06	581,100	20	
			242-A	AW-106	6/1/06	6/4/06	22,200	20	
			242-A	LERF	6/1/06	6/4/06	558,900	0	
			C-105	AN-103	11/30/04	6/7/06	891,200	31,875	
	Y		PIHLW_FEED_TANK	HLW-CONTRACTOR	8/5/05	6/12/06	145,900	6,032	Process Batch 3 of 2AZ, Envelope D (Batch 5 Overall)
	Y		AY-102	PIHLW_FEED_TANK	6/12/06	6/12/06	135,000	3,416	Deliver Batch 1 of 2AY/6C, Envelope D (Batch 6 Overall)
		Y	RETURN_1	AP-107	6/13/06	6/13/06	8,902	102	Sr/TRU & Entrained Solids Return from LAW Contractor 1
			AN-105	AW-102	6/10/06	6/14/06	872,900	30	
			AW-106	AW-101	7/1/06	7/1/06	22,041	1	
		Y	AP-102	AP-106	8/20/06	8/24/06	646,100	25	Deliver LAW Batch 9, Contractor 1, Envelope C
		Y	AP-104	AP-108	8/24/06	8/27/06	646,100	25	Deliver LAW Batch 9, Contractor 2, Envelope C
		Y	SY-103	SY-102	8/26/06	8/28/06	350,000	9,759	Retrieve/Stage LAW Batch 11
		Y	LERF	SY-103-PUMP	8/26/06	8/28/06	183,500	0	Dilution Water
		Y	SY-103	SY-102	8/26/06	8/28/06	537,500	1,449	As-received Ghost
		Y	AN-102	AP-102	8/25/06	8/30/06	1,014,000	44	Stage LAW Batch 10, Contractor 1, Envelope C

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Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
		Y	SY-102	AN-102	8/31/06	9/2/06	724,700	1,526	Cross-site/Pre-stage LAW Batch 11
		Y	SY-103	SY-102	9/3/06	9/5/06	350,000	9,759	Retrieve/Stage LAW Batch 11
		Y	LERF	SY-103-PUMP	9/3/06	9/5/06	183,500	0	Dilution Water
		Y	SY-103	SY-102	9/3/06	9/5/06	537,500	1,449	As-received Ghost
		Y	AN-107	AP-104	9/1/06	9/5/06	978,400	43	Stage LAW Batch 10, Contractor 2, Envelope C
		Y	SY-102	AN-107	9/6/06	9/7/06	537,500	1,434	Cross-site/Pre-stage LAW Batch 11
			A-104	AN-103	6/7/06	9/15/06	29,319	832	
			WESF	AN-105	9/17/06	9/17/06	5,000	0	
			TNS88	AN-105	9/17/06	9/17/06	750	250	
			TAL88	AN-105	9/17/06	9/17/06	25,000	0	
			WATER	AN-105	9/17/06	9/17/06	35,000	0	
			34L87	AN-105	9/17/06	9/17/06	57,000	0	
			EVAPF	AN-105	9/17/06	9/17/06	120,000	0	
			WATER	AN-105	9/18/06	9/18/06	30,000	0	
			C-204	AN-103	9/15/06	9/22/06	3,808	55	
			C-201	AN-103	9/22/06	9/28/06	2,522	59	
			AX-104	AN-103	9/28/06	11/3/06	19,592	572	
			AW-102	242-A	12/1/06	12/5/06	872,900	30	
			242-A	AW-106	12/1/06	12/5/06	75,050	30	
			242-A	LERF	12/1/06	12/5/06	797,800	0	
			AN-105	AW-102	12/10/06	12/12/06	431,900	15	
		Y	RETURN_1	AP-107	12/24/06	12/24/06	8,937	66	Sr/TRU & Entrained Solids Return from LAW Contractor 1
			AW-106	AW-101	1/1/07	1/1/07	74,822	3	
	Y		PIHLW_FEED_TANK	HLW-CONTRACTOR	6/12/06	1/4/07	135,000	3,416	Process Batch 1 of 2AY/6C, Envelope D (Batch 6 Overall)
	Y		AY-102	PIHLW_FEED_TANK	1/4/07	1/4/07	135,000	3,416	Deliver Batch 2 of 2AY/6C, Envelope D (Batch 7 Overall)
			S-103	SY-101	7/24/06	1/15/07	719,200	1,011	
			AX-102	AN-103	11/3/06	2/21/07	88,610	897	
			SX-113	SY-103	12/6/06	3/13/07	11,203	399	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
		Y	AP-102	AP-106	3/13/07	3/19/07	1,014,000	44	Deliver LAW Batch 10, Contractor 1, Envelope C
			WATER	SY-102	3/20/07	3/20/07	5,000	0	
			SPN87	SY-102	3/20/07	3/20/07	25,000	0	
		Y	AN-102	AP-102	3/19/07	3/22/07	711,200	31	Stage LAW Batch 11, Contractor 1, Envelope C
		Y	AP-104	AP-108	3/19/07	3/23/07	978,400	43	Deliver LAW Batch 10, Contractor 2, Envelope C
		Y	AN-107	AP-104	3/24/07	3/26/07	524,700	23	Stage LAW Batch 11, Contractor 2, Envelope C
			SY-102	AW-102	4/4/07	4/4/07	29,195	1	
			AN-103	AN-106	5/23/07	5/26/07	685,000	13,746	
			AW-102	242-A	6/1/07	6/3/07	461,100	16	
			242-A	AW-106	6/1/07	6/3/07	33,509	16	
			242-A	LERF	6/1/07	6/3/07	427,600	0	
			AN-105	AW-102	6/10/07	6/10/07	0	0	
			SY-101	AN-102	6/20/07	6/25/07	997,400	1,678	
			AN-103	AN-107	6/24/07	6/26/07	410,600	8,230	
			AN-102	AN-107	6/26/07	6/29/07	541,200	4,267	
			AW-106	AW-101	7/1/07	7/1/07	33,387	2	
			SX-112	SY-103	3/13/07	7/23/07	485,300	16,406	
	Y		PIHLW_FEED_TANK	HLW-CONTRACTOR	1/4/07	7/29/07	135,000	3,416	Process Batch 2 of 2AY/6C, Envelope D (Batch 7 Overall)
		Y	RETURN_1	AP-107	7/29/07	7/29/07	8,967	36	Sr/TRU & Entrained Solids Return from LAW Contractor 1
	Y		AY-102	PIHLW_FEED_TANK	7/29/07	7/29/07	135,000	3,416	Deliver Batch 3 of 2AY/6C, Envelope D (Batch 8 Overall)
			TNS88	AN-105	9/17/07	9/17/07	750	250	
			TAL88	AN-105	9/17/07	9/17/07	25,000	0	
			34L87	AN-105	9/17/07	9/17/07	50,000	0	
			WATER	AN-105	9/17/07	9/17/07	35,000	0	
			WESF	AN-105	9/17/07	9/17/07	5,000	0	
			WATER	AN-105	9/17/07	9/17/07	27,000	0	
			EVAPF	AN-105	9/17/07	9/17/07	120,000	0	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			EVAPF	AW-102	9/20/07	9/20/07	35,000	0	
			SX-110	SY-103	7/23/07	11/25/07	285,900	8,910	
			AW-102	242-A	12/1/07	12/1/07	35,013	1	
			242-A	AW-106	12/1/07	12/1/07	1,120	1	
			242-A	LERF	12/1/07	12/1/07	33,893	0	
			AN-105	AW-102	12/10/07	12/11/07	259,900	9	
			AW-106	AW-101	1/1/08	1/1/08	1,111	0	
		Y	AP-102	AP-106	1/16/08	1/19/08	711,200	31	Deliver LAW Batch 11, Contractor 1, Envelope C
		Y	AP-104	AP-108	1/19/08	1/22/08	524,700	23	Deliver LAW Batch 11, Contractor 2, Envelope C
			SX-115	SY-103	11/25/07	1/26/08	51,011	1,557	
	Y		PIHLW_FEED_TANK	HLW-CONTRACTOR	7/29/07	2/20/08	135,000	3,416	Process Batch 3 of 2AY/6C, Envelope D (Batch 8 Overall)
	Y		AY-102	PIHLW_FEED_TANK	2/20/08	2/20/08	135,000	3,416	Deliver Batch 4 of 2AY/6C, Envelope D (Batch 9 Overall)
		Y	RETURN_1	AP-107	3/12/08	3/12/08	8,968	33	Sr/TRU & Entrained Solids Return from LAW Contractor 1
			WATER	SY-102	3/20/08	3/20/08	5,000	0	
			SPN87	SY-102	3/20/08	3/20/08	25,000	0	
			SY-102	AW-102	4/4/08	4/4/08	29,999	1	
			AW-102	242-A	6/1/08	6/2/08	289,900	10	
			242-A	AW-106	6/1/08	6/2/08	12,379	10	
			242-A	LERF	6/1/08	6/2/08	277,500	0	
			AN-105	AW-102	6/10/08	6/10/08	0	0	
			AW-106	AW-101	7/1/08	7/1/08	12,300	1	
		Y	AP-108	LAW-CONTRACTOR-2	7/17/05	8/3/08	3,479,000	809	Process Envelope C Batches Contractor 2
		Y	RETURN_2	AP-107	8/4/08	8/4/08	8,149	310	Entrained Solids Return from LAW Contractor 2
	Y		PIHLW_FEED_TANK	HLW-CONTRACTOR	2/20/08	9/13/08	135,000	3,416	Process Batch 4 of 2AY/6C, Envelope D (Batch 9 Overall)

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
	Y		AY-102	PIHLW_F EED_TAN K	9/13/08	9/13/08	135,000	3,416	Deliver Batch 5 of 2AY/6C, Envelope D (Batch 10 Overall)
			TNS88	AN-105	9/17/08	9/17/08	750	250	
			WATER	AN-105	9/17/08	9/17/08	5,000	0	
			TAL88	AN-105	9/17/08	9/17/08	25,000	0	
			WESF	AN-105	9/17/08	9/17/08	5,000	0	
			WATER	AN-105	9/17/08	9/17/08	35,000	0	
			34L87	AN-105	9/17/08	9/17/08	50,000	0	
			EVAPF	AN-105	9/17/08	9/17/08	120,000	0	
			WATER	AN-105	9/18/08	9/18/08	22,000	0	
			EVAPF	AW-102	9/20/08	9/20/08	85,000	0	
		Y	AP-106	LAW- CONTRAC TOR-1	7/14/05	9/27/08	3,701,000	810	Process Envelope C Batches Contractor 1
		Y	RETURN_1	AP-107	9/28/08	9/28/08	7,048	28	Sr/TRU & Entrained Solids Return from LAW Contractor 1
			AP-107	AZ-101	10/9/08	10/10/08	338,400	10,357	
			AN-103	AP-107	10/20/08	10/25/08	1,113,000	3,571	
			AW-102	242-A	12/1/08	12/1/08	85,032	3	
			242-A	AW-106	12/1/08	12/1/08	891	3	
			242-A	LERF	12/1/08	12/1/08	84,141	0	
			AN-105	AW-102	12/10/08	12/11/08	259,900	9	
			AW-106	AW-101	1/1/09	1/1/09	867	0	
			U-202	UA-1	1/4/09	1/11/09	29,792	1,061	
			U-203	UA-1	1/11/09	1/17/09	15,084	538	
			AX-101	AN-103	2/21/07	2/26/09	2,167,000	6,072	
			U-110	UA-1	1/17/09	2/27/09	100,200	3,312	
			UA-1	SY-102	2/28/09	3/1/09	145,500	4,907	
			C-202	AN-103	2/26/09	3/3/09	1,208	28	
			WATER	SY-102	3/20/09	3/20/09	5,000	0	
			SPN87	SY-102	3/20/09	3/20/09	25,000	0	
			SY-102	AW-102	4/4/09	4/4/09	29,999	1	
	Y		PIHLW_FE ED_TANK	HLW- CONTRAC TOR	9/13/08	4/7/09	135,000	3,416	Process Batch 5 of 2AY/6C, Envelope D (Batch 10 Overall)
	Y		AY-102	PIHLW_F EED_TAN K	4/7/09	4/7/09	135,000	3,416	Deliver Batch 6 of 2AY/6C, Envelope D (Batch 11 Overall)

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Table A-1. Projected Transfers Through October 2011. (26 sheets)

Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			U-110	UA-2	2/27/09	4/29/09	145,200	4,798	
			UA-2	SY-102	4/30/09	5/1/09	145,600	4,795	
			A-105	AN-103	3/3/09	5/26/09	52,980	1,545	
			U-110	UA-1	4/29/09	5/31/09	75,945	2,510	
			C-203	AN-103	5/26/09	6/2/09	6,429	151	
			AW-102	242-A	6/1/09	6/2/09	289,900	10	
			242-A	AW-106	6/1/09	6/2/09	10,702	10	
			242-A	LERF	6/1/09	6/2/09	279,200	0	
			AN-105	AW-102	6/10/09	6/10/09	0	0	
			AW-106	AW-101	7/1/09	7/1/09	10,622	0	
			U-101	UA-1	5/31/09	7/30/09	28,629	668	
			C-108	AN-103	6/2/09	8/18/09	121,700	3,842	
			WESF	AN-105	9/17/09	9/17/09	5,000	0	
			WATER	AN-105	9/17/09	9/17/09	35,000	0	
			34L87	AN-105	9/17/09	9/17/09	57,000	0	
			WATER	AN-105	9/17/09	9/17/09	8,000	0	
			TNS88	AN-105	9/17/09	9/17/09	750	250	
			TAL88	AN-105	9/17/09	9/17/09	26,000	0	
			EVAPF	AN-105	9/17/09	9/17/09	120,000	0	
			WATER	AN-105	9/18/09	9/18/09	22,000	0	
			EVAPF	AW-102	9/20/09	9/20/09	35,000	0	
			U-104	UA-1	7/30/09	10/20/09	41,182	966	
			UA-1	SY-102	10/21/09	10/22/09	146,300	4,144	
	Y		PIHLW_FED_TANK	HLW-CONTRACTOR	4/7/09	10/30/09	135,000	3,416	Process Batch 6 of 2AY/6C, Envelope D (Batch 11 Overall)
			C-111	AN-103	8/18/09	10/30/09	204,800	7,081	
			U-104	UA-2	10/20/09	11/10/09	10,889	255	
			AW-102	242-A	12/1/09	12/1/09	35,013	1	
			242-A	AW-106	12/1/09	12/1/09	570	1	
			242-A	LERF	12/1/09	12/1/09	34,444	0	
			AN-105	AW-102	12/10/09	12/11/09	270,900	9	
			U-112	UA-2	11/10/09	12/31/09	134,100	4,664	
			AW-106	AW-101	1/1/10	1/1/10	560	0	
			UA-2	SY-102	1/1/10	1/1/10	145,500	4,919	
			U-112	UA-1	12/31/09	1/18/10	49,643	1,727	
			U-204	UA-1	1/18/10	1/24/10	14,154	503	
			U-201	UA-1	1/24/10	1/31/10	29,794	1,061	
			U-106	UA-1	1/31/10	2/12/10	52,886	131	
			UA-1	SY-102	2/13/10	2/14/10	147,000	3,423	
			U-106	UA-2	2/12/10	3/17/10	149,500	370	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			UA-2	SY-102	3/18/10	3/19/10	150,000	373	
			WATER	SY-102	3/20/10	3/20/10	5,000	0	
			SPN87	SY-102	3/20/10	3/20/10	25,000	0	
			SY-102	AW-102	4/4/10	4/4/10	29,999	1	
			U-106	UA-1	3/17/10	4/19/10	149,500	370	
			U-106	UA-2	4/19/10	5/22/10	149,500	370	
			AW-102	242-A	6/1/10	6/2/10	300,900	10	
			242-A	AW-106	6/1/10	6/2/10	16,159	10	
			242-A	LERF	6/1/10	6/2/10	284,700	0	
			AN-105	AW-102	6/10/10	6/10/10	0	0	
			AW-106	AW-101	7/1/10	7/1/10	16,078	1	
			WESF	AN-105	9/17/10	9/17/10	5,000	0	
			WATER	SY-102	9/17/10	9/17/10	5,000	0	
			WATER	AN-105	9/17/10	9/17/10	35,000	0	
			WATER	AN-105	9/17/10	9/17/10	25,000	0	
			SPN87	SY-102	9/17/10	9/17/10	25,000	0	
			TNS88	AN-105	9/17/10	9/17/10	750	250	
			WATER	AN-105	9/17/10	9/17/10	22,000	0	
			TAL88	AN-105	9/17/10	9/17/10	26,000	0	
			34L87	AN-105	9/17/10	9/17/10	50,000	0	
			EVAPF	AN-105	9/17/10	9/18/10	120,000	0	
			WATER	AN-105	9/18/10	9/18/10	5,000	0	
			EVAPF	AW-102	9/20/10	9/20/10	85,000	0	
			EVAPF	AW-102	10/19/10	10/19/10	35,000	0	
			AW-102	242-A	12/1/10	12/2/10	120,000	4	
			242-A	AW-106	12/1/10	12/2/10	1,207	4	
			242-A	LERF	12/1/10	12/2/10	118,800	0	
			AN-105	AW-102	12/10/10	12/11/10	285,900	10	
			AW-106	AW-101	1/1/11	1/1/11	1,173	0	
			TX-109	TA-2	1/4/11	2/4/11	145,100	4,929	
			BY-110	BA-3	1/4/11	2/8/11	147,400	2,619	
			TY-101	TA-3	1/4/11	2/26/11	146,300	3,722	
			T-106	TA-1	1/4/11	3/3/11	83,358	2,929	
			TX-109	TA-4	2/4/11	3/7/11	145,100	4,929	
			B-112	BA-1	1/4/11	3/9/11	73,902	1,083	
			BY-110	BA-4	2/8/11	3/16/11	147,400	2,619	
			WATER	AN-105	3/20/11	3/20/11	50,000	0	
			T-101	TA-1	3/3/11	3/25/11	61,500	2,213	
			SY-102	AW-102	4/4/11	4/4/11	29,360	640	
			BX-102	BA-2	1/4/11	4/4/11	77,293	2,445	
			TX-109	TA-6	3/7/11	4/8/11	145,100	4,929	

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Table A-1. Projected Transfers Through October 2011. (26 sheets)
Note: This table is extracted from Table H-1 of the *Tank Waste Remediation System Operations and Utilization Plan* (Kirkbride et al. 1997)

Boot Strap	HLW Flag	LAW Flag	From	To	Start Date	End Date	Liquid (gallons)	Solid (Gallons)	Notes
			B-111	BA-1	3/9/11	4/8/11	72,735	2,279	
			TY-101	TA-5	2/26/11	4/21/11	146,300	3,722	
			BY-110	BA-5	3/16/11	4/21/11	147,400	2,619	
			BX-112	BA-2	4/4/11	4/26/11	68,037	2,225	
			BA-3	AP-102	6/3/11	6/3/11	154,800	2,618	
			BA-4	AP-106	6/3/11	6/3/11	154,800	2,618	
			BA-1	AP-102	6/3/11	6/4/11	154,000	3,360	
			BA-5	AP-106	6/3/11	6/4/11	154,800	2,618	
			BA-2	AP-102	6/4/11	6/5/11	152,700	4,666	
			AN-102	AP-108	6/3/11	6/5/11	567600	4471.731	
			AN-103	AP-104	6/3/11	6/8/11	1100000	16309.103	
			AN-103	AP-108	6/8/11	6/8/11	1286.432	18.73	
			B-111	BA-6	4/8/11	6/8/11	145400	4557.783	
			BA-6	AP-108	6/9/11	6/10/11	152800	4554.889	
			AN-105	AW-102	6/10/11	6/10/11	50019.843	1.671	
			SY-103	AN-102	6/6/11	6/11/11	1081000	35221.667	
			AN-102	AP-108	6/12/11	6/14/11	373800	11943.632	
			WATER	AN-105	6/16/11	6/16/11	25000	0	
			AN-102	AP-102	6/14/11	6/17/11	624400	19936.032	
			AN-102	AP-106	6/17/11	6/17/11	85245.764	2709.747	
			SY-101	AN-102	6/18/11	6/23/11	1115000	1794.438	
			AN-102	AP-106	6/24/11	6/27/11	712100	1647.42	
			AW-106	AW-101	7/1/11	7/1/11	0.005	2.292E-07	
			BY-110	BA-4	6/3/11	7/9/11	147300	2617.469	
			S-105	SY-101	1/15/07	7/20/11	1537000	2458.692	
			BX-112	BA-3	6/3/11	7/20/11	145200	4746.215	
			B-111	BA-1	6/8/11	8/7/11	145300	4554.744	
			BY-110	BA-5	7/9/11	8/14/11	147300	2617.469	
			B-111	BA-6	8/7/11	8/15/11	17236.868	540.159	
			BX-112	BA-2	7/20/11	9/4/11	145200	4746.215	
			A-106	AN-103	10/30/09	9/4/11	259600	5796.036	
			SX-111	SY-103	1/26/08	9/5/11	606700	19768.212	
			BY-110	BA-6	8/15/11	9/15/11	129800	2307.057	

Table A-2. Waste Sources Names and Definitions for Table A-1.

1FL96	105-F,105-H, and 100-N Liquid TCO Waste
1KL96	100-K Liquid TCO Waste
1NS96	100-Area Solid TCO Waste
242-A	242-A Evaporator
34L87	300/400 Area Lab Waste
BA-X	Annex Tanks for NE Quadrant
BPTCO	B Plant TCO Waste
EVAPF	Evaporator Flush and Tank Farm Water
HLW-CONTRACTOR	HLW Contractor Processing Facility
LAW-CONTRACTOR-X	LAW Contractor Processing Facility
LERF	Evaporator Overheads Accumulation
PIHLW_FEED_TANK	Phase 1 HLW Contractor Feed Tank
PXTCO	PUREX TCO Waste
RETURN_X	Phase 1 LAW Contractor Returns Tanks
SPN87	S Plant Dilute Non-Complexed Waste
TA-X	Annex Tanks for NW Quadrant
TAL88	T Plant Supernate
TNS88	T Plant Solids
UA-X	Annex Tanks for U Farm
UNKN	Unknown Addition (Water)
WASH-CAUSTIC	Caustic Solution for Enhanced Wash
WASH-WATER	Dilute Caustic Solution for Solids Washing
WATER	Water
WCE88	East Area Complexed Salt Well Liquid
WCW88	West Area Complexed Salt Well Liquid
WESF	WESF Waste
WNE88	East Area Dilute, Non-Complexed Salt Well Liquid
WNW88	West Area Dilute, Non-Complexed Salt Well Liquid
ZNL87	Combined PFP Waste Stream

A.2 READINESS TO PROCEED UPDATE TO TWRSO&UP INFORMATION

Tables A-3 and A-4 were extracted from the *Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary* (Swita 1998).

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Envelope	Batch	Available Feed*			Dilution Water (ML)	Pre-stage Tank (static date)	Approximate Timing*					Feed Delivered to each Contractor		Contractor	Total feed delivered for both contractors*			
		Source Tank (static date)	Sodium (MT)	Volume (ML)			Batch	Begin	Start	retire*	retire*	Batch	Volume*			Delivery Time† (hrs)	Time‡ (hrs)	Sodium (MT)
A	1	241-AN-105 (static date)	1090	4.13	1.45	-	3/2001	6/2001	12/2001	12/2001	5.16	2.63	2.22	2.22	1-C1	1,027	5.25	
	2	241-AN-104 (static date)	1100	3.77	1.92	-	10/2001	12/2001	6/2002	1/2003	636	2.72	2.66	2.66	2-C1	1,070	5.54	
	3	241-AN-101 (static date)	991	4.27	2.48	-	1/2003	3/2003	8/2003	10/2003	428	2.86	3.9	3.9	3-C1	856	5.72	
	4	241-AP-101 (static date)	724	3.69	3.03	-	5/2003	10/2003	3/2004	5/2004	585	3.18	4.4	3.17	4-C1	1,170	6.36	
	5	241-AN-104 (4/1999) (10/1999)	491	3.83	0.45	-	5/2004	10/2004	3/2005	3/2005	575	2.87	3.9	288	5-C1	1,276	6.38	
	6	241-AZ-101 (static date)	359	3.12	-	-	3/2005	8/2005	1/2006	1/2006	118	1.05	1.4	59	6-C1	234	2.09	
	C	7	241-AN-107 (11/1997)	913	4.26	1.41	-	1/2006	5/2006	3/2006	3/2006	119	0.74	1.0	29	7-C1	238	1.48
		8	241-AN-102 (static date)	1060	4.07	2.52	-	4/2006	8/2006	3/2006	8/2006	477	2.96	4.1	240	8-C1	544	3.38
		9	241-AN-106 (static date)	846	4.32	0.95	-	4/2006	8/2006	10/2006	10/2006	477	2.96	4.1	240	9-C1	954	5.92
		10	241-AN-102 (7/1999)	846	4.32	0.95	-	8/2006	8/2006	10/2006	4/2007	411	2.55	3.5	207	10-C1	822	5.10
11		241-SV-101 (static date)	1390	4.28	4.37	-	12/2005	4/2007	8/2007	11/2007	615	3.82	5.2	306	11-C1	1,230	7.64	
12		241-SV-103 (static date)	718	2.79	1.67	-	12/2006	11/2007	3/2008	9/2008	452	2.81	3.8	256	12-C1	789	4.90	

Table A-3. Low-Activity Waste Source Tanks and Feed Batches. Taken from Table 4-3-1 of the Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary (Swits 1998).

This Available Feed Volume and quantity have not been reduced to account for the waste heats that will be left behind in the source tanks, pre-staging tanks, or staging tanks. †The Start/Pre-stage date is the earlier of (1) when wastes are first removed from the source tanks or (2) when confined degassing of wastes in the wet-heat tanks begins. ‡All dates are subject to change within the contract and CD limits. All dates and durations are based on a constant 2.0 MT/retire/contractor/day processing rate. The "Batch Ready" date is when the feed is ready for transfer to the privatization contractor's feed tanks (241-AP-106 or 241-AP-104). The feed is qualified and is in 241-AP-102 and 241-AP-104. The delivered quantity takes into account tank heats, dissolution of and separation of solids and mass balances. †Batch 7/8 is assumed to be pre-qualified in the source tank (241-AN-107) and the feed certification based upon mass balances. The Process Time shown in this table accounts for the 30-day heat remaining in the privatization contractor feed batches of the same envelope.

Table A-4. High-Level Waste Source Tanks and Feed Batches. Taken from Table 4-3 of the Tank Waste Remediation System Review and Disposal Mission Initial Updated Baseline Summary (Swits 1998).

Envelope	Batch	Available Feed ^a		Sluicing Receiver	Washing and Sluicing Tank	Approximate Timing ^b				Total Feed Delivered from Source Tank	Quantity (MT)	Volume (ML)	Quantity (MT)	Volume (ML)	Feed Delivered per Batch	Feed Delivered to Immobilization	Delivery Time (days)	Process Time (days)
		Source Tank Quantity (MT)	Quantity (MT)			Begin Sluicing	Begin Pre-treatment	Begin Pre-Batch ^c	Batch Delivered									
D	AZ-101	96.4	0.18	-	AZ-101	-	10/2000	8/2001	2/2003	11/2003	86.8	1.06	43.4	0.53	1	1	264	264
									2/2003	2/2003	8/2004	11/2003	48.5	0.55	1	285		
	AZ-102	161.5	0.39	-	AZ-102	-	4/2002	2/2003	8/2004	11/2003	97.0	1.10	48.5	0.55	1	285	285	
									8/2004	11/2003	48.5	0.55	1	285				
	AY-102	37.5	0.08	-	AZ-101	6/2003	6/2005	4/2004	6/2005	11/2006	32.9	0.49	1	200	200			
									6/2005	11/2006	32.9	0.49	1	200				
	C-106	156.3	0.75	-	AZ-101	6/2003	6/2006	4/2004	6/2006	2/2007	32.9	0.49	1	200	200			
									6/2006	2/2007	32.9	0.49	1	200				
	C-104	386.0	1.12	-	AZ-102	7/2005	7/2005	5/2008	3/2008	12/2008	46.9	0.54	1	285	285			
									3/2008	12/2008	46.9	0.54	1	285				
									10/2009	10/2009	23.5	0.27	1	143	143			

^aThe "Available Feed" volumes and quantities have not been reduced to account for the waste heats that will be left behind in the source tanks, pre-staging tanks, or staging tanks. The "Quantity" of feed is defined as the mass of equivalent non-volatile oxides excluding sodium and silicon, as defined in the Privatization contract. ^bAll dates are subject to change within the contract and ICD limits. All dates and durations are based on a constant 0.164 MT NVOL/day processing rate. ^cThe "Batch Ready" date is when the feed is ready for transfer to the Privatization contractor's facility. These dates do not include the time required for confirmation of waste form qualification (which is assumed to be performed prior to waste transfer). The current baseline has allocated an additional 6 months for the confirmation of waste form qualification. The actual duration of this activity will be determined through ICD negotiations. Processing times are based on an assumed immobilization facility processing rate of 0.164 MT of equivalent non-volatile oxides per day.

A.3 ANALYSIS OF THE TWRSO&UP TRANSFER SCHEDULE

Table A-5 presents the results of a computer-assisted analysis of the information in Table A-1. The "label" for each item is a designation assigned by the *Hanford Site Technical Baseline Database (HSTBD)* (Porter 1996); in some cases the description is slightly different than what is currently in the HSTBD to make it align better with the *Double-Shell Tank System Specification* (Grenard and Claghorn 1998); the batch volumes for an item reflect the quantities given in specific transfer records in Table A-1; the duration number is the end date of a specific transfer minus the start date plus one; the yearly volumes are summed for each type of transfer. In the event that a transfer spans the beginning of a new year (January 1) then a proportional quantity is assigned to each year. The total quantity is the sum from January 1, 1998, to January 1, 2011.

Table A-6 presents a map of the HSTBD designation for each type of transfer. A transfer type is defined by the "from" and "to" information in the transfer record.

Table A-5. Analysis of TWRSO&UP Transfers.

HSTBD number	Description	Batch, gal		Dur'n (d)		Yearly max, gal	Total, gal
		Min	Max	Min	Max		
Water	Water	5.00E+03	5.59E+05	1	6	2.25E+06	1.30E+07
tsd.1.2.5.1.F.11	Separated products (Entrained Solids, Sr-TRU, and Technetium) from the Phase I treatment/immobilization vendors returned to the DSTs.	7.08E+03	9.02E+03	1	2	1.26E+05	3.49E+05
tsd.1.2.5.F.17	Waste transferred to 242A for evaporation.	3.50E+04	1.48E+06	1	8	4.36E+06	1.76E+07
tsd.1.2.5.1.F.2	Concentrated waste transferred to AW-106.	5.71E+02	8.91E+05	1	8	2.42E+06	5.52E+06
tsd.1.2.5.1.F.30	Liquid waste transferred cross site from West Area to East Area.	2.92E+04	1.03E+06	1	13	3.88E+06	9.63E+06
tsd.1.2.5.1.F.4	Waste transferred from one East Area DST to another East Area DST.	4.00E+03	1.12E+06	1	39	9.82E+06	3.82E+07
tsd.2.2.6.1.F.5	Mobilized/conditioned West Area DST waste prepared for transfer for space management.	2.77E+04	1.08E+06	1	6	5.05E+06	5.05E+06
tsd.2.2.6.F.6	LAW waste transferred to AP-102 or -104 for blending, intermediate staging or qualification.	2.80E+05	1.01E+06	2	6	5.77E+06	2.09E+07
di.wf.temp.217	HLW transferred by 222-S Laboratory to the Double Shell Tank (DST) System.	6.00E+03	3.70E+04	1	1	6.20E+04	3.43E+05
di.wf.temp.26.1	Liquid waste in East Area SSTs ready for transfer into West Area DSTs including supernatant, interstitial liquids, and separable organic wastes.	0.00E+00	0.00E+00	0	0	0.00E+00	0.00E+00
di.wf.temp.26.2	Liquid waste in West Area SSTs ready for transfer into West Area DSTs including supernatant, interstitial liquids, and separable organic wastes.	1.11E+04	1.50E+05	7	83	6.00E+05	1.20E+06
tsd.1.2.5.1.F.20	Supernatant from East Area DSTs for transfer to East Area SST Sluicing Systems.	9.21E+05	9.21E+05	5	5	9.21E+05	9.21E+05
tsd.1.2.5.1.F.8	Liquid waste from 221-T operations & cleanup ready to be transferred to West Area DSTs.	1.00E+03	5.40E+04	1	1	5.60E+04	3.09E+05
tsd.1.2.5.F.2	HLW transferred from 105-F & 105-H Basin.	2.00E+04	2.00E+05	1	2	2.00E+05	2.73E+05
tsd.1.2.5.F.40	Liquid HLW transferred by Plutonium Finishing Plant. Dates to be replanned based upon new funding profile.	3.00E+03	4.00E+03	1	1	8.00E+03	2.80E+04
tsd.1.2.5.F.44	HLW Transferred by Plutonium-Uranium Extraction Plant.	5.00E+03	1.00E+04	1	1	1.00E+04	1.50E+04
tsd.1.2.5.F.49	K Basin sludges transferred by 100 K Area Facilities.	3.32E+05	3.32E+05	2	2	3.32E+05	3.32E+05
tsd.1.2.5.F.69.1.3	HLW transferred by WESF.	5.00E+03	1.00E+04	1	1	1.00E+04	6.00E+04
tsd.1.2.5.F.69.2.2	LLW (Liquid) Transferred by B Plant.	4.40E+04	4.40E+04	1	1	4.40E+04	4.40E+04
tsd.1.2.5.F.7	Radioactive/mixed liquid waste transferred by 340 Waste Handling Facility to DSTs.	5.00E+04	1.37E+05	1	2	1.37E+05	6.68E+05
tsd.2.F.1	Waste retrieved via sluicing from East Area SSTs and transferred to East Area DSTs.	1.24E+03	2.17E+06	6	737	2.57E+06	5.30E+06
tsd.2.F.2	Waste retrieved via sluicing from West Area SSTs and transferred to West Area DSTs.	1.16E+04	7.20E+05	1	176	1.53E+06	2.48E+06
tsd.3.4.2.F.14.1	HLW Sludges retrieved from AZ-101 for transfer to the Phase I, LAW/HLW Treatment/Immobilization Vendor.	1.38E+05	1.52E+05	1	2	2.93E+05	1.57E+06
tsd.3.4.2.F.9	LAW liquids and unintentionally entrained solids transferred to the Phase I LAW treatment/immobilization vendor.	1.71E+05	1.01E+06	2	7	3.21E+06	1.37E+07
tsd.1.2.5.1.F.22	Liquid waste transferred from 204-AR for storage in the East Area DSTs.	0.00E+00	0.00E+00	0	0	0.00E+00	0.00E+00
tsd.1.2.5.1.N.28W	Salt Well Pumping West	8.30E+04	4.35E+05	1	3	1.59E+06	2.52E+06
tsd.1.2.5.1.N.28E	Salt Well Pumping East	1.86E+05	1.86E+05	2	2	1.86E+05	1.86E+05
tsd.1.2.5.1.C.28W	Salt Well Pumping West	1.40E+04	2.49E+05	1	2	7.19E+05	8.50E+05
tsd.1.2.5.1.C.28E	Salt Well Pumping East	1.41E+05	7.75E+05	2	4	7.75E+05	9.16E+05

Table A-6. Transfers Associated With Each Hanford Site Technical Database Designation.

HSTBD number	Description	Transfer from	Transfer to
*tsd.1.2.5.1.F.11	Separated products (Entrained Solids, Sr-TRU, and Technetium) from the Phase I treatment/immobilization vendors returned to the DSTs.	RETURN_1 RETURN_2	AP-107 AP-107
*tsd.1.2.5.F.17	Waste transferred to 242A for evaporation	AW-102	242-A
*tsd.1.2.5.1.F.2	Concentrated waste transferred to AW-106.	242-A	AW-106
*tsd.1.2.5.1.F.22	Liquid waste transferred from 204-AR for storage in the East Area DSTs.	SPN87	AN-105
*tsd.1.2.5.1.F.28	Waste in West Area SSTs that has been transferred into West Area DSTs.	WNE88 WCW88 WNW88 WCE88 WNE88 WCE88	SY-102 SY-102 SY-102 AP-108 AP-106 AN-101
*tsd.1.2.5.1.F.30	Liquid waste transferred cross site from West Area to East Area.	SY-102 SY-102 SY-103 SY-102 SY-101 SY-102 SY-102 SY-102	AW-102 AN-107 AN-102 AN-102 AP-104 AN-102 AN-102 AW-105 AP-107

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Table A-6. Transfers Associated With Each Hanford Site Technical Database Designation.

HSTBD number	Description	Transfer from	Transfer to
*isd.1.2.5.1.F.4	Waste transferred from one East Area DST to another East Area DST.	AP-103	AW-102
		AN-103	AP-105
		AP-102	AP-103
		AP-106	AP-108
		AW-105	AP-108
		AW-106	AW-101
		AP-101	AP-107
		AP-106	AW-102
		AN-103	AN-101
		AN-102	AP-108
		AN-102	AP-103
		AP-105	AP-101
		AZ-102	AY-101
		AP-107	AW-102
		AP-101	AW-103
		AN-101	AP-103
		AP-108	AW-102
		AW-103	AP-107
		AW-105	AN-105
		AN-103	AW-103
		AW-105	AW-102
		AZ-101	AW-105
		AP-104	AP-102
		AP-104	AW-102
		AN-103	AN-107
		AN-102	AN-107
		AP-108	AN-105
		AN-102	AP-101
		AY-102	AN-105
		AP-105	AW-102
		AZ-102	AN-105
		AW-106	AP-105
		AY-102	AP-106
		AN-103	AW-105
		AW-106	AW-104
		AW-106	AP-108
		AN-103	AN-106
		AP-101	AW-102
		AN-105	AW-102
		AW-106	AN-106
		AP-108	AP-101
		AW-104	AP-107
		AW-104	AP-104
		AP-101	AW-104
		AW-102	AW-106
		AN-103	AP-103
		AW-106	AW-102
		AY-101	AP-108
		AW-106	AP-107
		AN-103	AP-108
AP-102	AN-105		
AW-106	AN-101		
AN-101	AP-105		
AZ-101	AY-101		
AP-107	AZ-101		
AN-103	AP-107		
AN-103	AW-104		
AW-106	AP-101		
AN-103	AP-101		
AN-102	AP-105		
AZ-102	AN-104		
AP-104	AN-105		

Table A-6. Transfers Associated With Each Hanford Site Technical Database Designation.

HSTBD number	Description	Transfer from	Transfer to
*tsd.2.2.6.1.F.5	Mobilized/conditioned West Area DST waste prepared for transfer for space management.	SY-101 SY-103	SY-102 SY-102
*tsd.2.2.6.F.6	LAW waste transferred to AP-102 or -104 for blending, intermediate staging or qualification.	AN-105 AW-101 AN-107 AN-107 AN-106 AN-104 AW-101 AY-101 AN-103 AN-105 AN-102 AN-104 AN-103 AN-106 AY-101 AN-102	AP-102 AP-102 AP-102 AP-104 AP-104 AP-102 AP-104 AP-102 AP-104 AP-104 AP-102 AP-104 AP-102 AP-104 AP-102 AP-104 AP-104
*DI.WF.temp.217	HLW transferred by 222-S Laboratory to the Double Shell Tank (DST) System.	SPN87 SPN87	SY-102 AP-106
*DI.WF.temp.26.1	Liquid waste in East Area SSTs ready for transfer into West Area DSTs including supernatant, interstitial liquids, and separable organic wastes.	B-111 BX-106 B-112 BY-103 BX-112 B-111 BX-102 BY-110 BY-110 BX-112 B-103 BX-112 BY-110 BY-110	BA-6 BA-4 BA-1 BA-5 BA-2 BA-1 BA-2 BA-3 BA-6 BA-3 BA-1 BA-4 BA-5 BA-4
	*DI.WF.temp.26.2 Liquid waste in West Area SSTs ready for transfer into West Area DSTs including supernatant, interstitial liquids, and separable organic wastes.	U-106 T-101 U-202 T-106 U-101 TY-101 TY-101 U-110 U-104 U-104 TY-101 TX-109 TX-109 U-106 U-112 TX-109 U-112 U-203 U-201 U-110 T-101 U-204 TY-105 TX-109 U-111	UA-2 TA-1 UA-1 TA-1 UA-1 TA-3 TA-5 UA-1 UA-1 UA-2 TA-2 TA-2 TA-1 UA-1 UA-1 TA-6 UA-2 UA-1 UA-1 UA-2 TA-2 TA-2 TA-1 UA-1 UA-1 TA-6 UA-2 UA-1 UA-1 UA-2 TA-3 UA-1 TA-2 TA-4 UA-2

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Table A-6. Transfers Associated With Each Hanford Site Technical Database Designation.

HSTBD number	Description	Transfer from	Transfer to
*tsd.2.F.2	Waste retrieved via sluicing from West Area SSTs and transferred to West Area DSTs.	SX-110 S-105 SX-113 SX-115 SX-106 S-103 S-102 SX-112 SX-111 TA-4 TA-1 TA-2 TA-6 TA-3 UA-1 TA-5 UA-2	SY-103 SY-101 SY-103 SY-103 SY-103 SY-101 SY-101 SY-103 SY-103 SY-102 SY-102 SY-102 SY-102 SY-102 SY-102 SY-102 SY-102
*tsd.3.4.2.F.14.1	HLW Sludges retrieved from AZ-101 for transfer to the Phase I, LAW/HLW Treatment/Immobilization Vendor.	AZ-101 AY-102 AZ-102	PIHLW_FEED_TANK PIHLW_FEED_TANK PIHLW_FEED_TANK
*tsd.3.4.2.F.9	LAW liquids and unintentionally entrained solids transferred to the Phase I LAW treatment/immobilization vendor.	AP-102 AP-104	AP-106 AP-108
*Water	Water from Various Sources	WATER WATER WATER EVAPF LERF WATER WASH-WATER WATER LERF EVAPF LERF EVAPF LERF WATER WATER WATER WASH-WATER EVAPF WASH-CAUSTIC WATER WASH-WATER LERF EVAPF LERF WATER WASH-WATER WATER LERF WASH-WATER LERF LERF	SY-102 AW-105 AP-108 SY-102 AN-102-PUMP AW-102 AY-102 AP-106 AN-106-PUMP AW-102 AN-103-PUMP AP-106 SY-103-PUMP AN-101 AP-105 AP-107 AZ-101 AN-105 AN-107 AP-104 AZ-102 AW-101-PUMP AW-106 AN-104-PUMP AN-105 AP-102 AY-102 AN-105-PUMP AP-104 SY-101-PUMP AN-107-PUMP

A.4 REQUIREMENT SPECIFIC DERIVATIONS

Table A-7 provides additional detail regarding the derivation of each of the performance requirements. The paragraph number refers to the paragraph of the DST System Specification (Grenard and Claghorn 1998).

Table A-7. Requirement Specific Derivations. (4 Sheets)

Req No	Paragraph	Title	HSTBD number	HSTBD description	Quantity associated with HSTBD number		Units	Reference table, location
					Min	Max		
1	3.2.1.2.2.a	200 West Area Waste Batch Transfer	tsd.2.2.6.1.F.5		2.77+04	1.08+06	gal	A-5 (Min & Max Batch Size) See Table A-8 for duration
2	3.2.1.2.5.a	200 East Area Waste Batch Transfer	tsd.1.2.5.1.F.4		4.00+03	1.12+06	gal	A-5 (Min & Max Batch Size)
3	3.2.1.2.3.a	Cross-site Waste Transfer Volume	tsd.1.2.5.1.F.30		2.92+04	1.03+06	gal	A-5 (Min & Max Batch Size)
4	3.2.1.4.3.a	High-Level Waste Batch Sizes, Phase I	tsd.3.4.2.2.F.3		4.76+04	2.91+05	gal	A-4 (Min & Max Available Feed)
5	3.2.1.4.3.b	High-Level Waste Preparation Phase I	tsd.3.4.2.2.F.3	Add transfer solution	1	2	days	A-10 (Min. duration)
				Qualify HLW	315	315		A-10 (Min. Duration)
				Total duration	316	317		
6	3.2.1.4.4.a	High-Level Waste Batch Volume	tsd.3.4.2.F.14.1		7.13+04	1.45+05	gal	A-4 (Min & Max Batch Delivered)
7	3.2.1.2.1.c	Insoluble Waste Preparation - West Area Tanks	tsd.2.2.6.1.F.5		1	14	days	See Table 2
8	3.2.1.2.4.c	Insoluble Waste Preparation - East Area Tanks	tsd.2.2.6.1.F.6		1	13	days	A-10 (Min. Transfer Time)
9	3.2.1.2.7.a	Low-Activity Waste Staging Batch Volumes	tsd.2.2.6.F.6		2.80+05	1.01+06	gal	A-5 (Min & Max Batch Size)
10	3.2.1.2.a	Low-Activity Waste Staging Quantity, Phase I	tsd.2.2.6.F.6			10,500	MT	A-3 (Total Feed Delivered)
11	3.2.1.3.1.a	Low-Activity Waste Staging Batch Size, Phase I	tsd.2.2.6.F.6		2.80+05	1.01+06	gal	A-5 (Min & Max Batch Size) A-3 (Min & Max Batch Size)
					113	120	days	A-11 (Min. and Max Duration)
12	3.2.1.3.2.a	Low-Activity Waste Batches, Phase I	tsd.2.2.6.F.6		1.96+05	1.01+06	gal	A-3 (Min & Max Batch Size)
13	3.2.1.4.2.a	Sludge Wash Supernatant Total Volume	tsd.1.2.5.F.57			2.30+06	gal	A-12 (Transfer Volume)
14	3.2.1.4.2.b	Sludge Wash Supernatant Batch Volume	tsd.1.2.5.F.57		6.61+04	3.70+05	gal	A-12 (Min. and Max Transfer Volume)
15	3.2.1.2.1.b	Soluble Waste Preparation - West Area	tsd.2.2.6.1.F.5		82	118	days	A-15 (Up to First Decant)
16	3.2.1.2.4.b	Soluble Waste Preparation - East Area	tsd.2.2.6.1.F.7		10	117	days	A-13 (Up to Second Set of Decants)

Table A-7. Requirement Specific Derivations. (4 Sheets)

Req No	Paragraph	Title	HSTBD number	HSTBD description	Quantity associated with HSTBD number		Units	Reference table, location	
					Min	Max			
					17	3.2.1.2.b			Space Management Annual Waste Volume, Phase I
			tsd.1.2.5.F.17	AW-102 to Evaporator		4.36E+06	gal/yr	A-5 (Yearly max)	
			tsd.2.2.6.1.F.5	West DST to West DST		5.05E+06	gal/yr	A-5 (Yearly max)	
			tsd.1.2.5.1.F.30	West DST to East DST		3.88E+06	gal/yr	A-5 (Yearly max)	
			Total			2.31E+07	gal/yr		
18	3.2.1.2.1.a	Supernatant Preparation - West Area	tsd.2.2.6.1.F.5			NA	NA	See Table 2	
19	3.2.1.2.4.a	Supernatant Preparation - East Area	tsd.2.2.6.1.F.7			NA	NA	See Table 2	
20	3.2.3.10.a	Water - Phase I	Water	Water		1.30E+07	gal	A-5 (Total)	
21	3.2.1.4.d	High-Level Waste Feed Frequency, Phase I	tsd.3.4.2.F.14.1			200	295	days	A-4 (Process Time)
22	3.2.1.3.d	Low-Activity Waste Feed Frequency, Phase I	tsd.3.4.2.F.9			125	182	days	A-11 (Total Duration)
23	3.2.1.1.8.a	Treatment Plant Waste Product Volume, Phase I	tsd.1.2.5.1.F.11	AP-107 Returns		1.26E+05	gal/yr	A-5 (Yearly Max)	
24	3.2.1.1.3.a	204-AR Annual Capacity	tsd.1.2.5.F.2	100 Area		2.00E+05	gal/yr	A-5 (Yearly max)	
			tsd.1.2.5.F.7	300 Area		1.37E+05	gal/yr	A-5 (Yearly max)	
			tsd.1.2.5.1.F.8	T-Plant		5.60E+04	gal/yr	A-5 (Yearly max)	
			Total			3.93E+05	gal/yr		
25	3.2.1.1.3.b	204-AR Batch Transfer Capability	tsd.1.2.5.1.F.22			5,000	gal	See Table 2	
26	3.2.1.1.6.a	Annual Volume of Concentrated Waste	tsd.1.2.5.1.F.2			2.42E+06	gal/yr	A-5 (Yearly Max)	
27	3.2.3.4.a	B Plant/Waste Encapsulation and Storage Facility Waste Volume	tsd.1.2.5.F.69.1.3	WESF		1.00E+04	gal/yr	A-5 (Yearly Max)	
			tsd.1.2.5.F.69.2.2	B Plant		4.40E+04	gal/yr	A-5 (Yearly max)	
			Total			5.40E+04	gal/yr		
28	3.2.3.6.a	Concentrated Waste Received from the Evaporator	tsd.1.2.5.1.F.2			8.91E+05	gal	A-5 (Max Batch Size)	
29	3.2.1.1.5.a	East Area Liquid Waste Annual Capacity	tsd.1.2.5.F.2	100 Area		2.00E+05	gal/yr	A-5 (Yearly Max)	
			tsd.1.2.5.F.44	PUREX		1.00E+04	gal/yr	A-5 (Yearly Max)	
			tsd.1.2.5.F.69.1.3	WESF		1.00E+04	gal/yr	A-5 (Yearly Max)	
			tsd.1.2.5.F.69.2.2	B Plant		4.40E+04	gal/yr	A-5 (Yearly Max)	
			tsd.1.2.5.F.7	300 Area		1.37E+05	gal/yr	A-5 (Yearly Max)	

Table A-7. Requirement Specific Derivations. (4 Sheets)

Req No	Paragraph	Title	HSTBD number	HSTBD description	Quantity associated with HSTBD number		Units	Reference table, location
					Min	Max		
			tsd.2.F.1	SST Retrieval		2.57E+06	gal/yr	A-5 (Yearly Max)
			tsd.1.2.5.1.N.28E	Salt Well DN		1.86E+05	gal/yr	A-5 (Yearly Max)
			tsd.1.2.5.1.C.28E	Salt Well DC		7.75E+05	gal/yr	A-5 (Yearly Max)
			Total			3.94E+06	gal/yr	A-5 (Yearly Max)
30	3.2.3.5.b	East Single-Shell Tank Salt Well Liquid Waste Volume	tsd.1.2.5.1.N.28E	Salt Well DN		1.86E+05	gal	A-5 (Total)
			tsd.1.2.5.1.C.28E	Salt Well DC		9.16E+05	gal	A-5 (Total)
			Total			1.10E+06		
31	3.2.1.2.6.a	Evaporator Feed Annual Volume	tsd.1.2.5.F.17			4.36E+06	gal/yr	A-5 (Yearly Max)
32	3.2.1.2.6.b	Evaporator Feed Max Batch Size	tsd.1.2.5.F.17		3.50E+04	1.48E+06	gal	A-5 (Min & Max Batch Size)
33	3.2.1.2.c	Evaporator Feed Volume, Phase I	tsd.1.2.5.F.17			4.36E+06	gal/yr	A-5 (Yearly Max)
34	3.2.1.1.4.b	Waste Batch Size - West Area	di.wf.temp.217	222-S Lab	6.00E+03	3.70E+04	gal	A-5 (Min & Max Batch Size)
			tsd.2.F.2	SST Retrieval	1.16E+04	7.20E+05	gal	A-5 (Min & Max Batch Size)
			tsd.1.2.5.1.F.8	T-Plant	1.00E+03	5.40E+04	gal	A-5 (Min & Max Batch Size)
			tsd.1.2.5.F.40	PPP	3.00E+03	4.00E+03	gal	A-5 (Min & Max Batch Size)
			tsd.1.2.5.1.C.28W	Salt Well DN	1.40E+04	2.49E+05	gal	A-5 (Min & Max Batch Size)
			tsd.1.2.5.1.N.28W	Salt Well DC	8.30E+04	4.35E+05	gal	A-5 (Min & Max Batch Size)
			Bounds		1.00E+03	7.20E+05	gal	
35	3.2.1.1.5.b	Liquid Waste Batch Size - East Area	tsd.1.2.5.F.2	100 Area	2.00E+04	2.00E+05	gal	A-5 (Min & Max Batch Size)
			tsd.1.2.5.F.44	PUREX	5.00E+03	1.00E+04	gal	A-5 (Min & Max Batch Size)
			tsd.1.2.5.F.69.1.3	WESF	5.00E+03	1.00E+04	gal	A-5 (Min & Max Batch Size)
			tsd.1.2.5.F.69.2.2	B Plant	4.40E+04	4.40E+04	gal	A-5 (Min & Max Batch Size)
			tsd.1.2.5.F.7	300 Area	5.00E+04	1.37E+05	gal	A-5 (Min & Max Batch Size)
			tsd.1.2.5.1.N.28E	Salt Well DN	1.86E+05	1.86E+05	gal	A-5 (Min & Max Batch Size)
			tsd.1.2.5.1.C.28E	Salt Well DC	1.41E+05	7.75E+05	gal	A-5 (Min & Max Batch Size)
			Bounds		5.00E+03	7.75E+05	gal	
36	3.2.3.2.a	Plutonium Finishing Plant Waste Annual Volume	tsd.1.2.5.F.40	PPP		8.00E+03	gal/yr	A-5 (Yearly Max)
37	3.2.3.3.a	S Plant (222-S) Waste Volume	di.wf.temp.217	(222-S)		6.20E+04	gal/yr	A-5 (Yearly Max)
38	3.2.3.5.d	Verify Single-Shell Tank Waste Retrieval Volume, Phase I	tsd.2.F.1	East		5.30E+06	gal	A-5 (Total)
			tsd.2.F.2	West		2.48E+06	gal	A-5 (Total)

Table A-7. Requirement Specific Derivations. (4 Sheets)

Req No	Paragraph	Title	HSTBD number	HSTBD description	Quantity associated with HSTBD number		Units	Reference table, location
					Min	Max		
			Total			7.79E+06	gal	
39	3.2.1.1.4.a	West Area Liquid Waste Annual Capacity	di.wf.temp.217	222-S Lab		6.20E+04	gal/yr	A-5 (Yearly Max)
			tsd.2.F.2	SST Retrieval		1.53E+06	gal/yr	A-5 (Yearly Max)
			tsd.1.2.5.1.F.8	T-Plant		5.60E+04	gal/yr	A-5 (Yearly Max)
			tsd.1.2.5.F.40	PFP		8.00E+03	gal/yr	A-5 (Yearly Max)
			tsd.1.2.5.1.N.28W	Salt Well DN		1.59E+06	gal/yr	A-5 (Yearly Max)
			tsd.1.2.5.1.C.28W	Salt Well DC		7.19E+05	gal/yr	A-5 (Yearly Max)
			Total			3.96E+06	gal/yr	
40	3.2.3.5.a	Verify West Single-Shell Tank Salt Well Liquid Waste Volume	tsd.1.2.5.1.N.28W	Salt Well DN		2.52E+06	gal	A-5 (Total)
			tsd.1.2.5.1.C.28W	Salt Well DC		8.50E+05	gal	A-5 (Total)
			Total			3.37E+06	gal	

Table A-8. Cost Estimating Input Sheet.

SIB-Activity Task		Title: Perform Transfer from AP-102 to AP-106		Updated: Rev. 0	
TBR No.	150.B44	Date:	1/5/98	WBS No.	
Activity Owner	Tank Farm Operations	Sched. Act ID:	15B44B	Overall Duration:	See P-3 Logic Diagram
Prepared By:	T Bohan/V Mongar/M Lee	FDS WPTP No.		(PCT, MS, LOE) Earn Value Method:	

00,000 gallons of waste from AP-102 to the Vendor's tank AP-106. This transfer will use a transfer previously prepared in 130.B40.F1 saving approximately 4 weeks off the schedule. No mixing or settling is required prior to the transfer. Work performed in this activity includes prerequisites, transfer, and post transfer operations. Specific activities included in the prerequisites include Operator (NPO) review of the procedures, perform valve line-up and cover block checks with support from the Operating Engineer (1st line supervisor) and the Shift Manager. Transfer ops include transfer pump startup and instrument monitoring in the operations control building during the transfer. Post transfer ops include operator debriefing, Shift Manager/Operating Engineer reviews, the SOG Engineer review, and the QA record closeout of the transfer.

Estimating Assumptions/Exclusions/Risks:

1. W-314 delivers upgrade to master pump shutdown CKT which allows less field surveillance during transfer (currently takes up to 8 NPOs to do this).
2. No transfer equipment failures that add to cost, transfer EQ is maintained operable as base operations.
1. W-211 delivers transfer equipment to support transfer to/from AP-102/4/6/8.
1. No mixing or settling is required prior to transfer.
1. AP-102 and AP-104 cannot be done in parallel.
3. Tank AP-106 is flushed and empty. 7. Transfer procedure previously prepared in 130.B40.F1 can be used for this transfer.

Basis of Estimate:

Current practices, 100+ transfers per year.
 1) $700,000 \text{ gal} / 80 \text{ gpm} (7000 / 1440) \times 1.25 \text{ efficiency} = 7.59 \text{ days SAY } 8 \text{ days}$
 1. 2 NPO's x 2 shifts x 12 hrs x 8 days = 384
 1 OE x 2 shifts x 12 hrs x 8 days = 192
 2. Schedule duration allows for 2-days to perform prerequisites (review documentation, routing, valve lineups, etc.), 8-days to perform the actual transfer base on volume divided gallons per minute pumping capacity, and finally 1-day to do post ops transfer activities (re-align valves, debriefings, internal reporting, etc.).

Estimate Stage and Method:

A team of subject matter experts consisting of Management, Engineering/Operations staff were initially interviewed for an understanding of the activity scope and work process. Assumptions made on expected throughput and technical requirements are assumed or relatively unknown. Parametrics based on planning & process methodology unit rates for this work were used as the basis. THE ESTIMATE FOR THIS ACTIVITY IS CONSIDERED PRELIMINARY.

Reference Documents:

See Technical Basis Review document, section 2 "Reference Documents and Reports."

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Table A-8. Cost Estimating Input Sheet.

Sub-Activity/Task		Title: Perform Transfer from AP-102 to AP-106		Updated: Rev. 0	
TBR No.	150.B44	Date:	1/5/98	WBS No.:	
Activity Owner:	Tank Farm Operations	Sched. Act ID:	15B44B	Overall Duration:	See P-3 Logic Diagram
Prepared By:	T Bohan/V Mongar/M Lee	FDS WP/TP No.:		(PCT, MS, LOE) Earn Value Method:	
Notes:					
Note Number	Note Description				
1	700,000/80 (1/60 M x 24 Min.)(1.25 EFF) = 8 days				
2	Two 12 hour shifts for 8 consecutive days				
3	Efficiency factor of 1.25 to account for transfer shutdown (weather, equipment, etc.).				

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Table A-9. Pretreatment Processing Durations. (Taken from Table 3.2-3 of the TWRSO&UP)

Operation	Minimum duration per repetition	Maximum duration per repetition	Repetitions		
			241-AZ-101	241-AZ-102	241-AY-102/ 241-C-106
Decant Initial Supernatant ^a	1-2 days	30 days	1	1	1
Add wash solution ^a	1-2 days	30 days total	3	4	2
Mix waste with mixer pumps ^b	5 days (estimated)		3	4	2
Leach waste by mixing ^{b,c}	10 days (estimated)		1	1	1
Allow waste to settle	30 days	30 days	3	4	2
Sample and analyze solids and supernatant ^f	14 days	30 days total	3	4	2
Decant supernatant/wash solution ^a	1-2 days		3	4	2
Minimum total time ^d			161 days	214 days Max	108 days Min
Total allocated time (maximum total time) ^{d,e}			300 days	390 days	210 days

^aThe minimum durations for waste transfers are based on a 0.73 ML/day pump rate. The maximum durations for waste transfers are a conservatively high estimate to account for equipment failures, transfer conflicts, etc. (Certa et al. 1996).

^bActual mixing time will vary depending upon the results of the W-151 mixer pump test.

^cThis step is performed only if caustic leaching is required, and is not used for the "Base Case" schedule.

^dThe total minimum and maximum times include the initial decant step.

^eThe total allocated time should be used for planning purposes.

^fThis sampling and analysis required here is to verify the progress of the pretreatment process for a few critical waste components (e.g., aluminum, sulfate, sodium).

Table A-10. Feed Staging Durations for Tanks 241-AZ-101, 241-AZ-102, and 241-AY-102/241-C-106. (Taken from Table 3.2-4 of the TWRSO&UP)

Operation	Minimum duration	Allocated time
Add transfer solution ^a	1-2 days	10 days
Mix/sample/evaluate feed source, qualify waste form	315 days (estimated)	315 days
Transfer high-level waste batch to Privatization Contractor ^a	1 day	14 days
Total ^b	318 days	339 days

^aBased on a 0.73 ML/day pump rate.

^bSee Section 3.2.1.1 for discussion on how pretreatment and feed staging durations combine to determine a total duration.

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Table A-11. Feed Delivery Cycle Times.

Batch	Duration (days)
Batch 1, Envelope A Mobilize and Retrieve LAW from Source Tank Adjust Staged Feed As Required Feed Qualification	TOTAL 182 69 28 } 85 } 113
Batch 2, Envelope A Mobilize and Retrieve LAW from Source Tank Adjust Staged Feed As Required Feed Qualification	TOTAL 182 69 28 } 85 } 113
Batch 3, Envelope A Mobilize and Retrieve LAW from Source Tank Adjust Staged Feed As Required Feed Qualification	TOTAL 182 69 28 } 85 } 113
Batch 4, Envelope A Mobilize and Retrieve LAW from Source Tank Adjust Staged Feed As Required Feed Qualification	TOTAL 182 69 28 } 85 } 113
Batch 5, Envelope A Retrieve LAW from Source Tanks Adjust Staged Feed As Required Feed Qualification	TOTAL 142 22 35 } 85 } 120
Batch 6, Envelope B Retrieve LAW from Source Tank Adjust Staged Feed As Required Feed Qualification	TOTAL 123 10 28 } 85 } 113
Batch 7/8, Envelope C Retrieve LAW from Source Tank Note: this shortened duration requires feed qualification in the source tank prior to waste retrieval with mass balance correction for dilution in the staging tanks to establish basis for payment.	TOTAL 10 10
Batch 9, Envelope C Mobilize and Retrieve LAW from Source Tank Adjust Staged Feed As Required Feed Qualification	TOTAL 125 12 28 } 85 } 113
Batch 10, Envelope C Mobilize and Retrieve LAW from Source Tank Adjust Staged Feed As Required Feed Qualification	TOTAL 125 12 28 } 85 } 113
Batch 11, Envelope C Mobilize and Retrieve LAW from Intermediate Tank Adjust Staged Feed As Required Feed Qualification	TOTAL 122 9 28 } 85 } 113
Batch 12, Envelope C Mobilize and Retrieve LAW from Intermediate Tank Adjust Staged Feed As Required Feed Qualification	TOTAL 122 9 28 } 85 } 113

Note: This information extracted from the supporting documentation for the Tank Waste Remediation System Retrieval and Disposal Mission Initial Updated Baseline Summary (Swita 1998).

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Table A-12. Schedule for Phase I High-Level Waste Pretreatment and Feed Staging.
(Sheet 1 of 3) (Taken from Table 3.2-5 of the TWRSO&UP)

Activity description	Transfer volume (L)	Late start date	Duration (days)
"Bootstrap" Transfer Supporting AZ-101 Pretreatment			
1. Transfer AY-101 Supernatant to AP-106	3,200,000	8/30/00	30
Other Operations Supporting AZ-101 Pretreatment			
** Perform AZ-101 Mixer Pump Test		4/21/98	30
** Obtain Grab Samples of Sludge from AZ-101 for PHMC		5/21/98	14
2a. Complete AZ-101 In-Tank Evaporation to 5M Na	0	8/30/00	0
"Bootstrap" Transfer Supporting AZ-101 Pretreatment			
3. Transfer AZ-101 Supernatant to AY-101	2,400,000	8/30/00	30
AZ-101 Sludge Washing Operations			
4a. Add Wash Solution to AZ-101 and Mix Sludge	550,000	9/29/00	30
5a. Wait for Sludge to Settle in AZ-101		10/29/00	30
6a. Sample Sludge and Decant AZ-101 Supernatant to AW-105	600,000	11/28/00	30
4b. Add Wash Solution to AZ-101 and Mix Sludge	550,000	12/28/00	30
5b. Wait for Sludge to Settle in AZ-101		1/27/01	30
6b. Sample Sludge and Decant AZ-101 Supernatant to AW-105	520,000	2/26/01	30
4c. Add Wash Solution to AZ-101 and Mix Sludge	550,000	3/28/01	30
5c. Wait for Sludge to Settle in AZ-101		4/27/01	30
6c. Sample Sludge and Decant AZ-101 Supernatant to AW-105	540,000	5/27/01	30
AZ-101 Feed Staging Operations			
7. Add Transfer Solution to AZ-101	550,000	6/26/01	10
** Mix/Sample/Evaluate AZ-101 Sludge		7/6/01	70
** Take Representative Samples from AZ-101, Provide Them to the Privatization Contractor, and Wait for Waste Form Qualification		9/14/01	245
8a. Transfer AZ-101 Slurry to Privatization Contractor (Batch #1 48 MT NVOL, 59 MT NVO)	590,000	5/17/02	15
** Immobilize High-Level Waste Feed Batch #1		6/1/02	293
8b. Transfer AZ-101 Slurry to Privatization Contractor (Batch #2 48 MT NVOL, 59 MT NVO)	590,000	3/6/03	15
** Immobilize High-Level Waste Feed Batch #2		3/21/03	293

Table A-12. Schedule for Phase I High-Level Waste Pretreatment and Feed Staging.
(Sheet 2 of 3) (Taken from Table 3.2-5 of the TWRSO&UP)

Activity description	Transfer volume (L)	Late start date	Duration (days)
Other Operations Supporting AZ-102 Pretreatment			
** Obtain Core Samples from AZ-102 for PHMC		TBD	150
2b. Complete AZ-102 In-Tank Evaporation to 5M Na	1,700,000	1/8/02	0
"Bootstrap" Transfer Supporting AZ-102 Pretreatment			
9. Transfer AZ-102 Supernatant to AY-101 and AN-104	1,300,000	1/8/02	30
AZ-102 Sludge Washing Operations			
10a. Add Wash Solution to AZ-102 and Mix Sludge	810,000	2/7/02	30
11a. Wait for Sludge to Settle in AZ-102		3/9/02	30
12a. Sample Sludge and Decant AZ-102 Supernatant to AN-105	250,000 Min	4/8/02	30
10b. Add Wash Solution to AZ-102 and Mix Sludge	810,000	5/8/02	30
11b. Wait for Sludge to Settle in AZ-102		6/7/02	30
12b. Sample Sludge and Decant AZ-102 Supernatant to AN-105	780,000	7/7/02	30
10c. Add Wash Solution to AZ-102 and Mix Sludge	810,000	8/6/02	30
11c. Wait for Sludge to Settle in AZ-102		9/5/02	30
12c. Sample Sludge and Decant AZ-102 Supernatant to AN-105	790,000	10/5/02	30
10d. Add Wash Solution to AZ-102 and Mix Sludge	810,000	11/4/02	30
11d. Wait for Sludge to Settle in AZ-102		12/4/02	30
12d. Sample Sludge and Decant AZ-102 Supernatant to AN-105	800,000	1/3/03	30
AZ-102 Feed Staging Operations			
13. Add Transfer Solution to AZ-102	820,000	2/2/03	10
** Mix/Sample/Evaluate AZ-102 Sludge		2/12/03	70
** Take Representative Samples from AZ-102, Provide Them to the Privatization Contractor, and Wait for Waste Form Qualification		4/23/03	245
14a. Transfer AZ-102 Slurry to Privatization Contractor (Batch #3 - 40 MT NVOL, 45 MT NVO)	450,000	12/24/03	15
** Immobilize High-Level Waste Feed Batch #3		1/8/04	246
14b. Transfer AZ-102 Slurry to Privatization Contractor (Batch #4 - 40 MT NVOL, 45 MT NVO)	450,000	8/26/04	15
** Immobilize High-Level Waste Feed Batch #4		9/10/04	246
14c. Transfer AZ-102 Slurry to Privatization Contractor (Batch #5 - 40 MT NVOL, 45 MT NVO)	450,000	4/29/05	15
** Immobilize High-Level Waste Feed Batch #5		5/14/05	246
14d. Transfer AZ-102 Slurry to Privatization Contractor (Batch #6 - 40 MT NVOL, 45 MT NVO)	450,000	12/31/05	15
** Immobilize High-Level Waste Feed Batch #6		1/15/06	246

Table A-12. Schedule for Phase I High-Level Waste Pretreatment and Feed Staging.
(Sheet 3 of 3) (Taken from Table 3.2-5 of the TWRSO&UP)

Activity description	Transfer volume (L)	Late start date	Duration (days)
Other Operations Supporting AY-102 Pretreatment			
** Obtain Core Samples from AY-102 for PHMC		TBD	150
AY-102 Sludge Washing Operations			
15. Sample Sludge and Decant AY-102 Supernatant to AN-105	2,000,000	3/16/05	30
16a. Add Wash Solution to AY-102 and Mix Sludge	1,200,000	4/15/05	30
17a. Wait for Sludge to Settle in AY-102		5/15/05	30
18a. Sample Sludge and Decant AY-102 Supernatant to AN-105	1,400,000 Max	6/14/05	30
16b. Add Wash Solution to AY-102 and Mix Sludge	1,200,000	7/14/05	30
17b. Wait for Sludge to Settle in AY-102		8/13/05	30
18b. Sample Sludge and Decant AY-102 Supernatant to AN-105	1,200,000	9/12/05	30
AY-102 Feed Staging Operations			
19. Add Transfer Solution to AY-102	1,600,000	10/12/05	10
** Mix/Sample/Evaluate AY-102 Sludge		10/22/05	70
** Take Representative Samples from AY-102, Provide Them to the Privatization Contractor, and Wait for Waste Form Qualification		12/31/05	245
20a. Transfer AY-102 Slurry to Privatization Contractor (Batch #7 - 39 MT NVOL, 58 MT NVO)	580,000	9/2/06	15
** Immobilize High-Level Waste Feed Batch #7		9/17/06	236
20b. Transfer AY-102 Slurry to Privatization Contractor (Batch #8 - 39 MT NVOL, 58 MT NVO)	580,000	4/26/07	15
** Immobilize High-Level Waste Feed Batch #8		5/11/07	236
20c. Transfer AY-102 Slurry to Privatization Contractor (Batch #9 - 39 MT NVOL, 58 MT NVO)	580,000	12/18/07	15
** Immobilize High-Level Waste Feed Batch #9		1/2/08	236
20d. Transfer AY-102 Slurry to Privatization Contractor (Batch #10 - 39 MT NVOL, 58 MT NVO)	580,000	8/10/08	15
** Immobilize High-Level Waste Feed Batch #10		3/25/08	236
20e. Transfer AY-102 Slurry to Privatization Contractor (Batch #11 - 39 MT NVOL, 58 MT NVO)	580,000	4/3/09	15
** Immobilize High-Level Waste Feed Batch #11		4/18/09	236
** Complete High-Level Waste Immobilization (450 MT NVOL, 590 MT NVO)		12/10/09	0

NVOL = Non-Volatile Oxides Excluding Sodium and Silicon

NVO = Non-Volatile Oxides

General Notes:

- The activity numbers correspond to the illustration in Figure 3.4-11.
- Activities with no numbers (**) are not represented in Figure 3.4-11.
- The waste transfers shown in this schedule are based on conservative maximum durations, and may not correspond to the modeled schedule provided in Appendix H.

LAW Preparation and Staging Times

**Table A-13. Soluble Waste Preparation - East Area Tanks with Saltcake
(AN-103, AN-104, AN-105, AW-101).**

Calendar days	P3 schedule activity ID	Activity title
60	13B25B	Degas AN-105
2	13B30A	Add Diluent (~25 KGal)
6	13B30B2	Decant AN-105 to AP-102
6	13B30C2	Decant AN-105 to AP-104
5	13B30D	Add Diluent Water to AN-105
5	13B30E1	Operate Mixer Pumps in AN-105
3	13B30F	Perform Grab Sampling in AN-105
30	13B30G	Settle Solids in AN-105
8	13B30H	Decant waste from AN-105 to AP-102
8	13B30J	Decant waste from AN-105 to AP-104
133	TOTAL	

**Table A-14. Soluble Waste Preparation - East Area Tanks with Supernatant Retrieval Only
(AY-101, AN-107, AN-102, AN-106).**

Calendar days	P3 schedule activity ID	Activity title
10	13M30B	Transfer 800 KGal from AN-106 to AP-102
10	13M40B	Transfer 800 KGal from AN-106 to AP-104
20	TOTAL	

Table A-15. Soluble Waste Preparation - West Area Tanks
(SY-101, SY-103).

Calendar days	P3 schedule activity ID	Activity title
60	13R10B	Degas SY-101
4	13R30A	Add Diluent (~32 KGal)
8	13R30C	Decant 538 KGal from SY-101 to SY-102
8	13R30D	Add Diluent 500 KGal to SY-101
5	13R30E	Mix SY-101
3	13R30F	Perform Grab Sampling in SY-101 (12MAR06-14MAR06)
30	13R30G	Settle SY-101
8	13R30H	Decant SY-101 to SY-102 500 KGal
5	13R35B	Mix 102-SY
15	13R35C	Transfer 800 KGal from SY-102 to AN-102
9	13R40A	Decant 500 KGal from SY-101 to SY-102
5	13R50B	Mix 102-SY
15	13R50C	Transfer 800 KGal from SY-102 to AN-107
10	13R45B	Transfer 800 KGal from AN-102 to AP-102
10	13R55B	Transfer 800 KGal from AN-107 to AP-104
195	TOTAL	

The Blend/Qualify and Deliver Times for Staged LAW are the same for all batches except Batch 7 (AN-107). Batch 7 is qualified in the source tank prior to transfer to AP-102/AP-104.

Table A-16. Blend and Qualify Staged Low-Activity Waste.

Calendar days	P3 schedule activity ID	Activity title
5	15B42B	Perform AP-102 Mixing Operation
13	15B42C1	Obtain and Analyze Process Control Samples in AP-102
7	15B42E1	Prepare Process Memo for Mixing AP-102 (shown as 5 weekdays in P3)
3	15B42D	Blend & Shim to AP-102 Tank Chemistry
5	15B32B	Perform Batch Mixing Operation
5	15B34A	LAW AP-102 Feed Qual Grab Sample
22	15B38A	LAW AP-102 Analyze Feed Qual Sample
31	15B38B	LAW AP-102 Write/Issue Qual Sample Report (shown as 22 weekdays in P3)
15	150B40	Provide AN-105 Feed Batch Info from AP-102 to PC 1 (shown as 11 weekdays in P3)
106	TOTAL	

Table A-17. Transfer Low-Activity Waste Feed to Vendor Tanks.

Calendar days	P3 schedule activity ID	Activity title
9	15B44B	Deliver AN-105 Feed to AP-106
9	TOTAL	

Table A-18. RTP P3 Schedule.

MLL	ACT	TITLE	OD	ES	EF
130.B25	13B25A	Write Process Test Plan for Degas of AN-105	30	4DEC00	17JAN01
130.B25	13B25B	Degas AN-105 using Process Test Plan	60	3APR01	1JUN01
130.B30	13B30A	Add Diluent (~25 KGal) Decant Pump Recirc AN-105	2	7JUL01	8JUL01
130.B30	13B30B1	Write Procedure (Xfer) for AN-105 to AP-102	20	5MAR01	30MAR01
130.B30	13B30B2	Decant 250kgal From AN-105 to AP-102	6	9JUL01	14JUL01
130.B30	13B30C1	Write Procedure (Xfer) for AN-105 to AP-104	20	5MAR01	30MAR01
130.B30	13B30C2	Perform Xfer from AN-105 to AP-104	6	15JUL01	20JUL01
130.B30	13B30D	Add Diluent Water to AN-105	5	21JUL01	25JUL01
130.B30	13B30E	Prep Process Memo to Operate Mixer Pumps AN-105	5	25APR01	1MAY01
130.B30	13B30E1	Operate Mixer Pumps in AN-105	5	26JUL01	30JUL01
130.B30	13B30F	Perform Grab Sampling & Analysis of AN-105	3	31JUL01	2AUG01
130.B30	13B30G	Settle Solids in AN-105	30	3AUG01	1SEP01
130.B30	13B30H	Decant Waste from AN-105 to AP-102	8	2SEP01	9SEP01
130.B30	13B30J	Decant Waste from AN-105 to AP-104	8	10SEP01	17SEP01
130.M30	13M30A	Write Xfer Procedure for AN-106 to AP-102	20	28JUL06	24AUG06
130.M30	13M30B	Transfer 800 KGal from AN-106 to AP-102	10	25AUG06	3SEP06
130.M40	13M40A	Write Xfer Procedure for AN-106 to AP-104	20	20CT06	27OCT06
130.M40	13M40B	Transfer 800 KGal from AN-106 to AP-104	10	28OCT06	6NOV06
130.R10	13R10A	Write Process Test Plan for Degas of SY-101	30	30CT05	11NOV05
130.R10	13R10B	Degas SY-101 using Process Test Plan	60	17DEC05	14FEB06
130.R30	13R30A	Add Diluent .01m 32Kgal to SY-101	4	15FEB06	18FEB06
130.R30	13R30A1	Prepare Process Memo	5	4JAN06	10JAN06
130.R30	13R30B	Prepare Transfer Procedure	20	14DEC05	13JAN06
130.R30	13R30C	Decant 538 KGal from SY-101 to SY-102	8	19FEB06	26FEB06
130.R30	13R30D	Add Diluent 500 KGAL of .01m Caustic to SY-101	8	27FEB06	6MAR06
130.R30	13R30E	Mix SY-101	5	7MAR06	11MAR06
130.R30	13R30F	Perform Grab Sample & Analyze SY-101	18	12MAR06	29MAR06
130.R30	13R30G	Settle SY-101	30	15MAR06	13APR06
130.R30	13R30H	Decant SY-101 to SY-102 500 KGal	8	14APR06	21APR06
130.R35	13R35A	Write Xfer Procedure for 102-SY to 102-AN	20	27FEB06	24MAR06
130.R35	13R35B	Mix 102-SY with Process Memo from 13P50C	5	24APR06	28APR06
130.R35	13R35C	Transfer 800 KGal from 102-SY to 102-AN	15	29APR06	13MAY06
130.R40	13R40A	Decant 500 KGal from 101-SY to 102-SY	9	14MAY06	22MAY06
130.R45	13R45A	Write Xfer Procedure for 102-AN to 102-AP	20	26MAR07	20APR07
130.R45	13R45B	Transfer 800 KGal from 102-AN to 102-AP	10	21APR07	30APR07
130.R50	13R50A	Write Xfer Procedure for 102-SY to 107-AN	20	21MAR06	17APR06
130.R50	13R50B	Mix 102-SY with Process Memo from 13P50C	5	23MAY06	27MAY06
130.R50	13R50C	Transfer 800 KGal from 102-SY to 107-AN	15	28MAY06	11JUN06
130.R55	13R55A	Write Xfer Procedure for 107-AN to 104-AP	20	29MAY07	25JUN07
130.R55	13R55B	Transfer 800 KGal from 107-AN to 104-AP	10	26JUN07	5JUL07
150.B32	15B32A	Prepare (Process Memo) Batch Mixing Plan	5	2JUL01	9JUL01
150.B32	15B32B	Perform Batch Mixing Operations	5	10OCT01	14COT01
150.B34	15B34A	LAW AP-102 Feed Qual Grab Sample	5	15OCT01	19COT01
150.B34	15B34C	LAW AP-102/4 Update Feed Qual Grab Samp PM/TSAP	10	2JUL01	16JUL01
150.B34	15B34D	LAW AP-102 Updt Fd Ql Grab Samp Plan/Sch/Obt Mtl	22	28JUN01	30JUL01
150.B38	15B38A	LAW AP-102 Analyze Feed Qual Sample	22	20OCT01	10NOV01
150.B38	15B38B	LAW AP-102 Write/Issue Qual Sample Report	22	12NOV01	13DEC01
150.B38	15B38C	LAW AP-102 Prep Feed Qual Sample Lab Report	15	11NOV01	25NOV01
150.B40	15B40A	Draft Transmit Ltr Data to PC#1 AN-105/AP-102	2	14DEC01	17DEC01
150.B40	15B40B	Obtain LMHC Appr for Transmit Ltr AN-105/AP-102	5	18DEC01	27DEC01
150.B40	15B40C	FDH Transmit Data to DOE-RL AN-105/AP-102	2	28DEC01	31DEC01
150.B40	15B40D	DOE-RL Iss Trnsmt Ltr Data to PC#1 AN-105/AP-102	2	23JAN02	31JAN02
150.B42	15B42A	Prepare Process Memo for Mixing AP-102	5	4JUN01	8JUN01
150.B42	15B42B	Perform AP-102 Mixing Operation	5	10SEP01	14SEP01
150.B42	15B42C1	Obtain & Analyze Process Control Samps in AP-102	13	15SEP01	27SEP01
150.B42	15B42D	Blend & Shim to AP-102 Tank Chemistry	3	5OCT01	9OCT01
150.B42	15B42E1	Prepare Process Memo for Mixing AP-102	5	28SEP01	4COT01
150.B44	15B44B	Transfer 700Kgal from 102 AP to 106AP	9	4JAN02	12JAN02

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